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Driving Venture Capital Interest: The Influence of the Big 4 Audit Firms on IPOs

Manal Alidarous

Department of Accounting, College of Business Administration, Taif University, Taif City 26311, Saudi Arabia; mm.alidarous@tu.edu.sa

Abstract: This paper investigated how hiring one of the Big 4 auditing firms helps initial public offering (IPO) owners attract venture capitalists' (VCs) backing when going public to address the gap in auditing and venture capital literature. For this, the paper examined a large dataset from 1995 to 2019 consisting of 33,536 IPO firms from 22 countries with diverse socioeconomic, political, and cultural contexts. The study found that hiring Big 4 auditors increases IPO owners' chances of recruiting VCs by up to 50%. The analysis also supports prior findings, which state that IPO owners strategically choose Big 4 audit firms to lower agency costs and send quality signals to improve openness and disclosure as well as boost VCs' confidence in the IPO market. This research offers multiple benefits to academics, policymakers, investors, and issuers.

Keywords: Big 4 auditors; venture capitalists; signalling; agency cost; IPOs

1. Introduction

This study sought to fill a research gap in auditing and venture capital literature by investigating the impact of hiring one of the Big 4 auditing firms on helping initial public offering (IPO) owners to attract venture capitalists' (VCs) backing during their decision to go public. Research has confirmed that VCs are essential for guiding a firm towards a successful IPO (Amini et al. 2022; Copley et al. 2021). VCs supply the essential funding, strategic advice, and industry contacts that may assist companies in expanding quickly and reaching a point where they are prepared to become publicly traded (De Carvalho et al. 2020). Usually, they are long-term investors who are prepared to assist the firm throughout its development stages after the IPO, when the firm can encounter heightened scrutiny and expectations from public shareholders (Bernstein et al. 2017; Svetek 2022). Their ongoing support may contribute to stabilising the price of the company's shares and ensuring a smooth transfer to the public markets (Copley et al. 2021; Liu et al. 2021). Moreover, research also indicates that IPO owners are eager to attract VCs when they choose to become publicly traded (Amini et al. 2022; Liu et al. 2021). Nevertheless, the question is how IPO owners can attract VCs to participate when they decide to go public.

A thoughtful strategic move that IPO businesses may make to increase financial dependability, transparency, and reliability might involve hiring a reputable audit firm as part of the IPO process (Beatty 1989; Gao et al. 2011; Gompers et al. 2020), which could drive investor trust and have a positive influence over VCs' backing (Copley et al. 2021; Cumming and Johan 2008; De Carvalho et al. 2020). Auditing research suggests that the Big 4 audit firms, namely Deloitte, PricewaterhouseCoopers (PwC), Ernst & Young (EY), and KPMG, have a strong market reputation among IPOs in the auditing business (Agrawal and Cooper 2010; Beatty 1989; Gao et al. 2011; Joshi et al. 2022; Reiff and Tykvová 2021). They may play a significant role in attracting VCs to participate in an IPO. The Big 4 firms are renowned in the accounting and auditing industry for their proficiency in auditing, accounting, and consulting services (De Franco et al. 2011; Jacob et al. 2019); therefore, engaging a Big 4 audit firm while preparing for an IPO may improve the firm's

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financial legitimacy (Cohen and Dean 2005), transparency (Johl et al. 2021), and adherence to regulatory norms (Islam and Hossain 2017), making it more appealing to VCs. Moreover, an audit's clearance by the Big 4 may boost VC investors' faith in the firm's financial stability and reporting integrity (Colombo 2021). Engaging a Big 4 audit firm can also bring several advantages in drawing VCs to an IPO. For instance, choosing a Big 4 audit firm tells VCs that a business' financial statements have undergone a thorough examination and audit by a respected and impartial third party, thus increasing trust and confidence in the IPO prospectus (Connelly et al. 2011). Furthermore, the Big 4 audit firms are known for their strict audit procedures and compliance with audit standards (Lawrence et al. 2011), so engaging a Big 4 company allows IPOs to signal a dedication to financial openness and honesty (Jamaani and Alidarous 2022), which are crucial factors for VCs assessing investment prospects. Additionally, as VCs carefully evaluate investment risks (Kaiser et al. 2007a), the participation of a Big 4 audit firm may reduce risks associated with financial inaccuracies, fraud, and failure to meet regulatory standards (Khurana and Raman 2004), offering more confidence to VCs.

The correlation between engaging the Big 4 auditing firms and IPO companies has garnered significant scholarly interest because of the recent auditing scandals associated with IPOs (Abbott et al. 2023; De Franco et al. 2011; Sundarasen et al. 2021). This is because the frequency of auditing scandals involving IPOs has raised doubts about the effectiveness of audits carried out by major companies, such as the Big 4 (Chen et al. 2022; Toms and Lin 2023). For instance, Enron, an energy corporation, saw a substantial decline in 2001 after the exposure of its participation in widespread accounting fraud (Haswell and Evans 2018), and a prominent accounting firm by the name Arthur Andersen conducted an audit of Enron's IPO (Cahan et al. 2009). According to Gilson and Villalonga (2007), Adelphia Communications' collapse in 2002 was attributed to fraudulent accounting practices, and its founder and executives were convicted of fraud and securities fraud. Moreover, auditing company Deloitte & Touche settled litigation related to the issue by paying USD 167.5 million (CFO Magazine 2007). Furthermore, in 2009; Satyam Computer Services, a leading Indian IT company, admitted to a major accounting fraud (Bhasin 2013). Ramalinga Raju, the CEO and creator of the business, was sentenced to seven years in jail, whereas the accounting and auditing firm PwC was fined USD 6 million by Indian authorities (Reuters 2015). Additionally, in 2015, the Japanese international corporation Toshiba was involved in an accounting controversy where it was found that the firm had overstated its earnings by USD 1.2 billion over many years (Reuters 2015). Ernst & Young ShinNihon conducted an audit of the company's IPO as reported by Reuters (2015). Finally, Deliveroo's IPO in 2021 received significant investor backlash due to worries about the company's recruiting practices and valuation (Insider 2021), and PwC, the firm's auditor, received criticism for its role in the IPO (Alidarous 2024).

Indeed, audit scandals linked to IPOs have eroded trust in the accuracy and dependability of financial reporting, causing investors to be more cautious and sceptical when considering participation in IPOs (Agrawal and Cooper 2010; Petra and Spieler 2020). This growing scepticism has led to a more careful attitude towards IPO investments, with VCs increasingly demanding more extensive due diligence and stronger supervision (Beatty et al. 2013). The identification of financial misconduct, fraud, and significant inaccuracies in IPOs underscores the need for further examination of the relationship between Big 4 audit firms' involvement and the capacity of IPOs to attract VCs' backing. This need aims to understand how audit quality, accountability, and governance processes influence VCs' attitudes in the IPO market. Examining the impact of audit firm choice on IPOs' likelihood of VC backing can add to the auditing and venture capital literature by revealing the factors that affect VC confidence, risk evaluation, and IPO valuation (Amini et al. 2022; Beatty 1989; Certo et al. 2001; Chan et al. 2021; Firth and Liau-Tan 1998; Liu et al. 2021). Moreover, given the recent audit scandals and the shifting nature of the capital markets, understanding the relationship among VCs, the Big 4 audit firms, and the success of IPOs is of utmost importance for auditing and venture capital research (Agrawal and Cooper 2010; Petra and

Spieler 2020). The present study furthers previous auditing and venture capital research, which has solely focused on auditing quality and the involvement of VCs in IPO outcomes independently (Amini et al. 2022; Beatty 1989; Certo et al. 2001; Chan et al. 2021; Firth and Liau-Tan 1998; Liu et al. 2021). To the best of my knowledge, no study thus far has examined the role of the Big 4 auditing firms in improving IPO firms' ability to attract VCs; therefore, by addressing the research gap concerning this significant yet untested correlation, this paper can contribute to policy deliberations, regulatory adjustments, and optimal methodologies that seek to promote openness, responsibility, and safeguarding for investors in the IPO market.

This study used principal agent theory (PAT) and signalling theory (ST) to examine the link between the Big 4 audit companies and VC investors in the IPO market (Beatty 1989; Busenitz et al. 2005; Chan et al. 2021; Colombo 2021; De Carvalho et al. 2020; Kaplan and Strömberg 2001). A conventional IPO might include VCs (i.e., principals) backing and the firm's management team (i.e., agents) in return for ownership holdings (Liu et al. 2021). VCs rely on management to make decisions in the best interests of investors (Joshi et al. 2022). However, contrasting motivations between VCs and firm management might cause IPO conflicts of interest (Cumming and Johan 2008). For example, VCs emphasise profits on their investments and value information transparency, whereas firm management may prioritise personal benefit or corporate development (Gompers et al. 2020). Therefore, by hiring a Big 4 audit firm, IPOs could signal accountability, transparency, and good governance (Burke et al. 2019). This is because reputable audit firms such as the Big 4 can verify the firm's financial statements, internal controls, and accounting practices (Gao et al. 2011). The hiring of the Big 4 may reduce information asymmetry between VCs and corporate management, thereby lowering agency costs (Beatty 1989; Cumming and Johan 2008; DeFond 1992; Gao et al. 2011). VCs may also trust the audit report audited by the Big 4 firms to verify the company's accounting information in the IPO prospectus (Huang et al. 2020). Further, using a Big 4 auditing service may help align VC and corporate interests throughout the IPO process (Gompers 1995; Huang et al. 2020; Joshi et al. 2022; Liu et al. 2021). Additionally, the Big 4 auditing firms' strict audit processes and standards can signal to VCs that the company values corporate governance and financial integrity, while unbiased confirmation and certification from the Big 4 audit firms may enable VCs and business management to trust each other, thereby lowering agency expenses and any conflicts of interest (Arthurs and Busenitz 2003; Cumming and Johan 2008; Hope et al. 2012). Additionally, due to the transparent nature and scrutiny of Big 4 audits, VCs may become more interested in investment IPOs audited by the Big 4. Thus, the study hypothesis that renowned auditing service by the Big 4 firms may increase openness, reduce information asymmetry, and align stakeholder interests, making IPO businesses more appealing to VC investors. Consequently, investors' confidence and VCs flow are expected to increase when IPO companies hire Big 4 audit firms to review their financial statements and signal their commitment to good governance.

The study analysed 33,536 IPOs occurring between 1995 and 2019 in 22 countries with varied socioeconomic, legislative, and cultural backgrounds, and the results confirm that the hiring of the Big 4 auditors' firms significantly enhances the likelihood of IPO owners attracting VC participation by as much as 50% in the IPO market. The findings align with those of previous studies that suggest IPO owners strategically select Big 4 audit firms to reduce agency costs, improve transparency and disclosure, and enhance investor trust in the IPO market (Cumming and Johan 2008; Iatridis 2012; Jamaani and Alidarous 2022; Obeng et al. 2021). Moreover, IPO owners signal their commitment to robust governance practices, instil trust with VCs, and enhance their standing in the market through the utilisation of PAT and ST, which enhances their capacity to attract VC investments and achieve a successful IPO (Chan et al. 2021; Colombo 2021). External monitoring and assurance from the Big 4 auditing firms play a vital role in reducing information asymmetry, aligning the goals of VCs and business management, and fostering positive relationships that encourage VCs to participate in IPOs (Gompers 1995; Huang et al. 2020; Joshi et al. 2022; Liu et al. 2021).

The results of this study confirm that the utilisation of the PAT and ST can be an effective strategy for evaluating the influence of involving Big 4 audit firms in attracting VCs for IPOs. This is accomplished by transmitting a high-quality signal that minimises the costs associated with the relationship between IPO owners and VCs. It also strengthens the trust of VCs while simultaneously improving transparency and disclosure in the IPO prospectus.

This study makes valuable contributions to scholars, policymakers, investors, and issuers in several ways. First, this research contributes to auditing and venture capital research by enhancing the understanding of information asymmetry and signalling mechanisms in the IPO market. This study investigates how the hiring of an audit firm might impact VCs' investment choices in a company's IPO by contributing to prior research that has focused on auditing quality and the involvement of VCs in IPO outcomes independently (Amini et al. 2022; Beatty 1989; Certo et al. 2001; Chan et al. 2021; Firth and Liau-Tan 1998; Liu et al. 2021). Moreover, the research on information asymmetry and ST enhances auditing and venture capital literature focused on addressing the agency issue between agents (IPO firms) and principals (VCs). The PAT and ST in the IPO market elucidate the linkages and dynamics among important participants in the IPO process and could serve as an effective framework for researchers to comprehend the impact of engaging the Big 4 audit firms on recruiting VCs to IPO businesses. Thus, the study is timely, relevant, and important to scholars due to recent audit scandals that have caused concerns regarding audit quality and transparency in the IPO market. Second, policymakers can employ the findings to shape laws and regulations concerning auditing standards, corporate governance procedures, and investor protection in the IPO market. This study may emphasise the significance of accountability, transparency, and quality assurance in drawing VC investments and promoting IPO market integrity; therefore, legislators should explore ways to encourage corporations to choose trustworthy audit firms to boost VCs' trust and lower agency costs. Third, VCs and other investors may obtain insights by analysing how employing the Big 4 audit firms affects IPO businesses' capacity to seek investment. This study may assist investors in making better judgments by understanding the importance of quality auditing services and corporate governance standards offered by the Big 4 auditing firms when assessing possible investments in IPOs. Finally, IPO owners can leverage the findings of this study to strategically position themselves to appeal to VCs and other investors. Issuers may increase their likelihood of attracting investment and accomplishing successful IPOs by understanding the importance of employing the Big 4 audit firms to enhance transparency and credibility. This study may also assist issuers in adopting optimal strategies in financial reporting, company governance, and investor relations to establish confidence and credibility with prospective investors in the IPO market. Exploring the experiences of IPOs within the VC investment process through ST can enhance their ability to attract VC investments. Thus, comprehending the signals goes beyond mere recognition to interpreting them for the IPO owners' advantage, enhancing the IPO experience throughout the investment process.

The remainder of the paper is structured as follows: Section 2 provides an overview of the literature, which is followed by the development of theory and hypotheses in Section 3. Next, Sections 4 and 5 present the empirical results, data, and methods. Finally, Section 6 concludes the study.

