Going Concern Opinions and their Effect on Information Asymmetry in Initial Public Offerings

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Abstract: This research examines whether going concern opinions (GCOs) have an effect on the level of information asymmetry in initial public offerings (IPOs). GCOs provide information content about a firm's underlying value. By including a GCO in IPO filings, the already high information asymmetry in IPOs could be reduced, which should result in a more accurate pricing of IPOs. On the other hand, GCOs could potentially increase information asymmetry as investors consider going-concern IPOs to be riskier. This research uses a 10-year sample period (2011-2021) of IPOs and finds that GCOs do not affect the level of information asymmetry in IPOs. However, when using the Big 5 sub-sample, this thesis finds that GCOs provided by a Big 5 audit firm reduce the level of information asymmetry in IPOs, suggesting that GCOs contribute to investors having more access to valuable information when the IPO is audited by a Big 5 auditor.

Key words: going concern opinions, information asymmetry, initial public offerings, big 5 auditor

1. Introduction

This study examines whether going concern opinions (GCOs) have an effect on the level of information asymmetry in initial public offerings (IPOs). Firm's go public because of their desire to not only raise additional capital, but also to profit from an investment opportunity with a positive net present value (Rock, 1986). A firm creates an IPO prospectus during the preparations of an IPO. The IPO prospectus incorporates the audited financial statements, which could include a GCO (Matanova, Steigner, Yi, & Zheng, 2019). An auditor must declare a GCO when he/she is doubtful about the entity's capacity to continue as a going concern, usually for the coming year (Berglund, Eshleman, & Guo, 2018). Mutchler (1985) argues that the external auditor is familiar with the client's current activities and future projects, which is the reason that the auditor's opinion has important information content. Next to that, Jones (1996) suggests that GCOs by auditors on financially distressed firms provide information. Thus, it can be deduced that GCOs reduce information asymmetry. This claim is backed up by Hogan (1997). According to Hogan (1997), an auditor's attestation results in a reduction of information asymmetry between investors and the owners of the firm that decides to go public. Some companies still go public with a GCO on their private-company financial statements. Contrary to common belief, these firms often have successful IPOs (Willenborg & McKeown, 2001). According to Matanova et al. (2019), the level of information asymmetry is higher in IPOs, as information about a private company's operations is restricted. Furthermore, Frankel and Li (2004) argue that information asymmetry between firms' managers and outside investors is a fundamental problem for all market participants. Hence, the question is whether GCOs in IPOs provide information to investors, which could potentially reduce the information asymmetry between investors and the managers of the firms that go public.

Prior research has shown conflicting views regarding the effect of GCOs on the level of underpricing in IPOs, which is a proxy for information asymmetry. Some find that underpricing is lower in going-concern IPOs, as GCOs convey private information to market participants or because GCOs make sure that more material information reaches the market, which supports investors in estimating the true value of the IPO (Willenborg & McKeown, 2001; Matanova et al., 2019). According to Ritter (1984), however, the underpricing of IPOs is larger in case of high-risk IPOs. Prior research has found that a GCO is followed by investors seeking a larger risk premium because it may reduce the quality of information about the company (Lambert, Leuz, & Verrecchia, 2007). In addition, investors view firms with GCOs as risky, and therefore require a greater cost of equity (Amin, Krishnan, & Yang, 2014). Following this line of reasoning, going-concern IPOs are riskier than "normal" IPOs, which results in higher

information asymmetry. Therefore, this thesis hypothesizes that GCOs do not affect the level of information asymmetry in IPOs.

This thesis uses a 10-year sample period of IPOs, more specifically 2011-2021, to empirically test the hypothesis. As information asymmetry cannot be observed, first day initial returns will serve as a proxy (Ma, 2007). Data on IPOs and first day returns are obtained from multiple databases including Audit Analytics and the Center for Research in Security Prices (CRSP) through the Wharton Research Databases Services (WRDS). GCOs are also obtained from Audit Analytics. Data for the control variables is retrieved from Audit Analysitcs and Compustat. As mentioned above, some tension exists in prior research regarding the effect of GCOs on underpricing in IPOs. Some argue that GCOs reduce underpricing in IPOs (Willenborg & McKeown, 2001; Matanova et al., 2019). Others argue that firms that received a GCO are riskier and therefore experience higher underpricing (Ritter, 1984; Lambert, Leuz, & Verrecchia, 2007; Amin, Krishnan, & Yang, 2014). Hence, this thesis uses a multivariate analysis to research which effect is more dominant. In other words, this study examines whether GCOs increase or reduce information asymmetry in IPOs.

This thesis contributes to current research by investigating whether GCOs affect the level of information asymmetry in IPOs contrary to Jones (1996), who conducted his research in a setting where public firms were already financially distressed. Studying GCOs in an IPO-setting is interesting because IPOs are often surrounded by optimism and growth, while GCOs are researched in a context where already-public companies face serious financial distress (Willenborg & McKeown, 2001). Willenborg & McKeown (2001) investigate the role of GCOs in IPOs to see whether a GCO is merely proof that backs up the already existing assumption that a firm will probably go bankrupt. This thesis provides a different perspective on GCOs in IPOs. After all, this thesis investigates whether GCOs influence the information asymmetry in IPOs, rather than focusing on the predictive content of GCOs in an IPO-setting. In addition, Willenborg & McKeown (2001) and Matanova et al. (2019) study the effect of GCOs on underpricing in IPOs, while this study researches the effect of GCOs on information asymmetry in IPOs. Furthermore, Willenborg and McKeown (2001) research the effect of GCOs on micro-cap IPOs. This thesis studies regular and large IPOs. Lastly, this thesis contributes to existing research by providing evidence that GCOs by a Big 5 audit firm provide valuable information to investors and reduce the level of information asymmetry in IPOs.

