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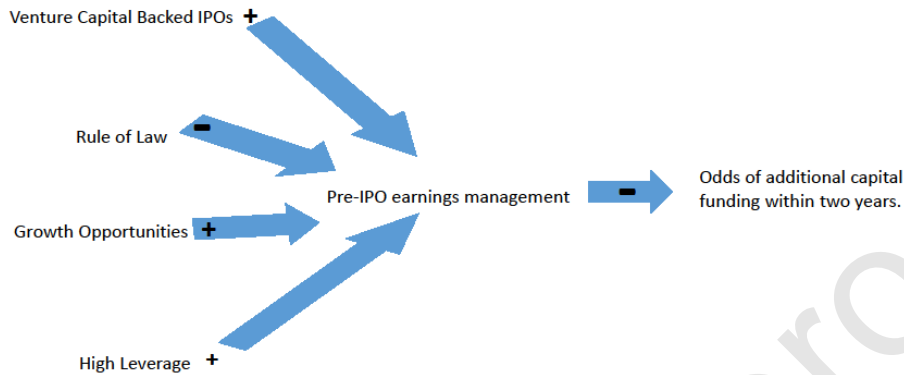
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Graphical abstract

Venture Capital Backed IPOs **+**

Rule of Law **–**

Growth Opportunities **+**

Pre-IPO earnings management

– Odds of additional capital funding within two years.

High Leverage **+**

Abstract

We analyze a sample of 3,293 IPOs from 29 countries to investigate the firm, industry, and country characteristics related to earnings management during the IPO process. We find that IPO firms tend to have significantly positive discretionary accruals (DCA) both prior to and after the IPO, suggesting that IPO firms tend to engage in pre-IPO earnings management. However, we also find that using a proxy for earnings management in the IPO year may lead to biased conclusions concerning pre-IPO earnings management. Firms that are more likely to need access to capital markets in the future (firms with high leverage, and firms backed by a venture capitalist) are less likely to engage in pre-IPO earnings management. Firms operating in countries with a superior rule of law are also less likely to engage in earnings management. Lastly, we find that firms may engage in pre-IPO earnings management in part to avoid returning to the capital markets to raise more funds (capital market staging). This result is robust to possible endogeneity bias stemming from management self-selection.

1. **Introduction**

The IPO setting provides both a motive and an opportunity for companies to manage earnings. Given that the original owners have a large stake in the firm, gaining an inflated offer price significantly increases their wealth. The opportunity to manage earnings results from the opacity that surrounds a private firm, making it difficult for investors to detect the degree of earnings management. Additionally, the extreme transition occurring during the IPO process further obscures the interpretation of the financial data. Consistent with these arguments, studies have shown that some IPO firms engage in earnings management and that these firms can extract benefits from investors. For example, Teoh, Welch, and Wong (1998a) show that IPO firms with the highest discretionary accruals (DCA) significantly underperform after the IPO. Similarly, DuCharme, Malatesta, and Sefick (2001) find that IPO firms with higher accruals receive higher valuations.

Conversely, the high scrutiny the IPO firm receives provides strong incentives for managers to report earnings conservatively. Thus, managers would not engage in opportunistic earnings management (Ball and Shivakumar, 2008 and Armstrong, Foster, and Taylor, 2015). Similarly, Ljungqvist (2007) argues that pre-IPO earnings management increases the firm's information asymmetry leading to more underpricing of the offer. This would result in the opposite effect that management would be seeking from engaging in earnings management.

The conflicting empirical findings, as well as differing theoretical explanations, suggest that, while well researched, this topic deserves further investigation. From a practitioner's viewpoint, if certain characteristics are highly related with earnings management, then the investor can make better and more rational investment decisions. However, detecting earnings management during the IPO is difficult, especially for retail investors.

Gao, Meng, Chan, and Wu (2017) show that institutional investors can detect the degree of pre-IPO earnings management to some extent; however, retail investors cannot. Given the difficulty that investors face in detecting pre-IPO earnings management and the negative consequences of pre-IPO earnings management, this study aims to help investors to better identify the companies that are more likely to engage in pre-IPO earnings management. Specifically, by studying a large sample of international IPOs, we attempt to identify which company characteristics are associated with a higher degree of pre-IPO earnings management.