2. Literature Review

2.1. The Relationship between VCs and IPOs

VCs, as defined by Busenitz et al. (2005), are a group of financial intermediaries who solicit capital from other investors to invest directly in new enterprises. In order to fully understand the appropriate correlation between VCs and IPOs, it is imperative to grasp the underlying reasons that prompt VCs to invest in IPOs in the first instance. VC firms may choose to invest in IPOs for several reasons. Firstly, this relationship may exist owing to the potential for substantial returns. VCs provide funds to invest in early-stage startups and rapidly expanding corporations, anticipating substantial financial gains from their

investments. VC firms may potentially achieve substantial returns by investing in IPOs, since they have the chance to benefit from the company's rising stock price after going public and therefore receive a share of its higher value. Research documents indicate that the average first-day return ranges from 27.7% to 43.90% in the global IPO market (Boulton et al. 2010; Zhang and Neupane 2024). Therefore, considering that venture capitalists invest in the early phases of an IPO business with discounted share prices, VCs may generate substantial returns at the debut of the IPO and in the post-IPO period when the firm's share prices spike on the secondary market a couple of years after trading. Secondly, this association may be attributed to the advantage of liquidity. VCs often adhere to a predetermined schedule for their investments and actively look for chances to divest their holdings in order to create liquidity for their investors (Nguyen and Vo 2021). Investing in an IPO enables VC companies to sell their ownership share in a business to the general public, allowing them to turn their investment into cash. Thirdly, this association may be attributed to the advantage of portfolio diversity. VCs oversee diverse portfolios of assets in order to distribute risk and optimize profits (Knill 2009). VC firms may diversify their portfolios by investing in IPOs, which involves adding publicly listed businesses to their existing private assets. Diversifying investments may effectively mitigate the overall risk of a portfolio and minimize exposure to a particular asset class or market sector (Knill 2009). Furthermore, this association may be attributed to the advantage of increased visibility and brand awareness. VCs frequently want to establish their credibility and draw in exceptional investment opportunities from entrepreneurs and companies (Joshi et al. 2022). Investing in well-known IPOs may enhance the prominence and reputation of VC companies in the market, demonstrating their history of successful investments and their ability to discover potential businesses (Joshi et al. 2022). Consequently, VC investors place a greater emphasis on early-stage ventures owing to the heightened expenses and uncertainties associated with investments (Drover et al. 2017), which distinguishes this form of VC financing from crowd fund (CF[1]) investment, private equity (PE[2]) investment, and angel investing (AI[3]) investment, where the latter three traditionally contribute their own funds to the former (Busenitz et al. 2004). Private company owners can secure substantial capital from the general public via IPOs (Jamaani and Alidarous 2019; Ritter and Welch 2002). However, an obstacle that IPOs encounter in securing this capital is the information asymmetry that exists between owners of IPOs and the investors in the IPO market (Jamaani and Alidarous 2019; Jamaani and Ahmed 2020). Prior research has demonstrated that the IPO market is characterised by substantial information uncertainty, which contributes to a high degree of information asymmetry and heightened susceptibility to earnings management (DuCharme et al. 2001; Jamaani and Alidarous 2022). The assessment of IPO firms' investment potential by investors and analysts becomes problematic due to the absence of historical trading records for the stock's price (Boulton et al. 2010). The exclusive source that provides information that analysts and investors can rely on to assess the quality of accounting information contained in business prospectuses is under the authority of the entity issuing the prospectus (Jamaani and Alidarous 2019). Additionally, the issue of informational investment uncertainty between the issuance and investors, including VCs, is further compounded by this exclusivity (Cohen and Dean 2005; Habib and Ljungqvist 2001; Jamaani and Ahmed 2020; Ritter 2013); consequently, VCs are compelled to depend on quality signals of IPO companies (Cohen and Dean 2005), which consist of particular attributes, approaches, judgments, or actions that serve as signs of the companies' prospects (Bergh et al. 2014; Colombo 2021).

By recognising the persistent agency issue between VCs (i.e., principals) and the IPO owner (i.e., agents) (Liu et al. 2021), the research on signals in IPO markets initially focused on the reliable signals of a company's scientific and engineering capabilities, such as intellectual property and product development metrics companies (Cohen and Dean 2005). The literature discussed the impact of venture officers on signalling, including managerial teams (Cohen and Dean 2005) and members of the board (Certo et al. 2001). Moreover, in current research, there has been a growing focus on the communication functions between

IPO owners and potential IPO investors such as VCs (Kaiser and Kuckertz 2023; Pollock et al. 2010). Business owners seek to persuade VCs, who are potential investors, of their company's qualities through the process of new-venture financing. VCs' decisions to invest are influenced by the receivers' judgment basis and the evidence they find relevant (Chen et al. 2009). Multiple studies have recognised and examined various signals for effectively transporting valuable information to VCs (Cohen and Dean 2005). In business literature, a distinction has been made between information signals, which communicate the potential success of a business, and interpersonal signals, which reflect the business owner's behaviour and capacity to cooperate with others (Huang and Knight 2017). Several factors play a crucial role in VC financing, including human capital, readiness, social capital, technological innovations, government funding, and affiliations with third parties such as hiring reputable underwriters and auditors (Colombo 2021; Sundarasen et al. 2018). Interpersonal signals in entrepreneurship include enthusiasm for the business (Chen et al. 2009), personal dedication to the venture (Busenitz et al. 2005), and the coachability of the business owner (Ciuchta et al. 2018). Furthermore, static signals like the entrepreneur's educational attainment and the company's market share offer investors insights into the potential returns on their investments (Colombo 2021). Notably, the findings of previous research highlight the impact of multiple variables on signalling power in VC financing (Bergh et al. 2014; Busenitz et al. 2005; Ciuchta et al. 2018; Cohen and Dean 2005).

The literature emphasises the importance of third-party affiliation in enhancing signalling effectiveness (Colombo 2021; Plummer et al. 2016). Signals such as human capital can be difficult for external investors to assess, leading to lower levels of attention (Zane 2023). Nevertheless, when associated with a reputable third party, the signal gains validation and reliability (Connelly et al. 2011). Plummer et al. (2016) demonstrated this effect by illustrating how being associated with a well-known investment organisation validates a business owner's assertions regarding their past managerial abilities, consequently confirming the organisation's positive reputation. Having a third-party affiliation can also enhance a product's market value and assist external investors in differentiating between poor-quality and top-notch ventures (Bergh et al. 2014). Plummer et al. (2016) also demonstrated empirical evidence supporting the assumption that the effectiveness of entrepreneurial commitment is enhanced by a third-party affiliation. Additionally, investors' significant status is a significant factor that acts as a form of certification, thus enhancing the trustworthiness of signals (Ko and McKelvie 2018). Thus far, scholars have explored various signals used by IPO firms to address the agency problem with VCs, aiming to minimise the information asymmetry gap and attract investment when going public. However, no study has investigated the connection between IPO owners hiring one of the Big 4 auditing firms and their ability to attract VCs.

2.2. Hiring Big 4 Auditors and IPO Audit Quality

Within publicly traded companies, the issue of whether Big 4 auditors provide better audit quality is being extensively researched (Alidarous 2024; Francis and Wang 2008; Gao et al. 2011; Huang et al. 2020; Khurana and Raman 2004). As per the theory proposed by DeAngelo (1981), Big 4 auditing companies are expected to provide higher audit quality due to their focus on reputation and increased independence compared to non-Big-4 auditors. The auditors for the Big 4 are becoming more concerned about legal action as they have a lot at stake because of their significant financial resources and the efforts put into building their reputation (Khurana and Raman 2004; Palmrose 1988). Along with this, Big 4 auditors are considered more efficient due to their larger size, which enables them to attract and retain higher-quality human resources (Gao et al. 2011). Research on publicly traded companies suggests that Big 4 auditing firms provide higher audit quality compared to non-Big-4 auditing firms (Becker et al. 1998; Defond et al. 2018).

With their significant experience in auditing, the Big 4 auditors might excel in auditing IPOs (Jamaani and Alidarous 2022; Jamaani and Alawadhi 2023). These auditors possess extensive global networks, consulting services, and a multitude of specialised regulations

specialists (Jacob et al. 2019). This information can assist in identifying audit alterations or anticipating and addressing Security Exchange Commission (SEC) accounting comments (Johnson et al. 2023). It should also be noted that the Big 4 auditing companies charge higher fees for IPO audits compared to the non-Big-4 auditors, which allows them to allocate more resources to these audits (Chan et al. 2021). Legal action related to IPOs and worries about reputation suggests that the Big 4 auditing companies are motivated to provide top-notch services (Gao et al. 2011; Khurana and Raman 2004). Due to the presence of lawsuit risk acts in many countries, IPO auditors need to have strong lawsuit motivation (Khurana and Raman 2004; Lin et al. 2013). Participating in IPO audits can offer significant financial benefits, the opportunity for ongoing work in the IPO sector, and increased visibility to potential clients, potentially enhancing the auditor's standing in the industry (Sundarasen et al. 2018).

During the IPO listing process, IPO companies typically hire an external auditor to conduct due diligence and validate financial statements in the prospectus before listing the company on the IPO market (Alidarous 2024; Beatty 1989; Jamaani and Alidarous 2022). Investors, including VCs, can carefully analyse the IPO prospectus to determine whether to invest in the IPO company or not (Chang et al. 2008; Copley et al. 2021). The inclusion of accounting and financial information in the prospectuses of company documents helps to minimise information disparities between IPO founders and shareholders including VCs (Masulis and Nahata 2009). The Big 4 audit reports play a crucial role in ensuring the authenticity and transparency of information provided, thereby supporting a healthy IPO market (Francis and Wang 2008). Studies have demonstrated that IPO investors rely on leading auditing firms, particularly the Big 4, for high-quality audits and ethical practices (Alidarous 2024; Khurana and Raman 2004; Lawrence et al. 2011).

Auditing companies' reputations are crucial for enhancing quality and minimising information asymmetry among investors and owners of IPO companies (Sundarasen et al. 2018). Moreover, audit firms such as the Big 4 play a crucial role in clarifying and reducing uncertainties about the accounting and financial data included in IPO prospectuses (Sundarasen et al. 2021). Investors prefer cautiously audited prospectuses because they perceive them as less hazardous, leading to reduced compensation for ex-ante uncertainty risk (Vinten 2005). This helps to decrease the information disparity between potential IPO shareholders and entrepreneurs (Wang and Song 2021). According to Beatty (1989) and Beatty et al. (2013), reputable auditing firms such as the Big 4 are anticipated to decrease the chances of fraudulent prospectuses, thereby maximising the possibility of successful IPO listing.

Furthermore, research confirms a correlation between engaging the services of the Big 4 auditing firms and reducing the underpricing of IPOs (Khurana and Raman 2004; Sundarasen et al. 2021). According to ST, signals can expose hidden qualities of owners, reducing information asymmetry between investors and issuers and increasing successful IPO offerings (Badru et al. 2019; Connelly et al. 2011; Welch 1989). Based on signalling research, the quality of the signal can impact the likelihood of agency problems between potential IPO investors such as VCs (i.e., principals) and the issuers of IPOs (i.e., agents) (Colombo 2021). Investors in IPOs rely on signals from the companies going public to guide their investment choices. Studies have demonstrated that engaging Big 4 audit firms can help establish credibility, especially when dealing with the risks associated with being a new player in the market (Certo et al. 2001; Certo 2003; Colombo 2021). Further, Big 4 auditors at an IPO may signal a company's strong auditing standards and reliable financial data (Burke et al. 2019).

2.3. Research Motivation

The literature on IPOs has predominantly examined the effects of Big 4 auditing firms on different aspects of IPOs, such as underpricing, long-term performance, withdrawal, and earnings management. Various studies (Alidarous 2024; Beatty 1989; Chen et al. 2005; Francis and Wang 2008; Jamaani and Alidarous 2022; Lee et al. 2006) have focused on

this topic and highlighted the numerous benefits associated with engaging Big 4 auditors. There is a lack of comprehensive knowledge on the impact of engaging auditors from the four largest accounting firms (Big 4) on the ability of IPO owners to attract VCs when they choose to make their company public. Therefore, this limited comprehension serves as the foundation for a strong research motivation to conduct a study that addresses a gap in the literature on auditing and venture capital. The study aims to examine the influence of engaging one of the Big 4 auditing firms on the ability of IPO owners to attract support from VCs when deciding to go public.

3. Theory and Hypothesis Development

This study utilised two theoretical models—namely, the PAT and ST—both of which offer important perspectives into how IPO owners employ the Big 4 audit firms to appeal to VCs (Beatty 1989; Busenitz et al. 2005; Chan et al. 2021; Colombo 2021; De Carvalho et al. 2020; Kaplan and Strömberg 2001). This is achieved by minimising agency costs, increasing transparency, boosting investor confidence, tackling information disparities, and signalling that the company is trustworthy to prospective investors. Moreover, PAT and ST can work together effectively to illustrate the significance of IPO firms hiring a Big 4 audit firm to appeal to VCs. By examining the interaction between the principal (i.e., VC) and the agent (i.e., IPO), PAT delves into concepts such as information asymmetry, monitoring, and control mechanisms (Chan et al. 2021; Gompers 1995). On the other hand, ST explores how the actions of the IPO firm can communicate important information to external parties such as VCs regarding its integrity, trustworthiness, and motives (Colombo 2021).

Some scholars have utilised PAT as a theoretical framework to explore the relationship between business owners and VCs in financial contracting, as demonstrated by Gompers (1995), Brav and Gompers (1997), and Kaplan and Strömberg (2001). According to Ross (1973), an agency connection is established when one party, known as the agent, represents or acts on behalf of another party, known as the principal, in a specific area of decision-making. It is common to perceive the VC as the principal and the business owner as the contracting agent in their relationship with one another (Gompers 1995). Notably, the VCs are not granted any personal advantages from control, while the business owner gains non-monetary benefits from establishing an autonomous company (Gompers 1995; Kaplan and Strömberg 2001). Due to the inability of the VC to directly measure the owner's level of effort, the dynamic of their relationship is affected by asymmetrical information, such as the business owner possessing greater information concerning the business compared to the VC (Cumming and Johan 2008). As a consequence, two issues could surface: (1) adverse selection, and (2) moral hazard (Kaiser et al. 2007b). Adverse selection is a result of asymmetrical information distribution (Kaiser et al. 2007b). For instance, in the dynamic between the VC and the business owner, the VC is unable to access the identical information as the business owner unless a formal agreement is established between them. Moral hazard is connected to adverse selection and arises due to challenges in monitoring the business owner's efforts (Kaiser et al. 2007b; Schnitzer and Watzinger 2022). Therefore, the VC cannot ensure that the business owner is acting optimally or if the business owner may be gaining personal advantages from undisclosed actions (Kaiser et al. 2007a, 2007b). These factors can negatively impact the VC and the collective reward, as referenced in Kaiser et al. (2007b). Here, the VC is likened to an external stakeholder who meticulously watches the firm to assess its business prospective and oversee the business owner's actions to guard against opportunism (Arthurs and Busenitz 2003).

To address the conflict that researchers face, three main solutions have been identified: pre-investment deal screening, structuring financial contracts, and post-investment monitoring (Kaplan and Strömberg 2001). In a study by Kaiser et al. (2007b), the PAT is illustrated through the agency relationship in VC finance. The study identifies three key connections, where the VC (a) employs monitoring tactics to address the business owner's information advantage, (b) seeks to influence the business owner's decisions, and (c) establishes a reward system to prevent the business owner from neglecting responsibilities.

Empirical studies have demonstrated the effectiveness of using these approaches as mitigation tools (Gompers 2022; Hallen et al. 2014). For instance, a study conducted by Kaplan and Strömberg (2001) showed that VCs strategically distribute various rights, such as cash flow, liquidation, and voting rights, as a crucial aspect of their financing deals. Moreover, numerous scholars have noted the significant utilisation of deal screening during the pre-investment stage (Gompers et al. 2020; Sharma 2015). It has also been established that the VC actively participates in post-investment monitoring and advising, frequently by joining the board or deploying the invested capital (Joshi et al. 2022; Sweeting and Wong 1997).

ST can serve as an invaluable instrument in addressing information asymmetry, as suggested by Bergh et al. (2014). ST is a commonly employed concept in auditing, business, and finance research across various applications (Badru et al. 2019; Connelly et al. 2011; Drover et al. 2018; Welch 1989; Yasar et al. 2020), which was once more employed when Zhang and Wiersema (2009) demonstrated how chief executives employ the quality of their financial statements as a signal to investors about the quality of their firm, consequently lowering the information disparity between executive management and investors. ST comprises three key components: the signaller, the signal, and the receiver (Connelly et al. 2011; Spence 2002). When there is asymmetry of information, the signaller (i.e., company owners) possesses more information than the other party, including external shareholders such as VCs. The parties will possess knowledge concerning the value they can add to each other, their capacity for impact, and their prospective quality (Svetek 2022; Taj 2016). Moreover, insiders with exclusive information, whether favourable or unfavourable, can influence perceptions of their credibility by providing signals about the information they possess (Connelly et al. 2011; Spence 2002). Signals refer to messages transmitted by one party to another to reduce information asymmetry and impact the situation in their favour (Svetek 2022; Taj 2016). These may vary in characteristics that set them apart, such as objectivity or subjectivity, positivity or negativity, complementarity or substitutability, absolute and relative cost, and signal flexibility (Svetek 2022).