From a practical point of view, this thesis contributes in a way that it shows whether auditors' GCOs help in the distribution of information across market participants in IPOs. Thus, whether investors are able to better predict the value of the IPO. After all, the majority of IPOs

do not have a long track record of tangible information, for example revenue or past positive earnings. The lack of this information makes it harder for investors to forecast cash flows and value the IPO (Loughran & McDonald, 2013).

A limitation of this research is that the first day initial returns of IPOs capture not only information asymmetry but underpricing as well. Willenborg & McKeown (2001) and Matanova et al. (2019), for example, used the first day initial returns as proxy for underpricing, while Ma (2007) used the same measure as proxy for information asymmetry. Thus, there is a possibility that the true effect of GCOs on information asymmetry is not found. A suggestion for future research would be to think of another proxy that would capture only information asymmetry. Another limitation of this study is the ratio GCO IPOs versus non-GCO IPOs. This ratio differs from prior research, as it is lower. Lastly, the model in this study could be subject to omitted variable bias since there might be variables that are correlated with the first day initial returns, yet not added to the model.

This paper is structured as followed: the literature review and hypothesis development are discussed in section 2. Section 3 includes the sample selection and research design. Lastly, the empirical results are in section 4 and the conclusion is in section 5.

2. Literature Review and Hypothesis Development

2.1. *Information Asymmetry*

In markets where the level of information asymmetry is high, low-value companies fare better than high-value companies. This phenomenon is known as the "lemons problem" (Akerlof, 1970). Prior research has found that auditors are associated with a reduction in information asymmetry between firms and external investors in securities markets. These results are consistent with the notion that audit quality has a prominent role in the allocation of information among market participants (Clinch, Stokes, & Zhu, 2012).

It is important to distinguish the terms valuation uncertainty and information asymmetry as they are similar, however they cannot be used interchangeably. Valuation uncertainty occurs when the stock's value of companies, as determined by investors, is unclear or when investors are uncertain about the firm's true value, whereas information asymmetry occurs when investors are not aware of the firm's genuine quality. However, when information asymmetry is high, valuation uncertainty is greater (Ma, 2007). The term information asymmetry relates to the difference in access to a firm's information between a principal and agent. This information differential is often most beneficial to the agent (Cormier, Ledoux, Magnan, & Aerts, 2010). In this setting, it is assumed that the manager is the agent, and the investor is the principal

(Dierkens, 1991; Frankel & Li, 2004). Information asymmetry between informed and uninformed investors also exists (Chae, 2005; Byun, Hwang, & Lee, 2011; Clinch, Stokes, & Zhu, 2012). However, this type of information asymmetry is not addressed in this research.

Managers and outside investors are both supposed to have the same access to non-firm-specific or market-wide information. As a result, market-wide uncertainty affects not only investors, but managers as well. On the other hand, managers generally have the advantage over outside investors in anticipating firm-specific events. The reason for this is that managers have better access to information about the firm since they receive private information to which outside investors do not have access to. This creates an information gap. The more firm-specific information is known by managers, the higher the information asymmetry of the company. The private information that managers have access to, will ultimately be known by outside investors as well. This happens either through information-releasing events or through the passing of time. Until then, some firm-specific uncertainty is born by investors. Hence, it can be concluded that managers' ability to better predict firm-specific events creates the information asymmetry between managers and investors (Dierkens, 1991). Firms that want to go pubic tend to advertise themselves to outside investors to be of higher quality than they truly are. To compensate investors for sharing favorable information, the IPO offer price has to be set low. The appropriate level of compensation is determined by the investors' prospect to benefit from the information concealment (Benveniste & Spindt, 1989).

2.2. *Going Concern Opinions and their Risk Level*

As already mentioned in section 2.1, auditors are associated with a reduction in information asymmetry between firms and external investors in securities markets. Next to that, audit quality has a prominent role in the allocation of information among market participants (Clinch, Stokes, & Zhu, 2012). An example of such information are GCOs, which are pieces of information that could potentially inform outside investors about a firm's true underlying performance (Jones, 1996). Auditor's base their assessment of a firm on information about events and circumstances present at or preceding the realization of work that pertains to the validity of the GCO when preparing the financial statements, as well as on information gained from performing audit procedures. Auditors must collect information about management's procedures, policies, and strategies in order to alleviate any concerns and determine the likelihood of such procedures being implemented successfully (Carson, et al., 2013).

Although professional auditing standards emphasize that the external auditors' role does not include projecting the audit client's future viability, the standards do obligate the external auditor to review each audit client's continuous viability during each engagement (Blay, Geiger,

& North, 2011). Thus, when the independent auditor is doubtful about the entity's capacity to carry on as a going concern for a certain period, the auditor must declare a GCO, according to professional auditing standards. This period usually amounts to one year after the balance sheet date (Berglund, Eshleman, & Guo, 2018). This extra statement on the auditor's assessment of the client's future viability gives further information to market participants about the auditor's professional evaluation of the risk that the firm will go out of business in the near future. As a result, the external auditor can only truly express his or her concern about the client's future viability through a GCO. Even though disclosures and financial statements enclose other information that offers proof of financial distress and the likelihood of future viability, a GCO adds to the credibility of the firm's future viability, and thus the fulfillment of future income and extended use of current assets and liabilities, in the auditor's professional opinion. Financial distress that is not followed by a GCO is also possible. However, in that case, the external auditor still thinks that the risk of bankruptcy and the probability of liquidation is low. Financial distress without a GCO may indicate to market participants that although the company is experiencing financial difficulties, the firm will create future value from income, but probably at lower levels (Blay, Geiger, & North, 2011).