Using a large international sample of IPOs has several advantages. First, an international sample allows us to better understand how different accounting and legal standards can help deter the practice of pre-IPO earnings management. Second, a large international sample allows us to use the discretionary current accruals (DCA) in the pre-IPO year (year -1, hence DCA_{-1}) to estimate the degree of earnings management. Due to limited pre-IPO financial data, most studies use the DCA in the year of the IPO (DCA_0) as the proxy for pre-IPO earnings management. Ball and Shivakumar (2008) argue that DCA_0 is a biased proxy of pre-IPO earnings management. DCA_{-1} is a more direct measure of pre-IPO earnings management[1], and it is immune from most of the criticism that applies to the DCA_0. Lastly, a large international sample allows us to compare DCA_0 and DCA_{-1} and contribute to the debate on whether DCA_0 is a biased measure of pre-IPO earnings management.

Consistent with Teoh et al. (1998a), we find that IPO firms do engage in pre-IPO earnings management. The DCA_{-1} in our sample is significantly positive. However, consistent with Ball and

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[1] These are the earnings that the IPO investors have access in the prospectus and during the road show process when evaluating the IPO.

Shivakumar (2008), we find that DCA_0 is a biased proxy for a firm's pre-IPO earnings management. Our results show that DCA_0 is significantly larger than DCA_{-1} across all measures.

We find that firms that will need future access to the capital markets (firms with higher leverage and venture-backed firms) are less likely to engage in pre-IPO earnings management. We observe mixed findings between firm growth options and earnings management during the pre-IPO process. The presence of a strong legal framework also provides a strong disincentive for earnings management. Firms from countries with a strong rule of law are also less likely to manage earnings before the IPO. It appears if the consequences of being caught are minimal (weak rule of law), managers will engage in earnings management.

Lastly, we find that the probability that a firm returns to the public markets within two years is significantly lower for firms with a greater degree of pre-IPO earnings management. This result suggests that IPO firms may engage in earnings management to raise more funds and avoid public capital market staging. It also further corroborates our result that firms that will need future access to capital markets are less likely to engage in earnings management. It appears that managers who engage in pre-IPO earnings management may benefit in two ways: by attaining a higher IPO price and by avoiding the increased monitoring of capital market staging. This result holds after controlling for endogeneity bias.

This paper contributes to the literature in several ways. First, to the best of our knowledge, this is the first paper that attempts to identify the characteristics of companies that are more likely to engage in pre-IPO earnings management in a global setting. In addition, to the best of our knowledge, this is the first paper that documents that companies may engage in earnings management to avoid capital markets staging. Lastly, this paper contributes to the debate on whether DCA_0 is a biased proxy for pre-IPO earnings management. The findings of this paper can

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benefit investors by helping them identify and avoid the companies that are more likely to engage in pre-IPO earnings management. Such an understanding could also help investors take legal action against IPO firms that engage in earnings management. Billings and Lewis-Western (2016) find that investors employ litigation to recover losses stemming from inflated accruals during the IPO process. The findings of this paper can also be beneficial to regulators. A better understanding of the role that accounting standards and legal systems play in deterring managers from managing earnings can help policymakers in setting better standards and investors in being more cautious of IPOs from certain countries.

2. Literature Review

2.1.   Pre-IPO earnings management

How earnings management influences investment decisions and investment outcomes is a core research topic, which spans in the accounting and finance literature. Earnings management during the IPO process is an important sub-topic of this literature. Before a firm goes public, the information asymmetry between management and investors is high. Agency theory suggests that in an environment with high information asymmetry and low monitoring, managers may take advantage of the shareholders without any significant ramifications (Jensen and Meckling, 1976). Some IPO managers may attempt to take advantage of the relatively high level of information asymmetry and manage earnings to extract the largest private benefits from the issuance. This action would increase the manager's and other private investors' wealth, but at the expense of the new public investors.

Investors are aware of these incentives of the IPO managers and may attempt to predict the level of earnings management *ex-ante;* however, studies show that investors may be unable to detect such practice. Teoh et al. (1998a) report that IPO firms have significantly positive DCA in

the year of the IPO and that firms with the highest level of DCA had the worst performance after the IPO. Teoh, Welch, and Wong (1998b) find that firms with higher accruals prior to a seasoned equity offer (SEO) have significantly lower performance after the SEO. These findings support the opportunism theory, as the subsequent IPO underperformance implies a mispriced IPO. If firms are able to engage in this opportunistic behavior, it is largely due to a lack of information surrounding the IPO process. Weber and Willenborg (2003) consider the ability of professional accountants in shedding light into the accounting quality during the IPO process. They report a strong correlation between subsequent stock price performance and the auditor's opinion.