Colombo (2021) pointed out that in the context of the relationship between the business owner and VC, research has predominantly focused on the business owner as the signaller and the VC as the receiver. This is because venture financing is perceived as the business owner's effort to convince VCs of their firm's qualities and its prospects for the future to attract potential investors (Taj 2016). Business owners offer various signals to VCs to demonstrate the quality of their ventures and assure VCs of having the appropriate team to achieve the vision (Colombo 2021). However, when there is information asymmetry favouring the business owner, Svetek (2022) identified firm- and individual-level signals for investors to evaluate. Signals at a firm level may consist of public funding, investments made by the business owner, previous funding from outside sources, affiliations and partnerships such as hiring reputable underwriters and auditors, and the number of trademarks or the quality of prototypes produced (Jamaani and Alidarous 2022; Sundarasen et al. 2018; Svetek 2022). The dedication of the founding team to a specific early-stage venture also serves as an indicator for prospective investors regarding the venture's potential (Bernstein et al. 2017). On an individual level, signals may consist of the individual's educational and professional background, personal social resources, and visible characteristics (Svetek 2022). Spence (2002) proposed that signals are costly in his influential work on ST. In simple terms, the signal transmitted by the more informed party must come at a cost to be effective[4] (Connelly et al. 2011; Sundarasen et al. 2018; Yasar et al. 2020). When examining the signals business owners convey to prospective investors, Huang and Knight (2017) identified two distinct kinds of signals: informational signals convey messages about the business owners' quality concerning various aspects such as preparedness, social capital, technological competency, government grants, and affiliations such as hiring reputable underwriters and auditors (Sundarasen et al. 2018), whereas interpersonal signals indicate the signaller's potential behaviour in interactions, including the business owner's passion, personal dedication to the venture, and flexibility to coaching (Colombo 2021).

The PAT and ST, therefore, are an important principle that applies to accounting, economics, and finance research, along with being frequently utilised in many situations such as the IPO market (Beatty 1989; Busenitz et al. 2005; Chan et al. 2021; Colombo 2021; De Carvalho et al. 2020; Kaplan and Strömberg 2001). The PAT and ST in the IPO market elucidate the linkages and dynamics among many stakeholders participating in the IPO process and could serve as an effective framework for comprehending the impact of engaging the Big 4 audit firms on recruiting VCs to IPO businesses via various means.

First, employing the Big 4 audit firms could potentially reduce agency costs (DeFond 1992; Hope et al. 2012; Iatridis 2012; Obeng et al. 2021). Agency costs in IPOs represent conflicts of interest and information asymmetry between VCs (i.e., principals) and IPO owners (i.e., agents) (Cumming and Johan 2008). Hiring a Big 4 auditing company allows the IPO firm to implement an external system for monitoring and supervision (Fan and Wong 2005). The thorough audit processes carried out by the Big 4 companies provide an impartial evaluation of the firm's financial statements and internal controls (Abid et al. 2018). Moreover, this external verification decreases the likelihood of agency costs resulting from opportunistic actions by business executives or falsification of accounting information, thus improving the trustworthiness and dependability of the financial disclosures in the IPO process (Huang et al. 2020). Furthermore, by enlisting a well-known Big 4 audit firm, IPO owners signal their dedication to transparency and strong corporate governance (Husnin et al. 2016; Jamaani and Alidarous 2022), which contributes to minimising agency costs by offering impartial confirmation that financial statements are trustworthy and precise, thereby lessening the information disparity between owners and prospective investors.

Second, engaging the Big 4 audit firms could enhance transparency and disclosure (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021). The Big 4 audit companies are renowned for their proficiency in financial reporting and commitment to professional standards (Lawrence et al. 2011), and by participating in the IPO preparation process, they guarantee that the firms' financial statements adhere to the accounting standards and are correctly presented (Chen et al. 2005; Jamaani and Alidarous 2022). VCs depend on the clarity and precision of accounting information to make well-informed investment choices (Joshi et al. 2022; Reiff and Tykvová 2021). The Big 4 audit firms' validation of the financial statements improves the quality of information accessible to venture capitalists, decreasing ambiguity and bolstering confidence in the companies' financial status and future potential (Gao et al. 2011; Jacob et al. 2019). Additionally, by enlisting the services of these companies, IPO owners signal a dedication to transparency and disclosure (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021). Thus, enhancing the credibility of financial information via the hiring of the Big 4 audit firms can help VCs make more informed investment decisions by reducing uncertainty and increasing transparency.

Third, hiring Big 4 audit firms can improve VCs' confidence (Chang et al. 2008; Khurana and Zhao 2019). VCs are experienced investors looking for attractive returns while also being cautious regarding the risks involved in funding startups (Gompers et al. 2020). A Big 4 audit company may indicate quality and dependability to prospective VCs (Copley et al. 2021). VCs perceive businesses audited by Big 4 firms as having been rigorously examined and carefully evaluated, which may inspire trust in the IPO firm's financial well-being and governance procedures (Lee and Masulis 2011). Investor trust is essential for securing VC investment in IPOs since VCs look for firms with solid foundations and clear operations (Amini et al. 2022; Copley et al. 2021; Liu et al. 2021). Further, external validation from the Big 4 audit firm may address doubts about the accuracy of financial information, thereby promoting VC participation in the company's IPO (Lee and Masulis 2011). Thus, by selecting a Big 4 audit firm, IPO owners signal their dedication to offering trustworthy financial information and enhancing investor trust in the business's future and leadership disclosure (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021). This may foster a deeper sense of confidence between IPO owners and VCs, thereby increasing the likelihood of VCs investing in the IPO.

In conclusion, IPO owners can strategically utilise the Big 4 audit firms to lower agency costs, boost transparency and disclosure, and increase confidence for VCs (Cumming and Johan 2008; Iatridis 2012; Obeng et al. 2021). Moreover, by utilising PAT and ST, IPO owners may signal their dedication to superior governance practices, establish confidence with VCs, and cultivate a favourable reputation in the market, eventually improving their ability to draw in investment and accomplish a successful IPO (Chan et al. 2021; Colombo 2021). Furthermore, the audit firm's external monitoring and assurance are crucial in decreasing information asymmetry, aligning the objectives of venture capitalists and business management, and promoting favourable relationships that support VC involvement in IPOs (Gompers 1995; Huang et al. 2020; Joshi et al. 2022; Liu et al. 2021). Based on the PAT and ST, this study posited the hypothesis that the involvement of the Big 4 audit firms in the IPO process has a positive impact on the appeal of a company to VCs, which is achieved through the promotion of transparency, mitigation of information asymmetry, and alignment of stakeholder interests. It is anticipated that IPO companies that retain the services of the Big 4 audit firms at the time of offering will signal their quality and enhance the credibility as well as dependability of their financial statements through external scrutiny and demonstration of dedication to sound governance. This, in turn, will likely bolster investor confidence and facilitate the inflow of venture capital to IPOs. Thus, the study examined the following hypothesis:

H1: *The hiring of the Big 4 auditing firms improves the ability of IPO firms to attract VCs in the IPO market.*

4. Data and Methodology

The study examined a large dataset consisting of 33,536 IPOs that took place between 1995 and 2019 across the Group of Twenty (G20) nations with diverse socioeconomic statuses, legislative frameworks, and cultural settings (Jamaani and Ahmed 2020; The World Bank 2016). These IPOs are from the G20 nations, which consist of Japan, South Korea, Indonesia, Saudi Arabia, France, Turkey, Italy, India, Argentina, Mexico, Canada, Australia, China, Germany, Japan, South Korea, Russia, South Africa, and the US (Ministry of External Affairs 2024). The G20 countries were chosen based on their large and varied dataset, which included a variety of national settings distinguished by unique legal systems, cultural norms, and economic structures (Jamaani and Ahmed 2020, 2022; The World Bank 2016). The research hypothesis was rigorously tested with the use of this selection of countries. Due to the G20 countries' significant influence on the course of the global economy, this group of nations is of particular interest to academics and professionals around the world (Jamaani and Ahmed 2020; Jamaani and Alawadhi 2023; Jamaani and Alidarous 2024). According to data from the International Monetary Fund (2022), since 1995; the G20 stock markets have contributed significantly to the global IPO market. Moreover, as per studies on IPO, the G20 nations accounted for nearly 81% of all IPOs registered globally up to 2019 (Jamaani and Ahmed 2020, 2022; Jamaani and Alidarous 2022, 2024; Jamaani and Alawadhi 2023). Furthermore, around 82% of the aggregate value of all companies that were registered was represented by these IPOs listed in the G20 countries (Jamaani and Alidarous 2022; Jamaani and Alawadhi 2023). As a result, analysing the G20 countries allows for a more thorough analysis of an entire dataset, which includes a variety of established and developing stock markets (Jamaani and Alidarous 2024). Notably, following IPO research (Alidarous 2024; Butler et al. 2014), I excluded American depositary receipts (ADRs), specific-purpose companies, rights offerings, mutual funds, and real estate investment trusts. For this study, I began the examination starting from the year 1995. The total count of IPOs that were listed in the G20 nations during the period from 1985 to 1995 was a mere 846. However, it is important to note that there is a substantial amount of missing information for the majority of variables included in the study for this time frame. The year 2019 is selected as the endpoint because it provides a substantial timeframe for

study that is not influenced by the COVID-19 pandemic and its subsequent repercussions (Zhang and Neupane 2024).

In the cross-sectional probit model, VC participation is denoted by the binary value y. If VCs participate, the value is 1; otherwise, it is 0. The fundamental model is represented by Equation (1), which is as follows:

$$P = Pr\,(y_j = /1\ x_j) = x'\beta \tag{1}$$

As Table 1 shows, $F(x'\beta)$ equals $x'\beta$ for the independent variables, including the main independent variable: the hiring of the Big 4 auditing firms. The employment of the Big 4 is represented by the binary variable y in the probit model. When a Big 4 auditing firm is employed, the assigned value is 1. To accommodate the nature of the binary dependent variable, I used a cross-sectional probit regression to examine the impact of Big 4 auditing firms on the capacity of IPO owners to attract VCs when companies choose to go public following previous research (Jamaani and Alawadhi 2023; Jamaani and Alidarous 2024; Tam et al. 2023). The cumulative distribution function for the standard normal distribution is $F(x'\beta)$, as represented by Equation (2), which is as follows:

$$F(x'\beta) \;=\; \Phi\,(x'\beta) \;=\; \int_{-\infty}^{x'\beta} \Phi(Z)dz \tag{2}$$

Table 1. Definitions and measurements of employed variables.

Variables	Description	Source of Data
	Dependent variable	
VC participation (VCP)	VC participation is denoted by the binary value y in the probit model. If VCs participate in the IPO, the value is 1; otherwise, it is 0.	Bloomberg Database (BD)
	Main variable	
The Big 4	The main binary independent variable is the Big 4 firms, which have a value of 1 if the IPO business hires one of Deloitte, PricewaterhouseCoopers, Ernst & Young, or KPMG at the time of offering and 0 otherwise.	BD
	Controlling variables	
	Accounting ratio characteristics	
Current ratio (CR)	It is a liquidity metric used to assess the adequacy of resources possessed by an IPO company to satisfy its immediate financial commitments at the moment of offering. It evaluates the relationship between a company's current assets and obligations.	BD
Asset to equity ratio (AER)	It is a liquidity ratio that assesses a company's leverage at the time of offering. It is computed by dividing the IPO firm's total assets by the equity held by shareholders.	BD
Return on common equity (ROE) ratio	It is a profitability ratio used to calculate the return on investment for common shareholders in IPOs. It is computed by taking the net income, or profits before interest and taxes, and dividing it by the average amount of common stock in the business at the time of offering.	BD
Dividend payout ratio (DPR)	It is a profitability ratio between the total dividends given to shareholders and the IPO company's net income. It represents the portion of profits distributed to shareholders as dividends at the time of offering.	BD

Table 1. *Cont.*

Variables	Description	Source of Data
	IPO firm characteristics	
Offer price (OP)	It represents the IPO firm's offering price, which is expressed in US dollars in the prospectuses.	BD
Offer size (OS)	It represents offering proceeds.	BD
Primary shares offered (PSO)	It shows the proportion of newly issued shares–created by IPO owners straight from the IPO–that is offered to IPO investors as a percentage of all outstanding shares.	BD
Secondary shares offered (SSO)	It denotes the proportion of the existing ownership stake held by IPO founders that is made available to IPO investors, relative to the total number of shares outstanding at the time of the offering.	BD
Underwriting fees (UF)	It denotes the proportion of fees requested by underwriters during the offering, calculated as a percentage of the total tola proceeds obtained from the offering.	BD
Integer (I)	It is a binary variable with a value of 1 in the event that the IPO company has an offer price with an integer value and a value of 0 in the event that the offer price has a fractional offer value at the time of offering.	BD
Price above the range (PAR)	It is a binary variable that has a value of 1 at the time of offering if the IPO businesses have an offer price that is higher than the range of offering price recommended by the underwriting bank; otherwise, it has a value of 0.	BD
Technology (T)	This variable is binary. It is set to 1 in the event that the IPO business is classified as a technology firm and to 0 for all other types of firms.	BD
Retail subscription ratio (RSR)	It represents the proportion of retail investors who have subscribed to the offering out of all the subscribers to the offering.	BD
	Corporate governance characteristics	
Audit committee meetings (ACM)	It represents the number of audit committee meetings that took place during initial IPOs.	BD
CEO duality (CEOD)	It is a binary variable that has a value of 1 if the chief operational officer (CEO) of the IPO company is also the chairman at the time of offering and 0 otherwise.	BD
Female on board of management (FOBD)	It represents the number of female directors present on the board of directors of the IPO firm at the time of offering.	BD
Independent directors on board of management (IDOBM)	It represents the number of independent directors present on the board of directors of the IPO firm at the time of offering.	BD
	IPO market characteristics	
Hot market (HM)	It is a binary variable that shows a value of 1 if an IPO occurs in a year with a listing volume that is above average and 0 otherwise.	The World Bank (TWB)
IPO volume (IPOV)	It represents the total number of IPOs that occur each year in each of the sample countries.	TWB
Pre stock market volatility (PSMV)	It shows the local stock market price index's standard deviation 15 days before the IPO offering data.	Calculated using DataStream
	Macroeconomic characteristics	
Inflation rate (IR)	It displays the average yearly inflation rate for every country between 1995 and 2019.	TWB
Foreign direct investment inflow (FDII)	It represents the yearly net inflows of foreign investment as a proportion of GDP between 1995 and 2019.	TWB

Table 1. *Cont.*

Variables	Description	Source of Data
Tax rate (TR)	It shows the annual business tax rate set by local governments between 1995 and 2019.	TWB
Gross Domestic Product (GDP)	It shows the GDP per capita increase per year for each of the countries in the study group from 1995 to 2019.	TWB
Common law English origin (CLEO)	This is a binary variable that takes the value of 1 if the IPO takes place in a common law English jurisdiction and the value of 0 otherwise. The US, UK, South Africa, and Australia retain the English common law heritage.	Lin et al. (2013)
Fixed effect dummies (FED)	It is a binary variable that adjusts for variations in the year-effect (YE), country-effect (CE), and industry-effect (IE).	Self-constructed variable
	Additional controlling variables for robustness testing	
Shadow economy (SE)	It is an annual measure that gauges the shadow economy of a nation, often known as the informal economy, underground economy, or black market. The shadow economy is not reported in official statistics and has been measured annually between 1995 and 2019. These activities generally entail unreported, untaxed, or unlawful transactions. Through a project that is commissioned by the International Monetary Fund (IMF), Medina and Schneider (2018) have extensively examined and established techniques to evaluate the size and dynamics of the shadow economy. Currency demand, power usage, and other indirect measures have been suggested for measuring the shadow economy in different nations. This approach estimates the size of the shadow economy using tax revenue, labour market, and other economic factors, and it is updated annually. Moreover, the data are publicly available through the IMF. Medina and Schneider (2018) note that the shadow economy may diminish tax revenues, skew economic data, and complicate government policy and regulation.	Medina and Schneider (2018)
Strength of auditing and reporting (SAR)	It is a set of annual statistics based on the weighted average of survey responses pertinent to the accounting question that is asked to respondents and covers the years 1995 through 2019. How strict are the requirements for financial reporting and audits in your nation? (1 = extreme inferiority; 7 = enormous power)	Global Competitiveness Report (2019)
Enforcement of securities regulation (ESR)	This is a dataset consisting of yearly data points that assess the enforcement of securities laws from 1995 to 2019. The index undertakes an analysis of annual advancements in global securities exchange regulation. The assessment of the efficacy of securities regulatory enforcement in a nation is measured on a scale ranging from 0 to 7.	Global Competitiveness Report (2019)
Rule of law (RL)	The dataset comprises yearly data points spanning from 1995 to 2019, assessing people's levels of belief and adherence to societal norms concerning property rights, contract enforcement, law enforcement, judicial systems, and crime and violence prevention.	Global Competitiveness Report (2019)
Control of corruption (CC)	The dataset consists of yearly data points spanning from 1995 to 2019. It quantifies the extent to which public authority is used for personal gain, covering both minor and major forms of corruption.	Global Competitiveness Report (2019)
Transparency of government policymaking (TGP)	The dataset consists of yearly data points spanning from 1995 to 2019. The transparency of government policymaking was assessed by calculating the average of the weighted scoring results obtained from a survey. This was achieved by posing the following question: To what extent may companies within your jurisdiction readily get information about changes in legislation that impact their operations? (1 = highly challenging; 7 = highly manageable)	Global Competitiveness Report (2019)