Blay, Geiger and North (2011) find that market participants consider firms with a GCO on their financial statements to have a greater risk of bankruptcy. They also provide further evidence in support of GCOs that transmit firm-specific information about a higher probability that a firm will go out of business, beyond what is conveyed through alternative sources of information. Overall, Blay, Geiger and North (2011) conclude that market participants take into account the auditor's assessment of a firm's business risk, as disclosed in a GCO, to be incrementally value relevant even when the financial statements consist of other measures that show financial distress. Lambert, Leuz and Verrecchia (2007) argue that a GCO indicates that the going concern (GC) assumption is violated. The GC assumption serves as the foundation for financial reporting and states that financial statement users and preparers assume that an entity will carry on its operations for a certain period of time. A violation of the GC assumption may reduce the quality of information about the company, prompting investors to seek a larger risk premium. As a result, the cost of capital will increase. According to Amin, Krishnan and Yang (2014), a GCO may be seen as a bad sign to equity and debt investors, who are likely to be hesitant to invest in or lend to the firm. They also find that investors regard firms with GCOs as troublesome. In turn, investors require a greater cost of equity for the risk they take by investing. Furthermore, McGuire, Schneeweis and Branch (1990) found that high risk firms are perceived to be of low quality, when looking at for example the investment value. Hence, it can

be deduced that firms that received a GCO are considered to be of higher risk and lower quality than firms that did not receive a GCO.

2.3. *Initial Public Offerings*

Whether a firm goes public or not is, on the other hand, determined by market forces (Willenborg & McKeown, 2001). Company's go public because of their desire to raise additional funds as well as to profit from an investment opportunity with a positive net present value. Although venture funding or bank financing is possible, some firms rather obtain capital through the equity market as larger sums can be raised, without being subject to complicated restrictions and covenants (Rock, 1986).

An initial public offering (IPO) is the first step in an entity's transformation into a public company (Jain & Kini, 1999). When a firm is planning to go public in an IPO, the firm has to present an initial price range. Within this price range, the firm hopes to sell its stock. Hereafter, the underwriters and firm's executives come together with a select group of investors, where underwriters acquire information about the investor's view on the IPO in order to propose an issue size and offer price to the issuer. Subsequent to SEC consent, the offer price is fixed, and shares are allotted, after which trading commences. Generally, the offer price is lower than the closing price after the first day of trading (Willenborg, Wu, & Yang, 2015). First day initial returns are calculated by subtracting the IPO offer price from the closing price on the first day of public trading, divided by the IPO offer price (Willenborg & McKeown, 2001). Hence, it can be deduced that the first day initial returns of IPOs are affected by the IPO offer price as well as by the first day closing price.

During the preparations of an IPO, a firm creates an IPO prospectus, which incorporates the audited financial statements. Auditors may include GCOs in an IPO prospectus as well (Matanova, Steigner, Yi, & Zheng, 2019). IPOs without a GCO experience higher offer prices than going-concern IPOs. Furthermore, going-concern IPOs can reduce ex ante uncertainty by allowing investors to more precisely estimate equity market values (Matanova, Steigner, Yi, & Zheng, 2019). Thus, GCOs affect the IPO offer price in a way that the issuing firm changes the offer price, while the first day closing price is affected by investor's expectations of the true value. Some companies still go public with a GCO on their private-company financial statements. Contrary to common belief, these firms often have successful IPOs. These going-concern IPOs represent contradicting events; namely the company's desire to raise public equity capital, while the auditor is concerned whether the firm is even going to exist in the near future (Willenborg & McKeown, 2001).

2.4. *IPO initial returns and GCO*

According to prior research, the terms underpricing and first day initial returns are used interchangeably (Ritter & Welch, 2002). Beatty and Ritter (1986) argue that the level of underpricing is higher when IPOs have higher information asymmetry, and that IPOs could face a lemons problem when investors cannot be certain whether an issuing company is leaving money on the table. The lemons problem could be solved if an intermediary vouches for the value of securities in an IPO. An example of an intermediary is an auditor. Before a firm decides to go public, an auditor must attest to the financial information. The auditor's attestation results in a reduction of information asymmetry between investors and the owners of the firm that goes public, lowering the owners' cost of the initial underpricing of securities (Hogan, 1997).

According to Ritter (1984), the underpricing of IPOs is larger in case of high-risk IPOs. One could argue that IPOs that received a GCO are of higher risk than IPOs that have not received a GCO (Amin, Krishnan, & Yang, 2014). Hence, IPOs that receive a GCO lead to higher information asymmetry. Beatty and Ritter (1986) argue, on the other hand, that underpricing is lower in case of going-concern IPOs. Next to that, GCOs contain private information in the sense that it supports investors in their estimate of the value of the firm that is planning to go public. In other words, the accuracy of stock price valuation is improved by a GCO. Thus, the ex ante uncertainty surrounding GCO IPOs is lower than for non-GCO IPOs (Willenborg & McKeown, 2001). Willenborg and McKeown's (2001) view is supported by Matanova et al. (2019), who argue that the level of information asymmetry is higher in IPOs, as information about a private company's operations is restricted. Thus, by including a GCO in IPO filings, auditors can communicate their concerns to potential investors and other market participants. Therefore, GCOs ensure that more material information reaches the market, which should result in less underpricing. Given these conflicting arguments, the hypothesis is formulated in the null form:

H1: *The first day initial returns of IPOs are not associated with the issuance of a going-concern audit opinion.*

3. Sample Selection and Research Design

3.1. *Sample Selection*

The sample selection procedure for IPOs is outlined in Panel A of Table 1. The initial sample period is 2011 until 2021 and consists of IPOs from Audit Analytics. The IPO dataset already contains the offer price and gross proceeds. Furthermore, the IPOs had to match certain criteria to make the sample. Only North American IPOs are considered, which had to have an offer price of minimum 5 U.S. Dollars (USD), since this study focuses on regular and large-

sized IPOs and Matanova et al. (2019) used an offer price of minimum 5 USD as cut-off value for regular IPOs. These sample selection criteria ensured a sample of 1,781 IPOs. Closing prices are obtained from CRSP. The next step is to determine which IPOs had a GCO. This information is obtained from Audit Analytics. The choice of auditor is already in the IPO dataset from Audit Analytics via WRDS. All the necessary elements for the other control variables used in this research are obtained from Audit Analytics and Compustat via WRDS as well.