Several other studies report findings consistent with the "opportunistic behavior" hypothesis[2]. Givoly, Hayn, and Katz (2010) find that public firms are more likely to manage earnings compared to private firms. Premti and Madura (2013) find that IPO firms are more likely to manage their earnings during cold periods. These studies show that IPO firms benefit from managing earnings by misleading a portion of investors. However, Gao et al. (2017) find that institutional investors detect pre-IPO earnings management and they react by bidding at a lower price. This study attempts to aid investors by identify firms that are more likely to engage in pre-IPO earnings management.

Conversely, another strain of the literature argues that IPO firms are unlikely to manage earnings. Ball and Shivakumar (2008) argue that the IPO firm goes through a high level of scrutiny from the underwriter and the media, and therefore, it would be unlikely to engage in earnings management. Other studies argue that informed and intelligent investors are able to see through

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[2] While our study focuses on IPOs, opportunistic behavior is also found in other corporate events. For example, Huang, Goodell, and Zhang (2019) find that Chinese acquirers who have managed earnings take advantage of their inflated share price and are more likely to pay by stock.

possible earnings manipulation and that eroding information quality would hurt the firm in obtaining a high offer price. Ljungqvist (2007) argues that pre-IPO earnings management increases the firm's information asymmetry leading to greater underpricing. Consistent with this hypothesis, Nagata (2013) finds that firms with higher earnings management prior to the IPO have significantly higher underpricing. These findings suggest that it is better for the IPO firm to report financials accurately. Our paper contributes to this debate by investigating whether international IPO firms engage in earnings management.

Other studies have examined the characteristics of firms that are more likely to engage in pre-IPO earnings management; however, they mostly focus on the role that the venture capital (VC) and the investment bank (IB) play. For instance, Morsfield and Tan (2006) apply the Teoh et al. (1998a) methodology to a sample of 2,630 U.S. IPOs and report that the presence of a VC firm results in lower DCA_0 for the IPO firm. They interpret this as VC firms providing better monitoring over the IPO firm, thus reducing the risk of earnings management. Chang, Chung, and Lin (2010) consider the impact of the reputation of IB on the degree of earnings management. They apply the Teoh et al. (1998a) methodology to a sample of 2,053 U.S. IPOs and report that underwriter reputation also has a strong negative relationship with DCA_0. Furthermore, the link between high DCA and post-IPO underperformance concentrates in firms with low underwriter reputation. Lastly, Lee and Masulis (2011) look at IB and VC jointly. They apply the Teoh et al. (1998a) methodology to a sample of 1,346 U.S. IPOs and report that both VC and IB reputation have an inverse relationship with DCA_0. They interpret this as VC and IB monitoring act as a compliment rather than as a substitute. That is, VC and IB have an additive effect in reducing pre-IPO earnings management.

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Extending the work on the effect of VC on the degree of earnings management, Chahine, Arthurs, Filatotchev, and Hoskisson (2012) consider the makeup of VC syndicates. They find that the greater is the dispersion in VC ownership, the greater is the level of earnings management. Thus, the amount of outside monitoring the VC syndicate can provide directly influences the severity of earnings management during the IPO process. Tian, Udell, and Yu (2016) investigate the reputation damage VC firms are exposed to if they do not adequately monitor firms within their portfolio. They find that VC firms that do not adequately monitor the IPO firm have difficulty taking future firms public. Chen, Shi, and Xu (2013) find that the type of issuer ownership plays a role in the relationship between IB reputation and earnings management for Chinese firms. They report a negative relationship between IB reputation and earnings management during the pre-IPO process for non-state-owned firms, but no relationship between reputation and earnings management for state-owned firms.

Extending the role of outside monitors, Lo, Wu, and Kweh (2017) report that institutional investors may encourage a firm to engage in earnings management in the pre-IPO process, but limit earnings management once the firm has gone public. Additionally, firms with a high percentage of institutional ownership exhibit superior operating and stock return performance after the IPO. Alhadab, Clacher, and Keasey (2016) show that firms exposed to lighter regulatory environments are more likely to engage in both real and accruals-based earnings management. Gounopoulos and Pham (2017) consider the role of credit ratings on pre-IPO earnings management. They report that companies with rated debt tend not to manage earnings, while unrated firm's management does engage in earnings management.