Table 1. *Cont.*

Variables	Description	Source of Data
Developing capital markets (DCM)	The variable is binary, with the value being 1 if the IPO business is listed in a developing nation and 0 if the IPO is listed in a developed country. Capital markets may be classified into two distinct categories, namely, developing and developed, as stated by Morgan Stanley Capital International (2020). The latter has a higher level of development in its capital markets. Based on IPO research, it has been observed that developing IPO markets demonstrate suboptimal resource allocation, less stringent regulatory frameworks, notable fluctuations in value, restricted variety within financial markets, and substantial information asymmetry when compared to developed ones (Jamaani and Alidarous 2022, 2024; Jamaani and Alawadhi 2023). Nations in the dataset, including Canada, the US, Australia, Germany, Denmark, Greece, France, Japan, the UK, Italy, South Africa, and Sweden, are considered to be part of developed capital markets. The set of developing capital markets includes Indonesia, Saudi Arabia, Turkey, South Korea, Brazil, Russia, China, India, Poland, and Mexico.	Self-constructed variable
Domestic market size (DMS)	The dataset comprises annual data points from 1995 to 2019, which provide an annual index assessing the total GDP and net imports of services and products. The index is standardised using a scale ranging from 1 to 7.	Global Competitiveness Report (2019)
Ethical behaviour of firms (EBF)	The dataset comprises annual data points reflecting the weighted average of opinion polls that address the following inquiry, covering the period from 1995 to 2019. How can one evaluate an organisation's corporate ethics in their nation, specifically in terms of their ethical interactions with government officials, political leaders, and other businesses? (1 = very impoverished and ranking among the lowest globally; 7 = exceptional and ranking among the highest)	Global Competitiveness Report (2019)
Gray's secrecy test (GST)	The dataset comprises time-invariant data points from 1995 to 2019, which are used to establish the financial secrecy rating using a technique created by Gray and Vint (1995). Financial secrecy may be calculated by adding uncertainty avoidance and power distance and then subtracting individuality using Hofstede (2001) cultural dimensions variables. When a country exhibits a high level of cultural secrecy, it is often associated with a high level of financial secrecy, and vice versa.	Gray and Vint (1995)
Prestigious underwriting banks (PUB)	The variable PUB is a binary indicator that distinguishes between IPOs underwritten by prestigious and non-prestigious underwriting banks. I replicate the binary variable "renowned underwriter" from IPO literature using the grading method created by Carter and Manaster (1990). According to Jamaani and Alidarous (2024), an underwriter company may be considered one of the top 100 worldwide licensed underwriters based on its market share in the Bangladeshi market. Alternatively, the value is 0.	BD

In order to avoid omitted variable bias, IPO research often controls for a variety of IPO-specific factors, particularly in cross-country testing research. Therefore, in accordance with earlier IPO research, I control for several aspects, including deal-related, accounting-related, market-related, and country-related factors (Alidarous 2024; Beatty 1989; Chang et al. 2008; Jamaani and Alidarous 2022; Lee and Masulis 2011). Table 1 offers detailed descriptions and reference measurements for each parameter included in the research.

5. Empirical Findings

5.1. Statistical Output

Table 2 presents the outcomes of the Pearson correlation matrix, which measures the linear association between variables. The variance inflation factor (VIF) test is used to verify the absence of multicollinearity in the employed regression models presented later in empirical results section. According to research by Cazavan-Jeny and Jeanjean (2007) and Premti and Smith (2020), if a regression model's mean VIF value is less than 5, multicollinearity between the independent variables is not present. The last round of empirical testing presents the mean VIF test for each model. The mean VIF value of each of these models is below the 5-point cut-off, indicating that there are no problems with multicollinearity in the models. The data indicate that the participation of VCs rises in correlation with the hiring of Big 4 auditors, technology-focused business, current ratio, IPO volume, percentage of primary and secondary shares sold, offer price exceeding the price range, retail subscription ratio, pre-IPO stock market volatility, COE duality, percentage of independent directors, presence of women on the board of directors, GDP growth, and tax rate. Moreover, this table also demonstrates that the involvement of VCs is inversely related to the asset-to-equity ratio, return on equity, dividend payout ratio, offer price, offer size, gross spread, integer offer price dummy, number of audit committee meetings, hot market periods, inflation rate, foreign direct investment inflow, and civil law origin.

Table 2 also presents a descriptive analysis of the examined dataset. Statistics indicate that the average VC participation rate in the sample is 7.50%, with the Big 4 auditing firms making up an average of 19.10% of companies preparing to go public. In addition, 3.50% of IPO owners sell their shares as secondary shares, whereas 22.70% sell them as primary shares. Approximately 11% of IPOs belong to the technology sector, with an average pre-IPO stock market volatility of 2%. Besides, the average underwriting fees amount to 3.70% of IPO proceeds. On average, 51 IPOs are listed annually, with 39% of them being launched during periods of high market growth. In the sample, the average number of independent directors is 8, and CEO duality is present in only 5.30% of IPOs. Upon listing, the average interest rate stands at 10.30%, with inflation at 2.60%. Further, on average, IPO proceeds amount to USD 108 million, with retail investors representing 94% of all IPOs.

Table 3 presents the distribution of VCs' precipitation and Big 4 auditors' hiring across different countries, years, and industries. China has the highest VC precipitation at 19.60%, whereas South Korea has the highest reported existence of Big 4 auditing firms at 43%. In 2015, the highest recorded the existence of Big 4 auditors was 23.90%, dropping to 14.40% in 2008. Similarly, the VC precipitation rate peaked at 12.10% in 2014, compared to a low rate of 4.10% in 2005. Within the consumer non-cy sector, the VC precipitation rate is 11.80%, compared to 1.40% in the fund sector. Additionally, the fund sector has a higher proportion of Big 4 auditors hiring at 57.70% than the 12.80% in the basic materials sector.

5.2. Regression Results

Table 4 presents the findings from seven distinct models, with Model 1 only incorporating the variable under investigation: the hiring of the Big 4 auditors. Models 2 to 7 entailed additional controlling variables to account for variations in industry, year, and country impacts, along with company-related, market-related, accounting-ratio-related, macroeconomics-related, and corporate-governance-related factors. The results related to the Big 4 variable, which examines the impact of hiring Big 4 auditors on the capacity of IPO owners to attract VC involvement, are consistent in all models. Model 1 indicates that the coefficient is statistically significant when the significance level is set at 1%, and hiring one of the Big 4 auditors significantly increases the likelihood of IPO owners attracting VC involvement by up to 50% throughout the whole IPO market. This confirms the correctness of the hypothesis. After adjusting for several factors such as company-related, market-related, accounting-ratio-related, macroeconomic-related, and corporate-governance-related variables in Models 2 to 7, the coefficients remain statistically significant at the 1% level, ranging from 29% to 33%.

Table 2. Pearson correlation matrix and descriptive statistics.

		Averages	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	VCP	0.07	1.00																										
2	The Big 4	0.19	0.12	1.00																									
3	CR	0.58	0.03	0.01	1.00																								
4	AER	0.32	0.01	0.01	0.01	1.00																							
5	ROE	−0.04	0.00	0.01	0.01	0.01	1.00																						
6	DPR	0.19	−0.01	0.01	0.01	0.01	0.01	1.00																					
7	OP	16.60	−0.02	−0.01	0.01	0.01	0.01	0.01	1.00																				
8	OS	108.00	−0.01	0.10	0.01	0.01	0.01	0.01	0.01	1.00																			
9	PSO	0.22	0.03	0.14	−0.01	0.01	0.01	0.01	−0.01	0.01	1.00																		
10	UF	0.04	−0.02	0.01	0.01	0.01	0.01	0.01	0.23	−0.01	−0.02	1.00																	
11	I	0.68	0.01	0.07	0.01	0.01	0.01	0.01	0.04	0.01	0.38	0.07	1.00																
12	PAR	0.03	0.07	0.11	0.01	0.01	0.01	0.02	0.01	0.01	0.21	−0.01	0.09	1.00															
13	T	0.11	0.02	0.01	0.01	−0.02	0.01	−0.01	0.02	−0.03	0.08	0.01	0.06	0.1.0	1.00														
14	RSR	0.95	0.25	−0.06	0.01	0.00	0.01	0.01	−0.01	−0.01	−0.11	−0.02	−0.20	−0.03	−0.01	1.00													
15	PSMV	0.02	0.09	0.05	−0.02	0.01	0.01	−0.01	0.01	0.03	0.03	−0.02	−0.01	0.03	0.03	0.10	1.00												
16	SSO	0.04	0.05	0.07	0.00	0.01	0.01	−0.01	−0.01	0.01	0.37	0.01	0.18	0.09	0.02	−0.02	0.03	1.00											
17	ACM	9.00	0.01	0.09	−0.01	0.01	0.01	0.01	0.07	0.12	0.07	0.09	0.09	0.04	0.01	−0.05	0.03	0.02	1.00										
18	CEOD	0.05	0.01	0.08	−0.01	0.01	0.01	0.01	0.07	0.04	0.07	0.08	0.08	0.03	0.01	−0.04	0.04	0.03	0.31	1.00									
19	FOBD	2.00	0.01	0.08	−0.01	0.01	0.01	0.01	0.01	0.14	0.03	−0.01	0.01	0.03	−0.03	−0.04	0.01	0.02	0.39	0.21	1.00								
20	IDOBM	8.00	0.04	0.16	−0.01	0.01	0.01	0.01	0.01	0.11	0.14	0.01	0.04	0.07	−0.01	−0.06	0.01	0.06	0.33	0.35	0.36	1.00							
21	HM	0.38	−0.11	−0.01	−0.02	0.00	−0.01	0.01	0.01	0.00	0.04	0.05	−0.02	0.01	−0.02	−0.12	−0.13	−0.04	0.04	0.04	0.03	0.05	1.00						
22	IPOV	51.00	0.01	−0.10	0.01	−0.02	0.01	0.01	0.01	−0.02	−0.22	0.01	−0.09	−0.06	−0.03	0.06	−0.13	−0.06	−0.02	−0.01	−0.02	−0.07	0.19	1.00					
23	IR	0.03	−0.02	−0.04	0.01	0.01	0.01	0.01	−0.09	0.00	−0.09	−0.13	−0.03	−0.01	−0.04	0.01	0.05	−0.12	−0.10	−0.10	0.01	0.01	0.14	0.09	1.00				
24	FDII	0.02	0.01	−0.05	0.01	0.01	−0.01	0.01	−0.08	0.01	−0.22	−0.13	−0.21	−0.04	−0.05	0.01	−0.05	−0.10	−0.14	−0.13	0.01	−0.02	0.06	0.01	0.12	1.00			
25	TR	0.53	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	−0.01	0.01	−0.02	0.01	0.01	−0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	−0.01	1.00		
26	GDP	0.03	0.10	−0.08	0.01	0.01	0.01	0.01	−0.04	0.03	−0.38	−0.07	−0.20	−0.06	−0.05	0.16	0.20	−0.06	−0.08	−0.06	0.04	−0.01	0.06	0.28	0.29	0.27	0.01	1.00	
27	CLEO	0.53	−0.05	0.05	−0.02	0.01	−0.01	0.01	−0.06	−0.04	0.36	−0.09	0.06	0.11	0.01	−0.15	−0.25	0.01	−0.03	−0.06	0.02	0.11	0.05	−0.18	0.04	0.15	−0.01	−0.31	1.00

Table 3. Statistical distributions of the dependent and main independent variables.

Industries	VCP	The Big 4	Countries	VCP	The Big 4	Years	VCP	The Big 4
Funds	1.4%	57.7%	Australia	0.7%	15.0%	1995	7.4%	21.2%
Financial	1.6%	23.9%	Brazil	3.4%	38.2%	1996	7.8%	21.2%
Basic Materials	3.7%	12.8%	Canada	0.8%	15.9%	1997	7.6%	19.8%
Energy	4.6%	18.7%	China	19.6%	14.3%	1998	7.0%	19.5%
Consumer cyclicals	5.0%	17.3%	Denmark	4.3%	17.4%	1999	5.6%	18.9%
Utilities	5.5%	19.1%	France	4.1%	2.5%	2000	5.6%	18.5%
Industrial	8.5%	15.1%	Germany	0.9%	2.9%	2001	4.3%	18.2%
Diversified	8.9%	16.2%	Greece	0.3%	6.3%	2002	4.8%	23.8%
Technology	9.1%	19.0%	India	1.7%	4.6%	2003	5.9%	19.7%
Communications	9.6%	17.5%	Indonesia	1.0%	3.3%	2004	5.8%	17.8%
Consumer non-cyclicals	11.8%	23.8%	Italy	1.0%	20.6%	2005	4.1%	18.9%
			Japan	2.8%	18.6%	2006	4.5%	18.1%
			Mexico	2.0%	10.3%	2007	4.9%	16.7%
			Poland	0.6%	1.7%	2008	4.9%	14.4%
			Russia	3.0%	16.2%	2009	9.4%	16.1%
			Saudi Arabia	3.0%	18.5%	2010	7.8%	18.4%
			South Africa	0.3%	11.5%	2011	7.2%	16.4%
			South Korea	3.5%	42.9%	2012	7.3%	20.4%
			Sweden	8.5%	17.6%	2013	7.6%	22.2%
			Turkey	0.3%	2.3%	2014	12.1%	20.7%
			United Kingdom	1.9%	13.2%	2015	10.8%	23.9%
			United States	11.2%	31.9%	2016	10.2%	18.6%
						2017	10.3%	17.1%
						2018	6.7%	18.3%
						2019	9.3%	19.1%

Table 4. Main regression testing. Model 1 is the basic model; Model 2 adds year-, industry-, and country-fixed effects; Model 3 adds accounting ratio characteristics; Model 4 adds IPO firm characteristics; Model 5 adds corporate governance characteristics; Model 6 adds IPO market characteristics; and Model 7 adds macroeconomic characteristics. The significance level for 0.10, 0.05, and 0.01 is represented by the symbols *, **, and ***, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Main independent variable							
The Big 4	0.50 ***	0.33 ***	0.29 ***	0.33 ***	0.29 ***	0.30 ***	0.33 ***
	[21.7]	[13.9]	[11.4]	[11.7]	[10.3]	[10.4]	[10.9]
Accounting ratio characteristics							
CR			0.010 **	0.012 ***	0.012 ***	0.012 ***	0.012 ***
			[2.25]	[3.88]	[3.97]	[3.95]	[3.28]
AER			−0.010	−0.010	−0.010	−0.010	−0.010
			[−0.46]	[−0.59]	[−0.64]	[−0.54]	[−1.05]
ROE			−0.010 *	−0.05	−0.012	−0.013	−0.017 **
			[−1.67]	[−0.98]	[−1.50]	[−1.40]	[−2.47]
DPR			−0.023	−0.036	−0.040	−0.042	−0.060
			[−1.49]	[−1.36]	[−1.40]	[−1.40]	[−1.44]
IPO firm characteristics							
OP				−0.015 ***	−0.013 ***	−0.013 ***	−0.017 ***
				[−3.71]	[−3.50]	[−3.48]	[−3.75]
OS				−0.018 ***	−0.021 ***	−0.021 ***	−0.024 ***
				[−3.19]	[−3.40]	[−3.37]	[−3.25]
PSO				0.025 ***	0.024 ***	0.020 ***	0.036 ***
				[14.4]	[13.6]	[14.2]	[15.9]