Table 1. Sample Selection

Panel A: Sample Selection for IPOs	
North American IPOs, that have an offer price of minimum 5 USD between 2011-2021	1,781
Less: those that are not available in CRSP	(29)
Less: those where IPO year does not match year first day closing price	(101)
Less: those that are not available in AuditAnalytics	(209)
Less: those that are not available in Compustat	(19)
Less: firms with SIC codes between 6000 and 6999	(217)
Less: those with missing values on any of the (control) variables	(168)
Number of IPOs	**1,038**

Panel B: Yearly Distribution of Non-GCO and GCO IPOs Sample

Year	Non-GCO	GCO	Total
2011	64	1	65
2012	80	1	81
2013	121	2	123
2014	149	5	154
2015	92	3	95
2016	56	3	59
2017	79	3	82
2018	90	11	101
2019	80	8	88
2020	123	5	128
2021	60	2	62
Total	994	44	1,038

Panel C: Industry Distribution of Non-GCO and GCO IPOs Sample

Industry	Non-GCO	GCO	Total
Agriculture, Forestry and Fishing	4	0	4
Mining	43	0	43
Construction	7	0	7
Manufacturing	507	35	542
Transportation, Communications, Electric, Gas and Sanitary Service	56	1	57
Wholesale Trade	21	0	21
Retail Trade	64	2	66
Services	286	6	292
Total	988	44	1,032

Panel A details the sample selection process for IPOs. Panel B provides the yearly distribution of non-GCO and GCO IPOs. Panel C shows the industry distribution of non-GCO and GCO IPOs. The IPOs are classified by their SIC code.

The datasets from the four different databases are merged based on the unique Central Index Key (CIK) codes. At first, 29 IPOs are excluded as they are not covered by CRSP. Next to that, 101 IPOs are deleted because the year in which the IPO takes place does not match the year of the first day closing price of the IPO. After that, 209 IPOs are deleted because these IPOs are not covered by AuditAnalytics and 19 IPOs are deleted as they are not included in Compustat. Furthermore, 217 IPOs with a SIC code between 6000 and 6999 are excluded (e.g. financial institutions, real estate investment trusts, spin-offs, limited partnerships, closed-end funds) (Matanova et al., 2019). Lastly, 168 IPOs are deleted because they had missing values on any of the (control) variables. Thus, this results in a sample of 1,038 IPOs. The yearly and industry distribution of non-GCO and GCO IPOs is depicted in Panel B and C of Table 1, respectively. The industry distribution is based on the Standard Industrial Classification (SIC) code. There were six missing values in this variable. Hence, that is why six firms are not classified in an industry in Panel C, Table 1. Most IPOs in the sample are classified in the manufacturing or services industry. In addition, almost all GCO IPOs are in the manufacturing industry.

When looking at Panel B of Table 1, it becomes clear that the number of IPOs is substantially lower in 2021 compared to the previous years. A possible reason for this is that 59 percent of all IPOs in 2021 were Special Purpose Acquisition Companies (SPACs), which was a record year for these type of IPOs (Mackintosh, 2022). SPACs raise funds via an IPO. After that, a SPAC must find a private firm to merge with, and thereby bringing that firm public as well, within two years after going public. The great benefit of SPACs is that the shareholders have the choice to reclaim their shares instead of taking part in the merger when the SPAC and the target enter into a merger agreement. Therefore, IPO investors experience no risk. A SPAC dissolves and returns all cash, including interest, to its shareholders if it is unable to consummate the merger within the two years that make up its average lifespan. In addition, SPACS have gained popularity in the past three years. Firms opt to go public through a SPAC rather than through a standard IPO. SPAC enthusiasts frequently claim that merging with another SPAC is a less expensive way to go public than doing so via an IPO (Klausner, Ohlrogge, & Ruan, 2022). However, as SPACs are a different type of IPO and are not the focus in this research, they are excluded from the sample, resulting in a smaller number of IPOs in 2021.

3.2. *Research Design*

This thesis constitutes of empirical archival research, where IPOs are studied with and without a GCO. This study uses an ordinary least squares (OLS) regression to test whether GCOs in IPOs reduce information asymmetry. This results in the following model:

$$InitialReturn = \beta_0 + \beta_1 GCO + \beta_2 Big5 + \beta_3 RecOfferPrice + \beta_4 ROA \quad (1)$$
$$+ \beta_5 OCF\_TA + \beta_6 NYSE\_AMEX + \beta_7 LnProceeds + \beta_8 LnSIZE + \varepsilon$$

As information asymmetry cannot be observed, first day initial returns will serve as a proxy (Ma, 2007). In model 1, *InitialReturn* is the dependent variable, and it shows the level of information asymmetry, measured by the first day initial returns in IPOs. Thus, *InitialReturn* is a continuous variable. First day initial returns are calculated by subtracting the IPO offer price from the closing price on the first day of public trading, divided by the IPO offer price (Willenborg & McKeown, 2001). This results in the following formula:

$$InitialReturn = \frac{Closing\ price - IPO\ offer\ price}{IPO\ offer\ price} \quad (2)$$

Investors demand higher profits as remuneration for uncovering previously unknown information and accepting uncertainty as a risk (Welch, 1989). So, when the information asymmetry is greater, the first day returns should be higher (Ma, 2007). *GCO* is the independent variable of interest. It is an indicator variable which takes the value of one when the IPO has a GCO on the private-company financial statements, and zero otherwise.