Our paper expands on the studies mentioned above and attempts to explore the characteristics of firms that are more likely to engage in pre-IPO earnings management. In

addition, by using a large international sample of IPOs, we are able to estimate the degree of earnings management by the DCA_{-1}. Most studies related to the pre-IPO earnings management, due to lack of pre-IPO financial data, use the DCA_0 as a proxy for pre-IPO earnings management. Ball and Shivakumar (2008) argue that this is a biased proxy of pre-IPO earnings management because DCA in the IPO year are inflated by the cash infusion that the firm receives during the IPO. Similarly, Armstrong et al. (2015) show that a large percentage of elevated DCAs in the year of the IPO is due to the IPO proceeds. DCA_{-1} is not subject to such criticism, and it is a direct measure of pre-IPO earnings management.

2.2.   International considerations

Most studies investigate pre-IPO earnings management by focusing on a single country. Using an international sample allows us to examine the effect of country characteristics on the degree of pre-IPO earnings management. Several studies have shown that country characteristics have a significant effect on the development of the capital markets and on the degree of reporting quality. La Porta, Lopez-de-Silanes, Shleifer and Vishny[3] (LLSV) and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) consider country-specific legal developments and their impact on the capital markets of their home country. Other studies use these variables and report a connection between a firm's institutional environment and its capital structure[4], macro-level corporate governance[5], investor preference, and ownership structure[6]. We expand upon this literature by focusing on the effect of country characteristics on the degree of pre-IPO earnings management.

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[3]   La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997), La Porta, Lopez-de-Silanes, and Shleifer (1999), and La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000)
[4] See for instance: Demirgüç-Kunt and Maksimovic (1998), Maksimovic and Demirgüç-Kunt (1999), Antoniou, Guney, and Paudyal (2008), de Jong, Kabir, and Nguyen (2008), as well as Fan, Titman, and Twite (2012)
[5] Klapper and Love (2004), Kho, Stulz, and Wamock (2009), and Leuz, Lins, and Warnock (2008)
[6]Stulz (2005) and Boubakri, Cosset, and Guedhami (2005)

Some studies have examined the effect of country and firm characteristics on earnings quality. Ball, Kothari, and Robin (2000) examine how the firm's legal organization structure impacts earnings recognition (timeliness and conservatism) and the market prices of securities. Ali and Hwang (2000) consider the impact of country characteristics on the informational value of the accounting data, as reflected in firm stock prices from sixteen different countries. They report that differences in economic and legal structure impact the value of the information transmitted in accounting data. Leuz, Nanda, and Wysocki (2003) examine earnings quality around the world and find significant differences among countries. They conclude that the degree of earnings quality depends on the level of the country's investor protection. Bushman and Piotroski (2006) provide evidence that a country's legal system systematically affects observed accounting conservatism. They conclude that financial reporting directly influences the nature of the legal and political environment of the country in which they are domiciled. Halaoua, Hamdi, and Mejri (2017) find that earnings management in order to meet analysts' forecasts is significantly more common in countries with British accounting models compared to French accounting models. This supports the relevance of different country characteristics and the impact of these characteristics on earnings management. These findings signal that country characteristics may influence the use of earnings management during the pre-IPO process and that failing to consider country affects may lead to incorrect generalizations. Lel (2019) considers the role that large international institutional investors play in mitigating earnings management at firms with different investor protection rights. Lel's findings show that firms manage earnings to a smaller degree when these large institutional investors are part of the firm's shareholder base. This is especially true for firms domiciled in countries with weak investor protection.

In a more recent paper relating international characteristics directly to the pre-IPO process, Boulton, Smart, and Zutter (2011) examine the effect of earnings quality on IPO underpricing. They find that country-level earnings quality has an impact on the degree of IPO underpricing. Despite strong evidence that the degree of earnings management varies among countries, the degree of pre-IPO earnings management could vary within each country. Firms in a country have specific motives for going public and expect different outcomes. These motives and expectations may impact the likelihood and magnitude of pre-IPO earnings management. Given the importance of pre-IPO earnings management in predicting the long-term performance of IPO firms, it is important for investors to determine which firms are more likely to engage in earnings management. As an extension, Boulton, Smart, and Zutter (2017) find a connection between accounting conservatism and underpricing. Specifically, they report less underpricing of IPOs of firms in which existing public companies have a tendency to report more conservatively. They also present evidence that a firm's legal origin has a strong influence on the relationship between conservatism and underpricing. These findings motivate us to investigate the effect of country characteristics on the degree of pre-IPO earnings management. Wang, Anderson, and Chi (2018) consider VC connections in China and how these connections affects a firm's choice to manage earnings during the pre-IPO process, using both accrual and real earnings management. They report that government controlled VCs back firm's that have a tendency to both manage earnings and exhibit long-run underperformance following the IPO.