Table 4. *Cont.*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
SSO				0.040 ***	0.034 ***	0.034 ***	0.025 ***
				[8.43]	[8.36]	[8.10]	[4.44]
UF				0.020 ***	0.017 ***	0.017 ***	0.023 ***
				[3.87]	[3.64]	[3.63]	[4.01]
I				0.24 ***	0.25 ***	0.25 ***	0.26 ***
				[7.08]	[7.25]	[7.25]	[7.27]
PAR				0.55 ***	0.54 ***	0.53 ***	0.49 ***
				[9.67]	[9.33]	[9.30]	[8.47]
T				0.17 ***	0.17 ***	0.17 ***	0.15 ***
				[3.67]	[3.64]	[3.59]	[3.13]
RSR				0.024 ***	0.025 ***	0.025 ***	0.022 ***
				[18.3]	[18.4]	[18.3]	[16.6]
Corporate governance characteristics							
ACM					−0.019 ***	−0.020 ***	−0.014 **
					[−2.80]	[−2.95]	[−1.98]
COED					−0.050	−0.055	−0.056
					[−0.84]	[−0.92]	[−0.95]
FOBD					−0.045 **	−0.046 **	−0.050 **
					[−2.01]	[−2.03]	[−2.23]
IDOBM					0.068 ***	0.069 ***	0.063 ***
					[8.82]	[8.93]	[7.64]
IPO market characteristics							
HM						−0.023	−0.092 **
						[−0.67]	[−2.43]
IPOV						0.022 ***	−0.022 **
						[3.12]	[−2.41]
PSMV						0.19 ***	0.12 ***
						[11.4]	[6.62]
Macroeconomic characteristics							
IR							−0.052 ***
							[−5.29]
FDII							0.024 **
							[1.99]
TR							0.010
							[0.87]
GDP							0.11 ***
							[16.2]
CLEO							−0.18 ***
							[−4.76]
FED		YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE
Constant	−1.60 ***	−2.78 ***	−2.74 ***	−3.45 ***	−3.51 ***	−3.53 ***	−4.08 ***
	[−128]	[−61.3]	[−52.8]	[−46.0]	[−46.0]	[−41.4]	[−33.1]
Observations	33,536	33,536	27,183	27,182	27,182	27,182	27,182
Adjusted R^2	0.026	0.12	0.13	0.20	0.21	0.21	0.23
Mean VIF value	1.1	1.2	1.32	1.42	1.47	1.48	1.56

5.3. Discussion of Results

The results align with previous findings, which revealed that IPO owners strategically choose Big 4 audit firms to reduce agency costs, enhance transparency and disclosure, and improve investor trust in the IPO market (Cumming and Johan 2008; Iatridis 2012; Jamaani and Alidarous 2022; Obeng et al. 2021). By using PAT and ST, IPO owners signal their commitment to high governance standards, build trust with VCs, and enhance their image in the market, ultimately increasing their capacity to attract investment and achieve

a successful IPO (Chan et al. 2021; Colombo 2021). External monitoring and assurance by the Big 4 audit firms are also essential for reducing information disparities, along with fostering positive relationships that encourage VC participation in IPOs, aligning the goals of VCs and business management (Gompers 1995; Huang et al. 2020; Joshi et al. 2022; Liu et al. 2021).

The findings also indicate that the PAT and ST in the IPO market reveal the connections and changes among various parties involved in the IPO procedure (Beatty 1989; Busenitz et al. 2005; Chan et al. 2021; Colombo 2021; De Carvalho et al. 2020; Kaplan and Strömberg 2001). Furthermore, the results confirm that the PAT and ST might be used effectively to examine how hiring Big 4 audit firms influences the attraction of VCs for IPOs via three channels.

First, Big 4 audit firms may lower agency costs (DeFond 1992; Hope et al. 2012; Iatridis 2012; Obeng et al. 2021). IPO agency costs comprise conflicts of interest and information asymmetry between VCs (i.e., principals) and IPO owners (i.e., agents) (Cumming and Johan 2008). The IPO firm may build an external monitoring and supervision system by hiring a Big 4 auditing firm (Fan and Wong 2005), as Big 4 audits provide an objective assessment of the company's financial statements and internal controls (Abid et al. 2018). External verification reduces agency costs from firm management opportunistic activities or accounting information manipulation, making IPO financial disclosures more trustworthy (Huang et al. 2020). IPO owners signal their commitment to transparency and corporate governance by hiring a Big 4 audit firm (Husnin et al. 2016; Jamaani and Alidarous 2022). Offering unbiased assurance that financial statements are trustworthy and exact reduces agency costs by reducing the knowledge gap between IPO owners and potential VCs.

Second, hiring Big 4 audit firms may improve transparency and disclosure (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021) as they are known for their financial reporting skills and professionalism (Lawrence et al. 2011). They also ensure that the company's financial statements meet accounting standards and are properly presented by participating in IPO preparation. VCs need clear and accurate accounting data to make informed investment decisions (Joshi et al. 2022; Reiff and Tykvová 2021), and they tend to have more trust in the company's financial position and prospects when the Big 4 audit firm validates the financial statements (Gao et al. 2011; Jacob et al. 2019). Thus, IPO owners signal transparency and disclosure by hiring Big 4 audit firms to improve financial information credibility, which may help VCs make better investment choices by decreasing uncertainty and boosting transparency (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021).

Finally, hiring Big 4 audit firms may boost VC confidence (Chang et al. 2008; Khurana and Zhao 2019). As VCs are highly experienced investors who seek high profits while minimising startup risks (Gompers et al. 2020), a reputable Big 4 audit firm may reassure potential VCs (Copley et al. 2021). Big 4 audits can also strengthen VCs' confidence in the IPO firm's financial health and governance (Lee and Masulis 2011). IPOs need investor confidence since VCs prefer startups with strong foundations and transparent operations (Amini et al. 2022; Copley et al. 2021; Liu et al. 2021). Financial information may be verified by the Big 4 audit firm, thus encouraging VC involvement in the company's IPO (Lee and Masulis 2011). IPO owners choose a Big 4 audit firm to signal their commitment to providing reliable financial information and building investor confidence in the business's future and leadership (Chen et al. 2022; Francis and Wang 2008; Johl et al. 2021).

5.4. Tests for Robustness

Literature suggests that variations in the formal and informal institutional settings of a country may impact the role of intermediaries such as the Big 4 auditing firms and VCs in equity markets (Aggarwal and Goodell 2009; Alidarous 2024; Jamaani and Alidarous 2021; Jamaani and Ahmed 2022; Khurana and Raman 2004). Scholars have argued that the influence of reputable intermediaries such as the Big 4 auditing firms and VCs on the success of IPOs can differ based on factors such as economic development, stock

market development, accounting expertise, ethical business practices, legal frameworks, and cultural environments at the national level.

Previous studies have argued that countries with weak (or strong) stock market development, economic development, accounting profession, ethical business behaviour, law enforcement, and cultural environments tend to have less (or more) sophisticated investors and equity markets, lower (or higher) corporate governance standards and compliance, weaker (or stricter) investor protection and legal structures, and fewer (or more limited) government interventions (Hope 2003; Jamaani and Alidarous 2021, 2024; Jamaani and Ahmed 2022; Jamaani and Alawadhi 2023; Sundarasen et al. 2018, 2021). As a result, the role of well-established intermediaries such as the Big 4 can vary due to anticipated conflicts of interest and information imbalances between VCs (i.e., principals) and IPO owners (i.e., agents) in the global IPO market.

I validated the hypothesis by examining variations in the level of the stock market and economic advancements. This was achieved by factoring in four variables, which included disparities in developed and developing equity markets, the size of the domestic market, the extent of enforcement of security market regulations, and the existence of a shadow economy in the countries I analysed following previous literature (Hope 2003; Jamaani and Alidarous 2021, 2024; Jamaani and Ahmed 2022; Jamaani and Alawadhi 2023; Sundarasen et al. 2018, 2021). Controlling for variations across nations in the level of the strength of auditing and reporting standards and ethical behaviour of businesses has the additional effect of capturing the level of the accounting profession as well as the degree of business ethics, respectively (Hope 2003; Jamaani and Alidarous 2021, 2024; Jamaani and Ahmed 2022; Jamaani and Alawadhi 2023; Sundarasen et al. 2018, 2021). By adjusting for variations across nations in the degree of rule of law and control of corruption, it is possible to capture disparities in the legal system (Jamaani and Alidarous 2021; Jamaani et al. 2022). Finally, the financial secrecy index, which was established by Gray (1988) to account for variations in cultural secrecy, was used to capture the disparities in the cultural setting (Jamaani et al. 2021).

The findings from Models 4–22 consistently support and reaffirm the research hypothesis. The findings regarding the Big 4 variable, which concerns the influence of hiring Big 4 auditors on the ability of IPO owners to attract VC involvement, were consistently observed across all models. Moreover, all models collectively show that the coefficients are statistically significant when the significance level is set at 1%. Engaging the services of the Big 4 auditors greatly enhances the chances of IPO owners attracting VC participation in the IPO market. This positive effect remains consistent even when accounting for various factors such as economic development, stock market development, accounting expertise, ethical business practices, legal frameworks, and cultural environments at the national level.

A last robustness test was carried out to address potential endogeneity in the model. I evaluated endogeneity by utilising the Habib and Ljungqvist (2001) method and the Hausman (1978) endogeneity test. Furthermore, I employed the two-stage least squares (2SLS) method of estimation with robust standard errors to investigate the potential endogeneity issue between the decision of IPO owners to employ a reputable underwriter and the error terms when IPO issuers choose one of the Big 4 auditing firms during the offering. Previous studies on IPOs have shown that the accuracy of study results might be affected by the potential existence of endogeneity in the probit regression model (Jamaani and Ahmed 2020; Jamaani and Alidarous 2021). Furthermore, Jamaani and Alidarous (2021) discovered that the selection of reputable or non-reputable underwriting companies in IPOs may have been influenced by external factors, thereby causing a biased regression analysis. Endogeneity implies that IPO owners may attract VCs by engaging prestigious underwriting firms, even without the help of Big 4 auditing firms. If insignificant results are achieved for the variable Big 4 after accounting for endogeneity, it indicates that the endogenous decision made by IPO owners to engage reputable underwriting banks is responsible for attracting the participation of VCs, with no help from the Big 4 auditing firms in enhancing the ability of IPO owners to attract VCs.

According to Sanderson and Windmeijer (2016), research must utilize a robust instrumental variable (IV) to reduce the possibility of endogeneity and prevent the development of an identical bias that may result from using a weak IV. According to Hausman (1978), a robustness indicator is an instrument that shows a significant correlation with the discovered endogenous part but does not show any correlation with error terms. The use of weak instruments has piqued the attention of researchers (Cameron and Miller 2015). Regarding the best instruments to use, there is barely any agreement in the IPO literature. Return on assets and profits per share are used by Habib and Ljungqvist (2001) and Alavi et al. (2008), while total proceeds and the number of IPO companies are used by Chahine (2008) and Jones and Swaleheen (2010), respectively. I use IV in accordance with Jamaani and Ahmed (2021), which is calculated by dividing the percentage of the average proceeds from all underwritten IPOs by the total number of IPOs that each underwriter has underwritten in that specific nation. Reputable underwriters often oversee a sizable number of IPOs while maintaining their dominating position in the IPO market, which is the justification for using this IV (Jamaani and Ahmed 2021). I use a weak instrument test following Boulton et al. (2017), improving upon the work of Cragg and Donald (1993), in order to assess the robustness of the chosen IV. This test's null hypothesis is that the instrument is weak. In Table 5, Model 11 consistently shows that the coefficient of the Big 4 is statistically significant at a 1% significance level. Hence, hiring the Big 4 auditors significantly increases the likelihood of IPO owners receiving VC investment in the IPO market by 26%, even when considering endogeneity issues using 2SLS estimation.

Table 5. Robustness testing. Model 1 controls for SE; Model 2 controls for SAR; Model 3 controls for ESR; Model 4 controls for RL; Model 5 controls for CC; Model 6 controls for TPG; Model 7 controls for DCM; Model 8 controls for DMC; Model 9 controls for EBF; Model 10 controls for GST; and Model 11 controls for PUB using 2SLS to control endogeneity. The significance level for 0.10, 0.05, and 0.01 is represented by the symbols *, **, and ***, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
Main independent variable											
The Big 4	0.31 *** [9.1]	0.34 *** [10.7]	0.33 *** [10.9]	0.34 *** [11.0]	0.34 *** [11.0]	0.33 *** [10.8]	0.34 *** [11.0]	0.34 *** [11.1]	0.34 *** [11.0]	0.34 *** [11.0]	0.24 *** [7.72]
Accounting ratio characteristics											
CR	0.02 *** [3.60]	0.012 *** [4.60]	0.013 *** [3.31]	0.016 *** [3.36]	0.017 *** [3.59]	0.016 *** [3.35]	0.019 *** [3.47]	0.017 *** [3.66]	0.018 *** [3.36]	0.061 *** [3.38]	0.076 *** [3.78]
AER	−0.012 [−0.44]	−0.010 [−0.43]	−0.018 [−1.03]	−0.018 [−1.03]	−0.017 [−0.97]	−0.018 [−1.03]	−0.017 [−0.99]	−0.015 [−0.85]	−0.018 [−1.03]	−0.018 [−1.12]	−0.015 [−0.90]
ROE	−0.018 **	−0.016 **	−0.017 **	−0.017 **	−0.016 **	−0.016 **	−0.016 **	−0.017 **	−0.017 **	−0.018 ***	−0.020 ***
	[−2.19]	[−2.09]	[−2.46]	[−2.46]	[−2.37]	[−2.40]	[−2.39]	[−2.55]	[−2.46]	[−2.61]	[−2.90]
DPR	−0.060 [−1.40]	−0.063 [−1.42]	−0.060 [−1.44]	−0.060 [−1.45]	−0.060 [−1.47]	−0.060 [−1.45]	−0.060 [−1.47]	−0.063 [−1.48]	−0.060 [−1.45]	−0.066 [−1.41]	−0.074 [−1.54]
IPO firm characteristics											
OP	−0.010 *	−0.010 *	−0.017 ***	−0.016 ***	−0.015 ***	−0.016 ***	−0.015 ***	−0.015 ***	−0.016 ***	−0.014 ***	−0.015 ***
	[−1.98]	[−1.96]	[−3.72]	[−3.71]	[−3.46]	[−3.68]	[−3.47]	[−3.56]	[−3.71]	[−3.55]	[−3.65]
OS	−0.025 ***	−0.027 ***	−0.024 ***	−0.024 ***	−0.024 ***	−0.024 ***	−0.024 ***	−0.025 ***	−0.024 ***	−0.025 ***	−0.033 ***
	[−3.10]	[−3.06]	[−3.23]	[−3.24]	[−3.25]	[−3.23]	[−3.24]	[−3.17]	[−3.24]	[−3.32]	[−3.52]
PSO	0.016 *** [5.11]	0.017 *** [7.11]	0.034 *** [15.9]	0.073 *** [16.1]	0.034 *** [14.8]	0.035 *** [15.3]	0.036 *** [15.5]	0.038 *** [16.3]	0.037 *** [16.1]	0.050 [1.56]	0.037 *** [14.7]
SSO	0.050 [0.51]	0.059 [0.91]	0.027 *** [4.58]	0.028 *** [4.74]	0.027 *** [4.90]	0.025 *** [4.40]	0.028 *** [5.03]	0.082 *** [5.37]	0.028 *** [4.74]	−0.013 [−1.60]	0.025 *** [4.20]
UF	0.0043 [1.54]	0.0051 [1.64]	0.023 *** [3.97]	0.022 *** [3.95]	0.020 *** [3.67]	0.022 *** [3.92]	0.020 *** [3.68]	0.020 *** [3.77]	0.022 *** [3.95]	0.019 *** [3.74]	0.020 *** [3.88]
I	0.24 *** [6.72]	0.28 *** [7.72]	0.26 *** [7.28]	0.25 *** [7.21]	0.26 *** [7.48]	0.26 *** [7.35]	0.26 *** [7.41]	0.25 *** [6.93]	0.25 *** [7.21]	0.20 *** [5.49]	0.23 *** [6.41]
PAR	0.50 *** [6.74]	0.51 *** [8.74]	0.50 *** [8.49]	0.50 *** [8.51]	0.51 *** [8.66]	0.50 *** [8.52]	0.50 *** [8.62]	0.51 *** [8.66]	0.50 *** [8.51]	0.47 *** [8.09]	0.43 *** [7.31]
T	0.13 *** [2.58]	0.14 *** [2.88]	0.15 *** [3.10]	0.15 *** [3.09]	0.14 *** [2.99]	0.15 *** [3.06]	0.14 *** [3.01]	0.14 *** [2.86]	0.15 *** [3.09]	0.15 *** [3.21]	0.14 *** [2.95]
RSR	0.024 *** [12.0]	0.020 *** [15.0]	0.022 *** [16.6]	0.022 *** [16.6]	0.023 *** [16.8]	0.023 *** [16.7]	0.023 *** [16.7]	0.022 *** [16.7]	0.022 *** [16.6]	0.022 *** [16.3]	0.021 *** [15.7]