Model 1 includes several control variables as well. In total, seven control variables are used in this research. The model in this research is partly derived from the Initial Return Models of Willenborg & McKeown (2001), Willenborg, Wu & Yang (2015) and Matanova et al. (2019). It is important to note that this thesis does not include all control variables used by Willenborg & McKeown (2001), Willenborg, Wu & Yang (2015) and Matanova et al. (2019). The reason for this is that the variables were either too difficult or too time consuming to obtain. Furthermore, Willenborg & McKeown (2001), Willenborg, Wu & Yang (2015) and Matanova et al. (2019) took the time to hand-collect some of their data from the IPO prospectus, which is not manageable in the time frame for this research.

The first control variable that is included is *Big5*, which is an indicator variable that measures whether the IPO firm is audited by a Big 5 auditor. *Big5* equals one when the IPO firm is audited by a Big 5 auditor, and zero otherwise. This variable is added to control for the effects of the choice of auditor on the first day initial returns (Matanova et al., 2019). Following Willenborg & McKeown (2001), the reciprocal is taken of the IPO offer price per share to

control for share-price effects. *RecOfferPrice* is a continuous variable and is measured the following way:

$$RecOfferPrice = \frac{1}{IPO\ offer\ price} \quad (3)$$

Other control variables that are included are the ones that control for a firm's financial health pre-IPO: profitability, which is measured by the return on asset (ROA), and operating cash flows scaled by total assets. The model also controls for the type of market, where the IPO went public (Willenborg, Wu & Yang, 2015). *ROA* and *OCF_TA* are both continuous variables, and are calculated using formula 4 and 5, respectively. *NYSE_AMEX* is an indicator variable, which equals one if the IPO is listed on NYSE or AMEX, and zero otherwise.

$$ROA = \frac{pre{-}IPO\ net\ income}{pre{-}IPO\ average\ total\ assets} \quad (4)$$

$$OCF\_TA = \frac{pre{-}IPO\ operating\ cash\ flow}{pre{-}IPO\ average\ total\ assets} * 100\ \% \quad (5)$$

Following Willenborg & McKeown (2001), the model also controls for the gross proceeds of the IPO, which are measured by the continuous variable *LnProceeds*. *LnProceeds* is calculated by taking the natural logarithm of the gross proceeds. Pre-IPO total assets are used to control for the size of the firm, which is measured by the continuous variable *LnSIZE*. *LnSIZE* is defined as the natural logarithm of the pre-IPO total assets (Willenborg & McKeown, 2001). By taking the natural logarithm of variables, the probability of big outliers is reduced as the natural logarithm ensures a smaller variance in the variable (Stock & Watson, 2010). For all control variables, it holds that pre-IPO means the year before the IPO takes place. Hence, all control variables are calculated in period *t-1*, where *t* is the year that the IPO takes place. The average total assets are calculated using the total assets of *t-1* and *t-2*.

4. Empirical Results

4.1. *Descriptive Statistics*

Table 2, Panel A provides descriptive statistics for non-GCO IPOs, GCO IPOs, IPOs as well as the difference in means between non-GCO IPOs and GCO IPOs. Several matters become clear from looking at the results from Panel A in Table 2. First, the average offer and first day closing price of non-GCO IPOs are significantly higher compared to GCO IPOs. This results in the initial returns of the average non-GCO IPO (23.75%) being significantly larger than the initial returns of the average GCO IPO (3.58%). These findings present initial results in support of the findings of Willenborg & McKeown (2001) as well as Matanova et al. (2019). They both found that GCOs enhance pricing accuracy in IPOs, which suggests that there is less ex ante uncertainty surrounding GCO IPOs compared to non-GCO IPOs. In other words,

reducing the first day underpricing. What also has become clear thus far is that it is difficult to set the IPO price. The market as well as the issuing company do not have enough information. The market is unsure about the IPOs' quality, while the issuing company has its doubts concerning the market's demand for its shares. Thus, issuing firms entrust the setting of the offer price to underwriters. Next to that, underwriters are strongly incentivized to establish themselves as valuation authorities and attest that the offer price accurately reflects the fundamental value of the IPO as they frequently bring companies public (Roosenboom, 2007). Hence, it can be deduced that GCOs probably provide information content, which is useful for underwriters when setting the offer price of the IPO. This, in turn, helps underwriters in estimating the fundamental value of the IPO, which results in lower underpricing in GCO IPOs compared to non-GCO IPOs.

More often, the average non-GCO IPO has an auditor from a Big 5 firm audit their private-company financial statements compared to GCO IPOs. Hence, GCO IPOs are audited by less reputable auditing firms as opposed to non-GCO IPOs (Matanova et al., 2019). The reciprocal of the IPO offer price per share of the average non-GCO IPO is lower compared to GCO IPOs. Furthermore, the ROA and operating net cash flows of the average non-GCO IPO are higher than the ROA and operating net cash flows of the average GCO IPO. Next to that, the average non-GCO IPO is more often listed on NYSE or AMEX compared to the average GCO IPO and the gross proceeds of the average non-GCO IPO are higher than the gross proceeds of the average GCO IPO. Lastly, the average GCO IPO is significantly smaller in size than a non-GCO IPO. All differences are statistically significant at a 1 percent level. These results are pretty intuitive as the firm would probably not receive a GCO if the pre-IPO net income, total assets, operating net cash flows scaled by total assets and gross proceeds were sufficiently high to survive in the near future.