3. Hypotheses development

One of the goals of this paper is to help investors better detect possible earnings management during the pre-IPO process. In this section, we develop hypotheses that identify firm and country characteristics related to the management's incentives and opportunities to engage in

earnings management. We posit that the degree of pre-IPO earnings management depends on managers having the incentives and the opportunity to engage in earnings management. If investors can identify traits of firms that may engage in earnings management, they can avoid the IPOs of these firms; thus, avoiding the possible wealth transfer.

The first section explores the different incentives faced by the firm for engaging in earnings management. The second section explores the opportunities for earnings management that the firm's external environment creates.

3.1.   (Dis)incentives for earnings management

If a firm engages in earnings management by artificially boosting earnings, its earnings are likely to decline soon[7], leading to long-run underperformance. Such a firm will leave a bad impression on investors, and it is unlikely that it will be able to raise capital in the future on favorable terms. The argument is similar to the underpricing argument initiated by Ibbotson (1975): Firms underprice to leave a "good taste in investors' mouths," and they can recover the money left on the table through a later seasoned equity offering. Given that keeping investors happy is important to firms that need to raise capital in the future, firms that require future access to capital markets are less likely to engage in earnings management.

To measure the firm's future capital-raising needs, we use four main variables: growth opportunities, leverage, venture-backed capital, and underwriter reputation. Firms with high growth opportunities have many positive NPV projects and are more likely to face a capital constraint. Thus, a value-maximizing firm with high investment opportunities is more likely to access the capital markets to accept all positive NPV projects. We follow Klapper and Love (2004)

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[7] The earnings are likely to decline in the future not only because the currently inflated earnings would return to normal, but also because to report higher earnings in a period the firm has to "borrow" these earnings from other periods.

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and use the growth in sales in the first five years after the IPO (**RevGrowth**) as a proxy for the firm's investment opportunities and expect firms with higher investment opportunities to have lower abnormal accruals.

Firms with higher leverage face a higher risk of financial distress and are more likely to require funds in the future. We use total debt ratio (**Leverage**) as a measure of leverage and expect a negative relationship between leverage and abnormal accruals.

Venture capitalists (**VC**) are in the business of funding start-up companies for a short period and divesting of the company shortly afterward. Although there are other ways of divestiture (e.g., asset sell-off), taking the firm public is a popular path. Given that venture capitalists are likely to rely on the capital markets in the future (taking another company public), they are less likely to deceive outside investors by engaging in earnings management. Thus, we expect that firms backed by venture capital will have lower abnormal accruals before the IPO.

The reputation of underwriters is at stake if the IPO firm they advise is found to have managed its earnings. The underwriter's reputation is important in this respect, not only because reputable underwriters have more expertise in discovering such practices, but they also have more at stake if their IPO engages in earnings management. More reputable underwriters could lose their reputation and face the risk of a larger settlement compared to a less reputable underwriter. To measure the underwriter reputation (**UWRank**), we use the ranking from Jay Ritter's website[8] and expect a negative relationship between underwriter reputation and earnings management.

3.2 Opportunities for earnings management

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[8] https://site.warrington.ufl.edu/ritter/ipo-data/

Although a firm might have strong incentives to engage in earnings management, it might not have the means to do so. The greatest obstacle the firm faces is the possibility that the market might discover such practice and punish the firm either through a lower IPO price or legal action. DuCharme, Malatesta, and Sefick (2004) find that issuing firms that have higher accruals are significantly more vulnerable to subsequent litigation. IPO firms are less likely to be detected, given the uncertainty and opacity of a private firm going public for the first time. However, not all IPO firms are the same. Some firms may face a higher risk of being exposed; thus, they would be less likely to engage in earnings management. In this section, we develop several hypotheses related to the opportunities a firm has to engage in earnings management.