Table 5. *Cont.*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
Corporate governance characteristics											
ACM	−0.014 **	−0.017 **	−0.014 **	−0.014 **	−0.016 **	−0.015 **	−0.016 **	−0.018 **	−0.014 **	−0.017 **	−0.016 **
	[−2.26]	[−2.36]	[−2.01]	[−2.04]	[−2.23]	[−2.10]	[−2.19]	[−2.48]	[−2.04]	[−2.42]	[−2.23]
COED	−0.081	−0.085	−0.056	−0.054	−0.064	−0.060	−0.061	−0.064	−0.054	−0.089	−0.070
	[−1.14]	[−1.44]	[−0.95]	[−0.92]	[−1.09]	[−1.02]	[−1.03]	[−1.08]	[−0.92]	[−1.52]	[−1.19]
FOBD	−0.051 **	−0.055 **	−0.050 **	−0.050 **	−0.052 **	−0.051 **	−0.051 **	−0.049 **	−0.050 **	−0.039 *	−0.053 **
	[−2.30]	[−2.40]	[−2.23]	[−2.21]	[−2.29]	[−2.26]	[−2.26]	[−2.17]	[−2.21]	[−1.71]	[−2.34]
IDOBM	0.052 ***	0.059 ***	0.063 ***	0.063 ***	0.064 ***	0.063 ***	0.044 ***	0.064 ***	0.063 ***	0.058 ***	0.060 ***
	[6.14]	[7.14]	[7.64]	[7.63]	[7.86]	[7.75]	[7.83]	[7.86]	[7.63]	[7.11]	[7.31]
IPO market characteristics											
HM	−0.090 **	−0.080 **	−0.095 **	−0.097 **	−0.10 ***	−0.099 ***	−0.10 ***	−0.12 ***	−0.097 **	0.019	−0.093 **
	[−2.18]	[−2.08]	[−2.53]	[−2.56]	[−2.67]	[−2.60]	[−2.68]	[−3.18]	[−2.56]	[0.50]	[−2.45]
IPOV	−0.020 ***	−0.029 ***	−0.023 **	−0.023 **	−0.024 ***	−0.023 **	−0.022 **	−0.026 ***	−0.023 **	−0.032 ***	−0.020 **
	[−3.14]	[−3.04]	[−2.49]	[−2.51]	[−2.60]	[−2.43]	[−2.43]	[−2.77]	[−2.51]	[−3.52]	[−2.20]
PSMV	0.070 ***	0.078 ***	0.125 ***	0.124 ***	0.0114 ***	0.124 ***	0.115 ***	0.119 ***	0.126 ***	0.035 *	0.19 ***
	[5.15]	[4.15]	[6.65]	[6.73]	[6.32]	[6.51]	[6.13]	[6.34]	[6.73]	[1.86]	[5.79]
Macroeconomic characteristics											
IR	0.010	0.012	−0.052 ***	−0.053 ***	−0.041 ***	−0.046 ***	−0.041 ***	−0.039 ***	−0.053 ***	−0.019 *	−0.048 ***
	[1.00]	[1.05]	[−5.22]	[−5.42]	[−4.06]	[−4.34]	[−3.91]	[−3.88]	[−5.42]	[−1.74]	[−4.82]
FDII	−0.014	−0.015	0.021 *	0.019	0.010	0.020	0.012	0.013	0.019	0.051 ***	0.026 **
	[−1.50]	[−1.10]	[1.65]	[1.49]	[0.77]	[1.64]	[0.95]	[1.05]	[1.49]	[3.48]	[2.09]
TR	0.040	0.052	0.042	0.043	0.044	0.041	0.047	0.049	0.042	0.036	0.069
	[0.95]	[0.85]	[0.87]	[0.85]	[0.85]	[0.85]	[0.85]	[0.93]	[0.85]	[0.81]	[1.06]
GDP	0.14 ***	0.11 ***	0.11 ***	0.12 ***	0.13 ***	0.12 ***	0.12 ***	0.13 ***	0.12 ***	0.018 *	0.10 ***
	[12.4]	[15.6]	[12.1]	[14.3]	[15.2]	[13.6]	[15.0]	[16.5]	[14.3]	[1.88]	[15.2]
CLEO	−0.25 ***	−0.34 ***	−0.19 ***	−0.20 ***	−0.26 ***	−0.21 ***	−0.24 ***	−0.26 ***	−0.20 ***	−0.29 ***	−0.14 ***
	[−6.51]	[−7.71]	[−4.88]	[−5.31]	[−6.67]	[−5.26]	[−6.33]	[−6.64]	[−5.31]	[−6.67]	[−3.62]
Additional controlling variables for robustness testing											
SE	−0.067 ***										
	[−16.4]										
SAR		0.038									
		[0.96]									
ESR			0.088 **								
			[2.27]								
RL				11.5 ***							
				[4.89]							
CC					0.092 ***						
					[4.19]						
TPG						0.09 ***					
						[4.29]					
DCM							0.29 ***				
							[8.57]				
DMS								0.088 **			
								[2.27]			
EBF									0.64 ***		
									[13.6]		
GST										−0.015	
										[−0.51]	
PUB											−0.096 ***
											[−15.0]
FED	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE	YE & CE & IE
Constant	−3.34 ***	−4.30 ***	−4.56 ***	−4.17 ***	−4.04 ***	−4.17 ***	−5.54 ***	−4.56 ***	−7.01 ***	−4.23 ***	−3.99 ***
	[−10.2]	[−15.2]	[−17.8]	[−33.6]	[−33.4]	[−32.9]	[−23.9]	[−17.8]	[−26.6]	[−32.6]	[−17.3]
Observations	27,182	27,182	27,182	27,182	27,182	27,182	27,182	27,182	27,182	27,182	27,182
Adjusted R^2	0.25	0.23	0.23	0.24	0.23	0.24	0.24	0.23	0.25	0.25	0.23
Mean VIF value	1.94	1.97	1.84	1.99	2.11	1.94	1.84	1.96	1.95	1.81	2.10
Wu−Hausman F statistics											4.81 ***
Cragg–Donald Wald partial F statistic											219 ***

6. Conclusions

6.1. Research Summary

This study investigated how hiring Big 4 auditing firms help IPO owners attract VC funding when going public in the global IPO market. VCs carefully evaluate IPO investment risks (Kaiser et al. 2007a), and the participation of a Big 4 audit firm may reduce risks associated with financial inaccuracies, fraud, and failure to meet regulatory standards (Khurana and Raman 2004), offering more confidence to VCs. In recent times, audit scandals connected to IPOs have reduced confidence in financial reporting, making VC investors wary of IPOs (Agrawal and Cooper 2010; Petra and Spieler 2020). Moreover, scepticism related to audit scandals has made VCs more cautious about IPO investments, requesting greater due diligence and tougher monitoring (Beatty et al. 2013). Financial misbehaviour, fraud, and large mistakes in IPOs highlight the need to examine Big 4 audit firms' role in IPOs' ability to attract VCs. In this context, studying how audit firm selection affects IPOs' VC backing can enhance the auditing and venture capital literature by revealing factors affecting VC confidence and risk evaluation (Amini et al. 2022; Beatty 1989; Certo et al. 2001; Chan et al. 2021; Firth and Liau-Tan 1998; Liu et al. 2021). To the best of my knowledge, no current study has empirically examined how hiring Big 4 auditing firms helps IPO businesses attract VCs. Addressing the research gap concerning this unexplored association may inform policy discussions, regulatory changes, and best practices to improve transparency, accountability, and investor protection in the IPO market.

6.2. Summary of Findings

The results of this study validate that hiring Big 4 auditors substantially boosts the chances of IPO owners attracting VC participation by up to 50% in the global IPO market. The findings support prior studies, which indicated that owners of IPOs deliberately choose Big 4 audit firms to lower agency costs, increase openness and disclosure, and boost investor confidence in the IPO market (Cumming and Johan 2008; Iatridis 2012; Jamaani and Alidarous 2022; Obeng et al. 2021). Building on the foundations of the PAT and ST, this research confirms that IPO owners signal their dedication to strong governance practices, establish confidence with VCs, and improve their reputation in the market. This, in turn, boosts their ability to attract investments and accomplish a successful IPO (Chan et al. 2021; Colombo 2021). Moreover, external monitoring and assurance provided by the Big 4 audit firms are crucial for minimising information asymmetries, aligning the objectives of VCs and business management, and cultivating favourable relationships that promote VC involvement in IPOs (Gompers 1995; Huang et al. 2020; Joshi et al. 2022; Liu et al. 2021). The study also found that the PAT and ST in the IPO market explain the relationships and developments among important parties involved in the IPO process (Amini et al. 2022; Beatty 1989; Certo et al. 2001; Chan et al. 2021; Firth and Liau-Tan 1998; Liu et al. 2021). Furthermore, the findings validate that using the PAT and ST may effectively assess the impact of engaging Big 4 audit firms on attracting VCs for IPOs, which is achieved by sending a quality signal that reduces agency costs between IPO owners and VCs, enhancing VC trust and increasing transparency and disclosure in the IPO prospectus.

6.3. Limitations and Future Research Directions

This research has several limitations that can improved for future research directions. First, a research limitation of the study in question is that some researchers claim that VCs are selected several years before the auditors, suggesting that causality may be reversed[5] (Drover et al. 2017). One method to address this problem is to examine the impact of employing the Big 4 auditors on VCs supporting IPOs for both new startups and well-established IPOs. Unfortunately, the data from this research do not include such a dataset. Therefore, future research might enhance the empirical outcomes of this study by examining the impact of employing the Big 4 auditors on venture capitalists supporting startup IPOs compared to well-established IPOs.

Second, the study is limited to studying the role of the Big 4's involvement in IPOs on the ability of IPO owners to attract VC investment. VC investors prioritize early-stage ventures due to the increased costs and uncertainties involved in these investments (Drover et al. 2017). This sets VC financing apart from CF investment, PE investment, and AI investment, as the latter three typically rely on their own funds (Busenitz et al. 2004). Further research could be conducted to examine the connection between hiring one of the Big 4 audit firms and the capacity of IPO owners to attract CF, PE, and AI investors. For example, the significance of this future research stems from the distinctions between VCs and PE investors within the context of IPO owners (Bruton et al. 2010; Chahine et al. 2007; Tykvová 2018). First, there is a distinction between the investment stage and size. Typically, VCs invest smaller amounts in startups and early-stage companies, aiming to support their growth and potential for a profitable exit (Tykvová 2018). In contrast, PE investors usually make substantial investments in well-established companies, often through leveraged buyouts, recapitalisations, or growth capital (Chahine and Saade 2011). Thus, the primary focus is on optimising operational effectiveness, profitability, and growth to generate returns. Additionally, there is a distinction in the investment horizon (Bruton et al. 2010), as investors in the VC industry typically have a longer-term perspective, patiently waiting for their investments to expand and potentially undergo an IPO or acquisition (Tykvová 2018). On the other hand, PE investors typically maintain a long-term investment horizon, although they may have a more expedited timeframe for accomplishing their return targets (Chahine and Saade 2011). These objectives might involve options such as an IPO, sale to another company, or other exit strategies (Chahine and Saade 2011). Additionally, VCs and PEs differ in risk tolerance. VCs are well-versed in taking on higher levels of risk by investing in fledgling companies that have yet to establish a clear path to success (Metrick and Yasuda 2011). In contrast, PE investors typically prioritise more mature companies that have established cash flows and market positions (Metrick and Yasuda 2011). These types of investments generally carry lower risk compared to early-stage investments. Another important aspect to consider is the distinction between involvement and control between VCs and PEs. VCs typically offer mentorship, strategic guidance, and networking opportunities to businesses they invest in without actively pursuing operational control (Payne et al. 2009), whereas PE investors adopt a proactive approach and typically aim for a substantial level of influence over their invested companies (Bedford and Ditillo 2022; Payne et al. 2009), applying operational enhancements, strategic adjustments, and governance frameworks (Bedford and Ditillo 2022).

Third, this research does not account for some of VCs' characteristics, including VC style-drift[6]. Koenig and Burghof (2022) demonstrate that the most frequent VC fund structure is an independent private partnership involving limited partners (LPs) giving cash and general partners (GPs) managing it. The interaction among the many participants engaged as VCs may be described in a simple manner as follows: VCs are financial intermediaries that secure cash from investors, such as pension funds or family offices, who operate as LPs (Koenig and Burghof 2022). GPs, who are often venture capital firms, contribute a small portion of the fund's capital and invest all the money into entrepreneurial enterprises on behalf of their LPs (Cumming et al. 2009). The remuneration of GPs comprises a predetermined management fee that is determined by the value of the assets they oversee as well as a carried interest that functions similarly to an option, entitling them to a portion of the fund's profits (Buzzacchi et al. 2015). The objective of the fund is to enhance the value of the invested money over the duration of the fund. This is accomplished by divesting from its portfolio firms after significantly enhancing their value, and then returning the fund's cash to the investors. Cumming et al. (2009) and Buzzacchi et al. (2015) show that many LPs worry about investing style drifts. Thus, why GP and LP seldom guarantee investing style is odd. The LP's sole indicator of a fund's risk-return profile is an implied investing style agreement. To achieve their preferred risk-return allocation, LPs choose funds depending on their predicted investing style (Cumming et al. 2009). A fund invests in entrepreneurial projects based on their growth stage, location, and industry. LPs and GPs

constitute a conventional principal-agent relationship since LPs have little impact on investment choices beyond their first capital commitment and must trust GPs to operate in their best interest (Buzzacchi et al. 2015). LPs cannot generally withdraw funds to rebalance their risk–return profile when GPs deviate from their planned investing approach (Cumming et al. 2009). Koenig and Burghof (2022) argue that this might cause agency conflict. Thus, future research can account for VC-style drift, which may boost Big 4 auditor demand.

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Conflicts of Interest: The author declares no conflict of interest.