The correlation matrix is depicted in Panel B of Table 2. At first glance, it becomes clear that *GCO* is negatively correlated with *InitialReturn*, and that the correlation between these variables is highly significant. Thus, these initial results suggest that GCOs reduce the initial returns of IPOs, indicating that GCOs reduce information asymmetry. Furthermore, the correlations coefficients between the control variables are mostly around or under 0.3, with a few exceptions. The correlation between *LnProceeds* and *LnSIZE* is the highest of all variables, with a correlation coefficient of 0.88. Furthermore, the correlations between *RecOfferPrice* and *LnProceeds* and *LnSIZE* are relatively high. The correlation coefficient of *OCF_TA* and *ROA* is also relatively high. However, some of these higher correlation coefficients are not entirely surprising, since the average total assets are used to calculate *ROA* and *OCF_TA*. Lastly, it is

noteworthy to mention that all correlation coefficients are statistically significant, with the exception of the correlation coefficient between *InitialReturn* and *Big5*. Overall, multicollinearity does not seem to be a problem in this research, as none of the variables is perfectly correlated with another variable.

Table 2. Descriptive Statistics and Correlation Matrix (N = 1,038)

Panel A: Descriptive Statistics: means and standard deviations

	(a) Non-GCO IPOs		(b) GCO IPOs		(c) Total		(d) = (a-b) Mean	
Variable	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Offer Price	16.76	8.40	9.32	4.08	16.45	8.40	7.45***	1.27
Closing price	21.38	15.64	9.46	6.31	20.88	15.54	11.92***	2.37
InitialReturn	0.24	0.38	0.04	0.83	0.23	0.41	0.20***	0.06
GCO	-	-	-	-	0.04	0.20	-	-
Big5	0.88	0.33	0.45	0.50	0.86	0.35	0.42***	0.05
RecOfferPrice	0.07	0.03	0.13	0.05	0.07	0.04	-0.06***	0.01
ROA	-0.58	2.61	-2.81	4.08	-0.67	2.73	2.23***	0.42
OCF_TA	-0.28	0.87	-1.48	1.70	-0.34	0.95	1.19***	0.14
NYSE_AMEX	0.36	0.48	0.05	0.21	0.34	0.48	0.31***	0.07
LnProceeds	18.77	1.05	17.11	1.20	18.70	1.11	1.66***	0.16
LnSIZE	5.78	1.45	3.37	1.49	5.68	1.53	2.41***	0.22

Panel B: Correlations

Variables		(1)	(2)	(3)	(4)	(5)
InitialReturn	(1)					
GCO	(2)	-0.01***				
Big5	(3)	0.04	-0.25***			
RecOfferPrice	(4)	-0.14***	0.33***	-0.42***		
ROA	(5)	0.08**	-0.16***	0.24***	-0.27***	
OCF_TA	(6)	0.07**	-0.25***	0.23***	-0.34***	0.67***
NYSE_AMEX	(7)	-0.06*	-0.13***	0.15***	-0.27***	0.16***
LnProceeds	(8)	0.11***	-0.30***	0.42***	-0.73***	0.27***
LnSIZE	(9)	0.05*	-0.32***	0.39***	-0.64***	0.29***

		(6)	(7)	(8)
NYSE_AMEX	(7)	0.28***		
LnProceeds	(8)	0.35***	0.40***	
LnSIZE	(9)	0.42***	0.44***	0.88***

Panel A shows the descriptive statistics of each variable used in this research. *InitialReturn* is calculated using the offer and first day closing prices of IPOs. Thus, the descriptive statistics for the components of *InitialReturn* are provided as well, for clarification purposes. The statistical significance for the means is based on a t-test. ***, **, and * indicate the statistical significance of the difference (two-tailed) between the means of non-GCO and GCO IPOs at levels of 1, 5, and 10 percent, respectively. Panel B depicts a correlation matrix. ***, **, and * illustrate the levels of statistical significance at 1, 5, and 10 percent, respectively. The definition of each variable as well as some additional information on the ten biggest non-GCO and GCO IPOs in the sample, can be found in Appendix A, B and C, respectively.

4.2. *Multivariate Regression Analysis Using Full Sample*

Table 3 presents the results of the multivariate regression analysis using the full sample. In the information asymmetry analysis *InitialReturn* is the dependent variable, which is calculated by subtracting the IPO offer price from the first day closing price, divided by the IPO offer price. *GCO* is the independent variable of interest. This research finds that the coefficient of *GCO* is negative and insignificant. Hence, there is not enough evidence to either accept or reject the null hypothesis. These results suggest that, in line with Hypothesis 1, GCOs are not associated with the first day initial returns of firms that go public, ceteris paribus. Thus, GCOs do not affect the level of information asymmetry in this research and do not provide valuable information to investors that reduces the information gap between them and the managers of the firms that go public.

The results in this study do not provide support for the findings of Willenborg & McKeown (2001) and Matanova et al. (2019). They both found that GCOs provide useful information to market participants. Next to that, these results are not in support of Ritter's (1984) findings. Ritter (1984) found that the underpricing is larger in case of high-risk IPOs. As IPOs with a GCO on their private-company financial statements present a higher risk for investors, GCO IPOs should increase the information asymmetry compared to non-GCO IPOs. However, this research does not find results in support of this view.

Table 3. Information Asymmetry Analysis (Full Sample)

	(1) *InitialReturn*	
Variable	Coeff.	p-value
Intercept	-0.673	0.185
GCO	-0.137	0.266
Big5	-0.044	0.306
RecOfferPrice	-1.252	0.087*
ROA	0.005	0.214
OCF_TA	0.017	0.419
NYSE_AMEX	-0.091	0.000***
LnProceeds	0.072	0.019**
LnSIZE	-0.047	0.020**
N	1,037	
Adj-R^2	0.035	

This table reports the regression results of GCOs on the initial returns of firms after their IPO. The dependent variable is *InitialReturn* and the independent variable of interest is *GCO* (marked light grey). ***, **, * indicate the statistical significance (two-tailed) at the percentage levels of 1, 5, and 10, respectively. The p-value is the probability that the t-test statistic of a specific coefficient is different from zero, under the null hypothesis. The variables are defined in Appendix A.