Notes

1 CF investing is a strategy for generating funds by mobilizing a substantial number of people, usually via online platforms (Drover et al. 2017). CF enables entrepreneurs, companies, or projects to get capital from a wide range of individuals, with each person making tiny contributions. CF investing is the process of collecting small sums of money from a large group of individuals, often in return for prizes, ownership shares, or borrowed funds. It is frequently employed for projects, goods, or innovative undertakings in their first stages (Drover et al. 2017).

2 PE investment involves investing in privately held firms or publicly traded corporations that are later taken off the stock market (Tykvová 2018). The purpose is to reorganize or expand these companies before ultimately selling them for a financial gain. Therefore, PE investments are often made in firms that are more developed and have well-established business concepts. They often strive to enhance the company's operations, reduce expenses, and boost profitability before to divesting from the venture (Tykvová 2018).

3 AIs are wealthy investors who invest money in a new firm, often in return for convertible debt or ownership stock (Drover et al. 2017). They frequently provide capital to nascent enterprises and provide their specialized knowledge and extensive connections in addition to financial support. AIs are often people who use their own funds to invest in startups or small enterprises. AIs frequently take part in the first phases of a company's growth and can supply both financial backing as well as mentoring and direction (Drover et al. 2017).

4 This research contends that by enlisting the services of a Big 4 audit firm, IPO owners are signalling to the market their readiness to bear the expenses linked with appointing a respected auditor to offer unbiased validation of their financial statements. This high-level communication can assist in reducing information disparities and instilling trust in investors regarding the accuracy of the financial information disclosed by the company (Colombo 2021; Drover et al. 2018; Firth and Liau-Tan 1998).

5 This study appreciates the anonymous reviewer for highlighting the issue of reverse causality, which enables this research to address this limitation and suggest it for future research endeavors.

6 This study acknowledges the anonymous reviewer for bringing attention to the problem of VC style-drift. This allows the research to address this constraint and propose it as a topic for future research attempts.

References

Abbott, Lawrence J., Russell Barber, William L. Buslepp, and Pradeep Sapkota. 2023. Is Audit Partner Identification Useful? Evidence from the KPMG "Steal the Exam" Scandal. *Auditing: A Journal of Practice & Theory* 42: 1–22.

Abid, Ammar, Muhammad Shaique, and Muhammad Anwar ul Haq. 2018. Do big four auditors always provide higher audit quality? Evidence from Pakistan. *International Journal of Financial Studies* 6: 58. [CrossRef]

Aggarwal, Raj, and John W. Goodell. 2009. Markets and institutions in financial intermediation: National characteristics as determinants. *Journal of Banking & Finance* 33: 1770–80. [CrossRef]

Agrawal, Anup, and Tommy Cooper. 2010. Accounting scandals in IPO firms: Do underwriters and VCs help? *Journal of Economics & Management Strategy* 19: 1117–81.

Alavi, Arash, Peter Kien Pham, and Toan My Pham. 2008. Pre-IPO ownership structure and its impact on the IPO process. *Journal of Banking & Finance* 32: 2361–75.

Alidarous, Manal. 2024. Can the Presence of Big 4 Auditors in IPO Prospectus Reduce Failure Risk? *Journal of Risk and Financial Management* 17: 234. [CrossRef]

Amini, Shima, Abdulkadir Mohamed, Armin Schwienbacher, and Nicholas Wilson. 2022. Impact of venture capital holding on firm life cycle: Evidence from IPO firms. *Journal of Corporate Finance* 74: 102224. [CrossRef]

Arthurs, Jonathan D., and Lowell W. Busenitz. 2003. The boundaries and limitations of agency theory and stewardship theory in the venture capitalist/entrepreneur relationship. *Entrepreneurship Theory and Practice* 28: 145–62. [CrossRef]

Badru, Bazeet Olayemi, Nurwati A. Ahmad-Zaluki, and Wan Nordin Wan-Hussin. 2019. Signalling IPO quality through female directors. *International Journal of Managerial Finance* 15: 719–43. [CrossRef]

Beatty, Anne, Scott Liao, and Jeff Jiewei Yu. 2013. The spillover effect of fraudulent financial reporting on peer firms' investments. *Journal of Accounting and Economics* 55: 183–205. [CrossRef]
Beatty, Randolph P. 1989. Auditor reputation and the pricing of initial public offerings. *Accounting Review* 64: 693–709.
Becker, Connie L., Mark L. DeFond, James Jiambalvo, and K. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15: 1–24. [CrossRef]
Bedford, David S., and Angelo Ditillo. 2022. From governing to managing: Exploring modes of control in private equity relationships. *European Accounting Review* 31: 843–75. [CrossRef]
Bergh, Donald D., Brian L. Connelly, David J. Ketchen, Jr., and Lu M. Shannon. 2014. Signalling theory and equilibrium in strategic management research: An assessment and a research agenda. *Journal of Management Studies* 51: 1334–60. [CrossRef]
Bernstein, Shai, Arthur Korteweg, and Kevin Laws. 2017. Attracting early-stage investors: Evidence from a randomized field experiment. *The Journal of Finance* 72: 509–38. [CrossRef]
Bhasin, Madan Lal. 2013. Corporate accounting fraud: A case study of Satyam Computers Limited. *Open Journal of Accounting* 2: 26–38. [CrossRef]
Boulton, Thomas J., Scott B. Smart, and Chad J. Zutter. 2010. IPO underpricing and international corporate governance. *Journal of International Business Studies* 41: 206–22. [CrossRef]
Boulton, Thomas J., Scott B. Smart, and Chad J. Zutter. 2017. Conservatism and international IPO underpricing. *Journal of International Business Studies* 48: 763–85. [CrossRef]
Brav, Alon, and Paul A. Gompers. 1997. Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies. *The Journal of Finance* 52: 1791–821.
Bruton, Garry D., Igor Filatotchev, Salim Chahine, and Mike Wright. 2010. Governance, ownership structure, and performance of IPO firms: The impact of different types of private equity investors and institutional environments. *Strategic Management Journal* 31: 491–509. [CrossRef]
Burke, Jenna J., Rani Hoitash, and Udi Hoitash. 2019. Audit partner identification and characteristics: Evidence from US Form AP filings. *Auditing: A Journal of Practice & Theory* 38: 71–94.
Busenitz, Lowell W., James O. Fiet, and Douglas D. Moesel. 2004. Reconsidering the venture capitalists' "value added" proposition: An interorganizational learning perspective. *Journal of Business Venturing* 19: 787–807. [CrossRef]
Busenitz, Lowell W., James O. Fiet, and Douglas D. Moesel. 2005. Signaling in venture capitalist—New venture team funding decisions: Does it indicate long–term venture outcomes? *Entrepreneurship Theory and Practice* 29: 1–12. [CrossRef]
Butler, Alexander W., Michael O'Connor Keefe, and Robert Kieschnick. 2014. Robust determinants of IPO underpricing and their implications for IPO research. *Journal of Corporate Finance* 27: 367–83. [CrossRef]
Buzzacchi, Luigi, Giuseppe Scellato, and Elisa Ughetto. 2015. Investment stage drifts and venture capital managerial incentives. *Journal of Corporate Finance* 33: 118–28. [CrossRef]
Cahan, Steven F., David Emanuel, and Jerry Sun. 2009. Are the reputations of the large accounting firms really international? Evidence from the Andersen-Enron affair. *Auditing: A Journal of Practice & Theory* 28: 199–226.
Cameron, A. Colin, and Douglas L. Miller. 2015. A practitioner's guide to cluster-robust inference. *Journal of Human Resources* 50: 317–72. [CrossRef]
Carter, Richard, and Steven Manaster. 1990. Initial public offerings and underwriter reputation. *The Journal of Finance* 45: 1045–67. [CrossRef]
Cazavan-Jeny, Anne, and Thomas Jeanjean. 2007. Levels of voluntary disclosure in IPO prospectuses: An empirical analysis. *Review of Accounting and Finance* 6: 131–49. [CrossRef]
Certo, S. Trevis. 2003. Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of Management Review* 28: 432–46. [CrossRef]
Certo, S. Trevis, Jeffrey G. Covin, Catherine M. Daily, and Dan R. Dalton. 2001. Wealth and the effects of founder management among IPO-stage new ventures. *Strategic Management Journal* 22: 641–58. [CrossRef]
CFO Magazine. 2007. Deloitte to Pay $167.5M in Adelphia Case. Available online: https://www.cfo.com/news/deloitte-to-pay-1675m-in-adelphia-case/674196/ (accessed on 1 March 2024).
Chahine, Salim. 2008. Underpricing versus gross spread: New evidence on the effect of sold shares at the time of IPOs. *Journal of Multinational Financial Management* 18: 180–96. [CrossRef]
Chahine, Salim, and Samer Saade. 2011. Shareholders' rights and the effect of the origin of venture capital firms on the underpricing of US IPOs. *Corporate Governance: An International Review* 19: 601–21. [CrossRef]
Chahine, Salim, Igor Filatotchev, and Mike Wright. 2007. Venture capitalists, business angels, and performance of entrepreneurial IPOs in the UK and France. *Journal of Business Finance & Accounting* 34: 505–28.
Chan, K. Hung, Phyllis Lai Lan Mo, and Weiyin Zhang. 2021. Do abnormal IPO audit fees signal IPO audit quality and post-IPO performance? A principal-agent analysis based on evidence from China. *Journal of International Accounting Research* 20: 1–29. [CrossRef]
Chang, Xin, André F. Gygax, Elaine Oon, and Hong Feng Zhang. 2008. Audit quality, auditor compensation and initial public offering underpricing. *Accounting & Finance* 48: 391–416. [CrossRef]
Chen, Jengfang, Ni-Yun Chen, Liyu He, and Chris Patel. 2022. The effect of ownership structure on disclosure quality and credit ratings in family firms: The moderating role of auditor choice. *Family Business Review* 35: 140–58. [CrossRef]

Chen, Ken Y., Kuen-Lin Lin, and Jian Zhou. 2005. Audit quality and earnings management for Taiwan IPO firms. *Managerial Auditing Journal* 20: 86–104. [CrossRef]
Chen, Xiao-Ping, Xin Yao, and Suresh Kotha. 2009. Entrepreneur passion and preparedness in business plan presentations: A persuasion analysis of venture capitalists' funding decisions. *Academy of Management Journal* 52: 199–214. [CrossRef]
Ciuchta, Michael P., Chaim Letwin, Regan Stevenson, Sean McMahon, and M. Nesij Huvaj. 2018. Betting on the coachable entrepreneur: Signaling and social exchange in entrepreneurial pitches. *Entrepreneurship Theory and Practice* 42: 860–85. [CrossRef]
Cohen, Boyd D., and Thomas J. Dean. 2005. Information asymmetry and investor valuation of IPOs: Top management team legitimacy as a capital market signal. *Strategic Management Journal* 26: 683–90. [CrossRef]
Colombo, Oskar. 2021. The use of signals in new-venture financing: A review and research agenda. *Journal of Management* 47: 237–59. [CrossRef]
Connelly, Brian L., S. Trevis Certo, R. Duane Ireland, and Christopher R. Reutzel. 2011. Signaling theory: A review and assessment. *Journal of Management* 37: 39–67. [CrossRef]
Copley, Paul, Edward Douthett, and Suning Zhang. 2021. Venture capitalists and assurance services on initial public offerings. *Journal of Business Research* 131: 278–86. [CrossRef]
Cragg, John G., and Stephen G. Donald. 1993. Testing identifiability and specification in instrumental variable models. *Econometric Theory* 9: 222–40. [CrossRef]
Cumming, Douglas, and Sofia Johan. 2008. Information asymmetries, agency costs and venture capital exit outcomes. *Venture Capital* 10: 197–231. [CrossRef]
Cumming, Douglas, Grant Fleming, and Armin Schwienbacher. 2009. Style drift in private equity. *Journal of Business Finance & Accounting* 36: 645–78.
De Carvalho, Antonio Gledson, Roberto B. Pinheiro, and Joelson Oliveira Sampaio. 2020. The dynamics of earnings management in IPOs and the role of venture capital. *Research in International Business and Finance* 51: 101084. [CrossRef]
De Franco, Gus, Ilanit Gavious, Justin Y. Jin, and Gordon D. Richardson. 2011. Do private company targets that hire Big 4 auditors receive higher proceeds? *Contemporary Accounting Research* 28: 215–62. [CrossRef]
DeAngelo, Linda Elizabeth. 1981. Auditor size and audit quality. *Journal of Accounting and Economics* 3: 183–99. [CrossRef]
DeFond, Mark L. 1992. The association between changes in client firm agency costs and auditor switching. *Auditing: A Journal of Practice & Theory* 11: 16.
Defond, Mark L., Jere R. Francis, and Nicholas J. Hallman. 2018. Awareness of SEC enforcement and auditor reporting decisions. *Contemporary Accounting Research* 35: 277–313. [CrossRef]
Drover, Will, Lowell Busenitz, Sharon Matusik, David Townsend, Aaron Anglin, and Gary Dushnitsky. 2017. A review and road map of entrepreneurial equity financing research: Venture capital, corporate venture capital, angel investment, crowdfunding, and accelerators. *Journal of Management* 43: 1820–53. [CrossRef]
Drover, Will, Matthew S. Wood, and Andrew C. Corbett. 2018. Toward a cognitive view of signalling theory: Individual attention and signal set interpretation. *Journal of Management Studies* 55: 209–31. [CrossRef]
DuCharme, Larry L., Paul H. Malatesta, and Stephan E. Sefcik. 2001. Earnings management: IPO valuation and subsequent performance. *Journal of Accounting, Auditing & Finance* 16: 369–96.
Fan, Joseph P. H., and Tak Jun Wong. 2005. Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia. *Journal of Accounting Research* 43: 35–72. [CrossRef]
Firth, Michael, and Chee Keng Liau-Tan. 1998. Auditor quality, signalling, and the valuation of initial public offerings. *Journal of Business Finance & Accounting* 25: 145–65. [CrossRef]
Francis, Jere R., and Dechun Wang. 2008. The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25: 157–91. [CrossRef]
Gao, Yanmin, Karim Jamal, Qiliang Liu, and Le Luo. 2011. Does Reputation Discipline Big 4 Audit Firms? Paper presented at the CAAA Annual Conference, Toronto, ON, Canada, January 28, paper no. 2013-1006.
Gilson, Stuart, and Belén Villalonga. 2007. Adelphia Communications Corp.'s Bankruptcy. Harvard Business School Case, 208-071. Available online: https://www.hbs.edu/faculty/Pages/item.aspx?num=35079 (accessed on 4 July 2024).
Global Competitiveness Report. 2019. World Economic Forum. Available online: https://www.weforum.org/reports/how-to-end-a-decade-of-lost-productivity-growth (accessed on 30 December 2021).
Gompers, Paul. 1995. Optimal Investment, Monitoring, and the Staging of Venture Capital. *Journal of Finance* 50: 1461–89. [CrossRef]
Gompers, Paul A. 2022. Optimal investment, monitoring, and the staging of venture capital. In *Venture Capital*. New York: Routledge, pp. 285–313.
Gompers, Paul A., Will Gornall, Steven N. Kaplan, and Ilya A. Strebulaev. 2020. How do venture capitalists make decisions? *Journal of Financial Economics* 135: 169–90. [CrossRef]
Gray, Sidney J. 1988. Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus* 24: 1–15. [CrossRef]
Gray, Sidney J., and Hazel M. Vint. 1995. The impact of culture on accounting disclosures: Some international evidence. *Asia-Pacific Journal of Accounting* 2: 33–43. [CrossRef]
Habib, Michel A., and Alexander P. Ljungqvist. 2001. Underpricing and entrepreneurial wealth losses in IPOs: Theory and evidence. *The Review of Financial Studies* 14: 433–58. [CrossRef]

Hallen, Benjamin L., Riitta Katila, and Jeff D. Rosenberger. 2014. How do social defenses work? A resource-dependence lens on technology ventures, venture capital investors, and corporate relationships. *Academy of Management Journal* 57: 1078–101. [CrossRef]
Haswell, Stephen, and Elaine Evans. 2018. Enron, fair value accounting, and financial crises: A concise history. *Accounting, Auditing & Accountability Journal* 31: 25–50.
Hausman, Jerry A. 1978. Specification tests in econometrics. *Econometrica: Journal of the Econometric Society* 46: 1251–71.
Hofstede, Geert. 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations*. Newbury Park: Sage Publications.
Hope, Ole-Kristian. 2003. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research* 41: 235–72. [CrossRef]
Hope, Ole-Kristian, John Christian Langli, and Wayne B. Thomas. 2012. Agency conflicts and auditing in private firms. *Accounting, Organizations and Society* 37: 500–17. [CrossRef]
Huang, Laura, and Andrew P. Knight. 2017. Resources and relationships in entrepreneurship: An exchange theory of the development and effects of the entrepreneur-investor relationship. *Academy of Management Review* 42: 80–102. [CrossRef]
Huang, Pinghsun, Yi-Chieh Wen, and Yan Zhang. 2020. Does the monitoring effect of Big 4 audit firms really prevail? Evidence from managerial expropriation of cash assets. *Review of Quantitative Finance and Accounting* 55: 739–68. [CrossRef]
Husnin, Azrul Ihsan, Anuar Nawawi, and Ahmad Saiful Azlin Puteh Salin. 2016. Corporate governance and auditor quality–Malaysian evidence. *Asian Review of Accounting*. [CrossRef]
Iatridis, George Emmanuel. 2012. Audit quality in common-law and code-law emerging markets: Evidence on earnings conservatism, agency costs and cost of equity. *Emerging Markets Review* 13: 101–17. [CrossRef]
Insider. 2021. Amazon-Backed Deliveroo Heads to Its $2.5 Billion IPO Facing Rider Strikes and Investor Snubs over Its Business Model. Available online: https://www.businessinsider.com/deliveroos-ipo-beset-by-criticism-over-worker-pay-profitability-2021-3 (accessed on 1 March 2024).
International Monetary Fund. 2022. The IMF and the Group of Twenty. Available online: https://www.imf.org/en/Research/IMFandG20 (accessed on 19 March 2024).
Islam, Majidul, and Ashrafee Tanvir Hossain. 2017. Compliance with accounting standards by financial Institutions: Some evidence from Bangladesh. *Research in Accounting Regulation* 29: 145–51. [CrossRef]
Jacob, Joshy, Naman Desai, and Sobhesh Kumar Agarwalla. 2019. An examination of factors driving big 4 audit fee premiums: Evidence from India's audit market. *Accounting Horizons* 33: 43–58. [CrossRef]
Jamaani, Fouad, and Abdullahi D. Ahmed. 2020. Simultaneous effects of clustering and endogeneity on the underpricing difference of IPO firms: A global evidence. *Research in International Business and Finance* 54: 101250. [CrossRef]
Jamaani, Fouad, and Abdullahi D. Ahmed. 2021. Modifier effects of country-level transparency on global underpricing difference: New hierarchical evidence. *International Review of Financial Analysis* 74: 101667. [CrossRef]
Jamaani, Fouad, and Abdullahi D. Ahmed. 2022. The psychological and economic roles of culture on global underpricing difference: A new hierarchical evidence. *Journal of Behavioral and Experimental Finance* 33: 100615. [CrossRef]
Jamaani, Fouad, and Abdullah M. Alawadhi. 2023. Inflation and stock market growth: The case of IPO withdrawal. *International Journal of Emerging Markets*. [CrossRef]
Jamaani, Fouad, and Manal Alidarous. 2019. Review of theoretical explanations of IPO underpricing. *Journal of Accounting, Business and Finance Research* 6: 1–18. [CrossRef]
Jamaani, Fouad, and Manal Alidarous. 2021. The short-and long-lived effects of IFRS mandate on IPO firms in emerging market economies. *Journal of Financial Reporting and Accounting* 20: 953–78. [CrossRef]
Jamaani, Fouad, and Manal Alidarous. 2022. Does the appointment of the three musketeers reduce IPO underpricing? Global evidence. *Eurasian Business Review* 13: 887–929. [CrossRef]
Jamaani, Fouad, and Manal Alidarous. 2024. The impact of prestigious attorneys on IPO withdrawal in the global primary market. *Financial Innovation* 10: 13. [CrossRef]
Jamaani, Fouad, Manal Alidarous, and Abdullah Al-Awadhi. 2021. The Early Impact of Government Financial Intervention Policies and Cultural Secrecy on Stock Market Returns During the COVID-19 Pandemic: Evidence from Developing Countries. *International Journal of Financial Research* 12: 401–16. [CrossRef]
Jamaani, Fouad, Manal Alidarous, and Esraa Alharasis. 2022. The combined impact of IFRS mandatory adoption and institutional quality on the IPO companies' underpricing. *Journal of Financial Reporting and Accounting, ahead-of-print*. [CrossRef]
Johl, Shireenjit K., Mohammad Badrul Muttakin, Dessalegn Getie Mihret, Samuel Cheung, and Nathan Gioffre. 2021. Audit firm transparency disclosures and audit quality. *International Journal of Auditing* 25: 508–33. [CrossRef]
Johnson, Bret A., Ling Lei Lisic, Joon Seok Moon, and Mengmeng Wang. 2023. SEC comment letters on form S-4 and M&A accounting quality. *Review of Accounting Studies* 28: 862–909.
Jones, Travis L., and Mushfiq Swaleheen. 2010. Endogenous examination of underwriter reputation and IPO returns. *Managerial Finance* 36: 284–93. [CrossRef]
Joshi, Kshitija, Deepak Chandrashekar, and Bala Subrahmanya. 2022. Monitoring and value-add by venture capital firms in investee firms: The case of foreign VCs operating in India. *International Journal of Entrepreneurial Venturing* 14: 202–29.

Kaiser, Dieter G., Rainer Lauterbach, and Denis Schweizer. 2007a. Total loss risk in European versus US-based venture capital investments. In *Venture Capital in Europe*. Amsterdam: Elsevier, pp. 371–87.
Kaiser, Dieter G., Rainer Lauterbach, and Jan Klaas Verweyen. 2007b. Venture capital financing from an entrepreneur's perspective. *The International Journal of Entrepreneurship and Innovation* 8: 199–207. [CrossRef]
Kaiser, Manuel, and Andreas Kuckertz. 2023. Emotional robustness in times of crisis: The effects of venture funding on the digital communication styles of entrepreneurs. *Journal of Small Business and Enterprise Development* 30: 828–50. [CrossRef]
Kaplan, Steven N., and Per Strömberg. 2001. Venture capitalists as principals: Contracting, screening, and monitoring. *American Economic Review* 91: 426–30. [CrossRef]
Khurana, Inder K., and K. Raman. 2004. Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review* 79: 473–95. [CrossRef]
Khurana, Inder K., and Lei Zhao. 2019. Does the JOBS Act reduce compliance costs of emerging growth companies? Theory and evidence. *Auditing: A Journal of Practice & Theory* 38: 151–75.
Knill, April. 2009. Should venture capitalists put all their eggs in one basket? Diversification versus pure-play strategies in Venture Capital. *Financial Management* 38: 441–86. [CrossRef]
Ko, Eun-Jeong, and Alexander McKelvie. 2018. Signaling for more money: The roles of founders' human capital and investor prominence in resource acquisition across different stages of firm development. *Journal of Business Venturing* 33: 438–54. [CrossRef]
Koenig, Lukas, and Hans-Peter Burghof. 2022. The Investment Style Drift Puzzle and Risk-Taking in Venture Capital. *Review of Corporate Finance* 2: 527–85. [CrossRef]
Lawrence, Alastair, Miguel Minutti-Meza, and Ping Zhang. 2011. Can Big 4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics? *The Accounting Review* 86: 259–86. [CrossRef]
Lee, Gemma, and Ronald W. Masulis. 2011. Do more reputable financial institutions reduce earnings management by IPO issuers? *Journal of Corporate Finance* 17: 982–1000. [CrossRef]
Lee, Philip J., Sarah J. Taylor, and Stephen L. Taylor. 2006. Auditor conservatism and audit quality: Evidence from IPO earnings forecasts. *International Journal of Auditing* 10: 183–99. [CrossRef]
Lin, Hui Ling, Kuntara Pukthuanthong, and Thomas John Walker. 2013. An international look at the lawsuit avoidance hypothesis of IPO underpricing. *Journal of Corporate Finance* 19: 56–77. [CrossRef]
Liu, Qigui, Jinghua Tang, and Gary Tian. 2021. Monitoring or colluding: The role of venture capital investors in the IPO process. *Accounting & Finance* 61: 1017–46.
Masulis, Ronald W., and Rajarishi Nahata. 2009. Financial contracting with strategic investors: Evidence from corporate venture capital backed IPOs. *Journal of Financial Intermediation* 18: 599–631. [CrossRef]
Medina, Leandro, and Friedrich Schneider. 2018. *Shadow Economies Around the World: What Did We Learn over the Last 20 Years?* Washington, DC: International Monetary Fund.
Metrick, Andrew, and Ayako Yasuda. 2011. Venture capital and other private equity: A survey. *European Financial Management* 17: 619–54. [CrossRef]
Ministry of External Affairs, Government of India. 2024. About G20. Available online: https://www.g20.in/en/about-g20/about-g20.html (accessed on 19 March 2024).
Morgan Stanley Capital International. 2020. MSCI Announces the Results of the 2020 Annual Market Classification Review. Available online: https://www.msci.com/market-classification (accessed on 3 December 2021).
Nguyen, Giang, and Vinh Vo. 2021. Asset liquidity and venture capital investment. *Journal of Corporate Finance* 69: 101963. [CrossRef]
Obeng, Victoria A., Kamran Ahmed, and Steven F. Cahan. 2021. Integrated reporting and agency costs: International evidence from voluntary adopters. *European Accounting Review* 30: 645–74. [CrossRef]
Palmrose, Zoe-Vonna. 1988. An analysis of auditor litigation and audit service quality. *Accounting Review* 63: 55–73.
Payne, G. Tyge, Justin L. Davis, Curt B. Moore, and R. Greg Bell. 2009. The deal structuring stage of the venture capitalist decision-making process: Exploring confidence and control. *Journal of Small Business Management* 47: 154–79. [CrossRef]
Petra, Steven, and Andrew C. Spieler. 2020. Accounting scandals: Enron, Worldcom, and global crossing. In *Corporate Fraud Exposed*. Emerald Publishing Limited, pp. 343–60. Available online: https://www.emerald.com/insight/content/doi/10.1108/978-1-78973-417-120201022/full/html (accessed on 4 July 2024).
Plummer, Lawrence A., Thomas H. Allison, and Brian L. Connelly. 2016. Better together? Signaling interactions in new venture pursuit of initial external capital. *Academy of Management Journal* 59: 1585–604. [CrossRef]
Pollock, Timothy G., Guoli Chen, Eric M. Jackson, and Donald C. Hambrick. 2010. How much prestige is enough? Assessing the value of multiple types of high-status affiliates for young firms. *Journal of Business Venturing* 25: 6–23. [CrossRef]
Premti, Arjan, and Garrett Smith. 2020. Earnings management in the pre-IPO process: Biases and predictors. *Research in International Business and Finance* 52: 101120. [CrossRef]
Reiff, Annika, and Tereza Tykvová. 2021. IPO withdrawals: Are corporate governance and VC characteristics the guiding light in the rough sea of volatile markets? *Journal of Corporate Finance* 67: 101908. [CrossRef]
Reuters. 2015. Toshiba Inflated Profits by $1.2 Billion with Top Execs' Knowledge: Investigation. Available online: https://www.reuters.com/article/us-toshiba-accounting-idUSKCN0PU0E920150720 (accessed on 3 March 2024).
Ritter, Jay R. 2013. Re-energizing the IPO market. *Journal of Applied Finance* 24: 37–48. [CrossRef]

Ritter, Jay R., and Ivo Welch. 2002. A review of IPO activity, pricing, and allocations. *The Journal of Finance* 57: 1795–828. [CrossRef]
Ross, Stephen A. 1973. The economic theory of agency: The principal's problem. *The American Economic Review* 63: 134–39.
Sanderson, Eleanor, and Frank Windmeijer. 2016. A weak instrument F-test in linear IV models with multiple endogenous variables. *Journal of Econometrics* 190: 212–21. [CrossRef] [PubMed]
Schnitzer, Monika, and Martin Watzinger. 2022. Measuring the spillovers of venture capital. *Review of Economics and Statistics* 104: 276–92. [CrossRef]
Sharma, A. K. 2015. Venture capitalists' investment decision criteria for new ventures: A review. *Procedia-Social and Behavioral Sciences* 189: 465–70.
Spence, Michael. 2002. Signaling in retrospect and the informational structure of markets. *American Economic Review* 92: 434–59. [CrossRef]
Sundarasen, Sheela Devi, Afzal Khan, and Nakiran Rajangam. 2018. Signalling roles of prestigious auditors and underwriters in an emerging IPO market. *Global Business Review* 19: 69–84. [CrossRef]
Sundarasen, Sheela, Kamilah Kamaludin, Izani Ibrahim, Usha Rajagopalan, and Nevi Danila. 2021. Auditors, underwriters, and firm owners' interaction in an IPO environment: The case of OECD Nations. *Sustainability* 13: 6281. [CrossRef]
Svetek, Mojca. 2022. Signaling in the context of early-stage equity financing: Review and directions. *Venture capital* 24: 71–104. [CrossRef]
Sweeting, Robert C., and Christine F. Wong. 1997. A UKHands-off'Venture Capital Firm and the Handling of Post-investment Investor--Investee Relationships. *Journal of Management Studies* 34: 125–52. [CrossRef]
Taj, Saud A. 2016. Application of signaling theory in management research: Addressing major gaps in theory. *European Management Journal* 34: 338–48. [CrossRef]
Tam, Kinsun, Qiao Xu, Guy Fernando, and Richard A. Schneible. 2023. "Tone at the top": Management's discussion and analysis and audit quality. *Managerial Auditing Journal* 38: 602–33. [CrossRef]
The World Bank. 2016. The World Bank Group's Support to Capital Market Development. Available online: https://documents1.worldbank.org/curated/en/349861476995767563/pdf/The-World-Bank-Group-s-support-to-capital-market-development.pdf (accessed on 6 March 2024).
Toms, Steven, and Chieh Lin. 2023. Economic freedom, financial development and the determinants of fraud and scandal: The United Kingdom, 1900–2010. *Business History* 1–28. [CrossRef]
Tykvová, Tereza. 2018. Venture capital and private equity financing: An overview of recent literature and an agenda for future research. *Journal of Business Economics* 88: 325–62. [CrossRef]
Vinten, Gerald. 2005. Audit expectation-performance gap in the United Kingdom in 1999 and comparison with the gap in New Zealand in 1989 and in 1999. *Managerial Auditing Journal* 20: 561–62. [CrossRef]
Wang, Xin, and Di Song. 2021. Does local corruption affect IPO underpricing? Evidence from China. *International Review of Economics & Finance* 73: 127–38.
Welch, Ivo. 1989. Seasoned offerings, imitation costs, and the underpricing of initial public offerings. *The Journal of Finance* 44: 421–49. [CrossRef]
Yasar, Burze, Thomas Martin, and Timothy Kiessling. 2020. An empirical test of signalling theory. *Management Research Review* 43: 1309–35. [CrossRef]
Zane, Lee J. 2023. Intellectual capital and the acquisition of human capital by technology-based new ventures. *Journal of Intellectual Capital* 24: 780–98. [CrossRef]
Zhang, Yan, and Margarethe F. Wiersema. 2009. Stock market reaction to CEO certification: The signaling role of CEO background. *Strategic Management Journal* 30: 693–710. [CrossRef]
Zhang, Zikai, and Suman Neupane. 2024. Global IPO underpricing during the COVID-19 pandemic: The impact of firm fundamentals, financial intermediaries, and global factors. *International Review of Financial Analysis* 91: 102954. [CrossRef]