The reasons behind the insignificant coefficient of *GCO* may be due the fact that this research uses a different combination and less control variables compared to the above-

mentioned studies. Also, the ratio GCO and non-GCO IPOs in this thesis differs from the research of Willenborg & McKeown's (2001) as well as Matanova et al. (2019), which had circa 24 and 9 percent GCO IPOs in the sample, respectively. This research, however, has 4 percent GCO IPOs. Lastly, Matanova et al. (2019) use industry and year fixed effects and interaction effects to test the underpricing of IPOs, while this thesis does not. The differences in research method and models might contribute to the insignificant results of the *GCO* coefficient on *InitialReturn*. On the other hand, it might be due to the conflicting effects of GCOs on the first day initial returns of IPOs. Namely, that GCOs provide valuable information which results in a decrease in underpricing or that the underpricing is higher because GCO IPOs are riskier or due to the type of auditor that provided the GCO. Hence, an additional analysis is performed in section 4.3 to research whether a GCO provided by a Big 5 auditor reduces the information asymmetry in IPOs.

When looking at the other results in Table 3, four control variables are significant. At first it is noticeable that the coefficient of *RecOfferPrice* is negative and statistically significant at the one percent level. This result is not in line with the findings of Willenborg & McKeown (2001). They found that the reciprocal of the IPO offer price has a positive association with the first day initial returns, ceteris paribus. Furthermore, *LnProceeds* is positively associated with the first day initial returns of IPOs. *LnSIZE* has a negative and significant coefficient as well. Both these results are surprising since Willenborg & McKeown (2001) did not find significant results for these variables. Although Willenborg, Wu & Yang (2015) found a negative coefficient for *NYSE_AMEX*, it was not significant. Nevertheless, this thesis finds that the coefficient of *NYSE_AMEX* is negatively associated with the initial returns and is highly significant.

4.3. *Additional Analysis Using Big 5 Sub-Sample*

Since the main model in this research did not produce significant results, an additional model is tested using a sub-sample. The sub-sample consists only of IPOs, which are audited by a Big 5 audit firm. Eshleman and Guo (2014) believe that a Big 4 auditor provides higher quality audits than a non-Big 4 auditor, due to the fact that they are bigger and have access to more resources to devote to their training programs than smaller audit firms. Hence, Big 4 audit firms are able to train future auditors better than non-Big 4 audit firms. Furthermore, bigger audit firms have more to lose reputation wise, resulting in Big 4 audit firms being more conservative in the publication of audit reports. Therefore, GCOs provided by a Big 4 auditor might have more information content than GCOs provided by a non-Big 4 auditor. As this

research uses a Big 5 instead of a Big 4 indicator variable following Matanova et al. (2019), the line of reasoning above is applied to a Big 5 sub-sample.

Table 4. Information Asymmetry Analysis (Big 5 Sub-Sample)

	(1) *InitialReturn*	
Variable	Coeff.	p-value
Intercept	-0.290	0.590
GCO	-0.146	0.005***
RecOfferPrice	-2.705	0.002***
ROA	0.004	0.883
OCF_TA	0.019	0.561
NYSE_AMEX	-0.094	0.000***
LnProceeds	0.051	0.111
LnSIZE	-0.034	0.095*
N	891	
Adj-R^2	0.059	

This table reports the regression results of GCOs on the initial returns of firms after their IPO. The regression is based on a sub-sample containing only IPOs, which are audited by a Big 5 audit firm. The dependent variable is *InitialReturn* and the independent variable of interest is *GCO* (marked light grey). ***, **, * indicate the statistical significance (two-tailed) at the percentage levels of 1, 5, and 10, respectively. The p-value is the probability that the t-test statistic of a specific coefficient is different from zero, under the null hypothesis. The variables are defined in Appendix A.

Table 4 presents the results of the multivariate regression analysis using the Big 5 sub-sample. In the information asymmetry analysis *InitialReturn* is the dependent variable and *GCO* is the independent variable of interest. This study finds that the coefficient of *GCO*, using the Big 5 sub-sample, is negative and highly significant. When IPOs are audited by a Big 5 auditor and have a GCO on their private-company financial statements, the information asymmetry reduces with 14.6 percent, ceteris paribus. Hence, there is enough evidence to reject the null hypothesis at the 1 percent level. These results suggest that GCOs, provided by a Big 5 audit firm, are negatively associated with the first day initial returns of firms that go public, ceteris paribus. Hence, GCOs provided by Big 5 audit firms affect the level of information asymmetry in the sense that they reduce the information asymmetry in IPOs. Thus, GCOs on the private-company financial statements by a Big 5 audit firm provide valuable information to investors, which reduces the information gap between them and the managers of the firms that go public, which is not in line with Hypothesis 1. Although Willenborg & McKeown (2001) and Matanova et al. (2019) did not distinguish between the type of auditor, they also found that GCO IPOs are negatively associated with the first day initial returns of IPOs.

When looking at the other results in Table 4, three control variables are also significant. The coefficient of *RecOfferPrice* is negative and highly significant, just like in the full sample.

Again, *NYSE_AMEX* has a negative and highly significant coefficient. Lastly, the coefficient of *LnSIZE* is negative and significant.

5. Conclusion

This study investigates whether GCOs have an effect on the level of information asymmetry in IPOs. This thesis does not find significant results using the full sample. Hence, the full sample results show that GCOs have no effect on the level of information asymmetry in IPOs. These results are inconsistent with prior research (Willenborg & McKeown, 2001; Matanova et al., 2019). Therefore, an additional analysis is performed using a sub-sample consisting of IPOs which are audited by Big 5 auditors only. The sub-sample results show that GCOs by a Big 5 audit firm, are negatively associated with the level of information asymmetry. Thus, these results suggest that GCOs given by a Big 5 auditor provide valuable information to investors and reduce the level of information asymmetry in IPOs.

This research provides useful policy implications. First, while prior research suggests that GCOs reduce the underpricing in IPOs, the evidence from the full sample does not provide support for this notion. On the other hand, the evidence in this study indicates that only GCOs provided by a Big 5 auditor reduce the information asymmetry in IPOs. These findings suggest that firms that would like to go public, should hire a Big 5 audit firm if they would like to reduce the information gap between the investors and managers of the firm. Thus, this thesis emphasizes the importance of a larger firm for the audit of the financial statements. Furthermore, it highlights that GCOs provided by a Big 5 auditor help in distributing valuable information across market participants in IPOs.

The study is subject to certain caveats. First, prior researchers used more control variables in their models. However, lots of these control variables were hand-collected. Therefore, it was hard to obtain these variables in the given time frame for this research. This research might be subject to omitted variable bias as it did not add all variables which potentially affect the first day initial returns, next to the GCOs. In addition, the ratio GCO and non-GCO IPOs is smaller compared to the ratio GCO and non-GCO IPOs used by Willenborg & McKeown (2001) and Matanova et al. (2019). This might contribute to the insignificant results of the effect of GCOs on the level on information asymmetry using the full sample. Lastly, the first day initial returns of IPOs are used as a proxy for information asymmetry. However, these types of returns are also used as a proxy for underpricing (Willenborg & McKeown, 2001; Matanova et al., 2019). As the first day initial returns are used to capture more

than one effect, it is difficult to distinguish between these two effects. An idea for future research is, therefore, to think of another proxy for information asymmetry.

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Appendix A: Variables Included in Information Asymmetry Analysis

Variables	**Definition**
InitialReturn	Closing price less the offer price divided by the offer price.
GCO	Indicator variable equal to one if the IPO received a going concern opinion on the private-company financial statements, and zero otherwise.
Big5	Indicator variable equal to one if the IPO was audited by a Big 5 audit firm, and zero otherwise. The following auditors are considered to be Big 5 auditors: PricewaterhouseCoopers LLP, Ernst & Young LLP, KPMG LLP, Deloitte & Touche LLP and Grant Thornton LLP.
RecOfferPrice	The reciprocal of the IPO offer price per share.
ROA	Return on assets, defined as the pre-IPO net income divided by the pre-IPO average total assets.
OCF_TA	Operating cash flows scaled by total assets, defined as pre-IPO operating activities net cash flow divided by average total assets.
NYSE_AMEX	Indicator variable equal to one if the IPO is listed on either NYSE or AMEX, and zero otherwise.
LnProceeds	Gross proceeds of the IPO, measured by the natural logarithm of the gross proceeds of the IPO.
LnSIZE	Size of the IPO, measured by the natural logarithm of the pre-IPO total assets.

Appendix B: Ten Largest Non-GCO IPOs in Sample and Additional Information

Company	IPO Date	Gross Proceeds	IPO Offer Price	First Day Closing Price	First Day Initial Returns
Meta Platforms, Inc.	18/05/2012	16.01	38.00	38.23	0.61
Uber Technologies, Inc	10/05/2019	8.10	45.00	41.57	-7.62
HCA Healthcare, Inc.	09/03/2011	3.79	30.00	31.02	3.40
Airbnb, Inc.	10/12/2020	3.51	68.00	144.71	112.81
Snap, Inc.	02/03/2017	3.40	17.00	24.48	44.00
DoorDash, Inc.	09/12/2020	3.37	102.00	189.51	85.79
Snowflake, Inc.	16/09/2020	3.36	120.00	253.93	111.61
Avantor, Inc.	17/05/2019	2.90	14.00	52.75	276.79
Kinder Morgan, Inc.	10/02/2011	2.86	30.00	31.05	3.50
Plains GP Holdings LP	15/10/2013	2.82	22.00	22.00	0.00

This table consists of additional information on the ten biggest non-GCO IPOs in the sample used in this research. The ten biggest non-GCO IPOs are selected based on not having received a GCO on their private-company financial statements and their gross proceeds. The gross proceeds are in billion USD, the IPO offer price and first day closing price are in USD and the first day initial returns are in percentages.

Appendix C: Ten Largest GCO IPOs in Sample and Additional Information

Company	IPO Date	Gross Proceeds	IPO Offer Price	First Day Closing Price	First Day Initial Returns
Terraform Global, Inc.	31/07/2015	0.68	15.00	14.00	-6.67
Biohaven Pharmaceutical Holding Co Ltd.	04/05/2017	0.17	17.00	17.50	2.94
Violin Memory Inc.	26/09/2013	0.16	9.00	7.02	-22.00
Apellis Pharmaceuticals, Inc.	09/11/2017	0.15	14.00	14.03	0.21
Urovant Sciences Ltd.	27/09/2018	0.14	14.00	11.65	-16.79
Intra-Cellular Therapies, Inc.	19/12/2013	0.14	6.35	10.00	57.48
Solid Biosciences, Inc.	26/01/2018	0.13	6.00	22.62	41.38
Translate Bio, Inc.	28/06/2018	0.12	13.00	11.52	-11.38
Progenity, Inc.	19/06/2020	0.10	15.00	13.12	-12.53
Graybug Vision, Inc.	25/09/2020	0.09	16.00	16.50	3.13

This table consists of additional information on the ten biggest GCO IPOs in the sample used in this research. The ten biggest GCO IPOs are selected based on having received a GCO on their private-company financial statements and their gross proceeds. The gross proceeds are in billion USD, the IPO offer price and first day closing price are in USD and the first day initial returns are in percentages.