Firm transparency could play a significant role in reducing the degree of earnings management as investors would be more likely to stop such behavior. To proxy for a firm's transparency, we follow Premti, Garcia-Feijoo, and Madura (2017) and use firm size (**LnAssets**) (measured by the natural logarithm of total assets). They argue that larger firms receive more news coverage and therefore tend to be more transparent. Large firms may also face higher scrutiny during the IPO process and higher potential litigation costs. Therefore, they would be less likely to engage in earnings management. We expect a negative relationship between firm size and earnings management.

The environment in which a firm operates could also play a significant role in limiting a firm's ability to engage in earnings management. To measure the effect of the external environment on the degree of earnings management, we use several proxies:

A country's legal environment could be a deterrent of earnings management as the likelihood of investors pursuing and winning a case against a company engaged in earnings management increases in countries with a strong legal system. To capture a country's legal

environment, we use the country Rule of Law index from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000). We refer to this variable as Rule of Law (L) throughout the paper. As a robustness test, we also use the Rule of Law variable from Kaufmann, Kraay, and Mastruzzi (2011). We refer to this variable as Rule of Law (K) throughout the paper. Updates to this variable occur annually and captures any reforms that a country may have made to improve its legal environment. We expect that firms would be less likely to engage in earnings management in countries where they could face more severe litigation. Therefore, we expect a negative relation between the country's legal environment and the degree of earnings management.

Earnings opacity is a measure of how much transparency a country's accounting practices allow for earnings management. Countries with strong accounting standards may make it harder for IPO firms to engage in earnings management. We measure earnings opacity by the Earnings Opacity Index from Boulton et al. (2011) and expect a positive relationship between Earnings Opacity and the degree of earnings management.

4. Data and methodology

Our dataset is comprised of all the non-US IPO firms in the years 1988 to 2010[9] that are covered by Securities Data Corporation (SDC) and Compustat Global. Similar to Premti (2013), we exclude from our sample all limited partnerships, leveraged buyouts, private placements, depository institutions, closed-end funds, real estate investment trusts, and unit investment trusts.

Ejara and Ghosh (2004) highlight important differences between IPO firms and firms that engage in an ADR IPO. These firms may act differently from the other IPO firms, as they may not

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[9] Prior to 1988, the data needed to calculate DCA are not available in Compustat Global. We stop the dataset in 2010 because we need five years of sales data in the post-IPO period in order to calculate sales growth.

have many growth opportunities and may not be backed by a VC. To ensure that our results are not driven by the inclusion of ADR IPOs we remove these firms from our sample.[10]

We follow the methodology of Teoh et al. (1998a) and calculate the DCA_{-1} and DCA_0 for all the firms in our sample. As a robustness test, we also calculate DCA_{-1} and DCA_0 following the methodology of Ball and Shivakumar (2008)[11]. While the focus of our study remains on DCA_{-1}, including the DCA_0 allows for further commentary on the discussion of the different pre-IPO earnings management proxies. To easily distinguish between these two measures, for the remaining of the paper we use DCA_{-1} (T) and DCA_0 (T) to refer to the Teoh et al. (1998a) measures, and DCA_{-1} (B) and DCA_0 (B) to refer to the Ball and Shivakumar (2008) measures.

To test these hypotheses, we employ the following multivariate regression model:

$DCA_i = \alpha + \beta_1 RevGrowth_i + \beta_2 Leverage_i + \beta_3 VC_i + \beta_4 UWRank_i + \beta_5 LnAssets_i + \beta_6 RuleofLaw + \beta_7 EarningsOpacity + Controls + \varepsilon_I$ (Eq. 1)

In addition to the variables related to our hypotheses, we also control for the following variables which could affect the degree of earnings management:

ROA: the return on assets in the IPO year measures the firm's profitability.

Herfindahl: the Herfindahl-Hirschman Index as a measure of industry concentration. This is measured by revenue.

<Table 1>

Table 1 further describes the source and the method of how each variable was constructed.

<Table 2>

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[10] Excluding ADR IPOs from the sample results in a sample reduction of 165 IPOs from the sample. Results of the tests presented in the paper are also ran including these firms in the sample. Results are available upon request.
[11] Appendix 1 explains in detail how DCA_{-1} and DCA_0 are calculated following these methodologies.

Table 2 displays the number of firms for which we are able to calculate DCA_{-1} and DCA_0 in each country using the Teoh et al. (1998a) and the Ball and Shivakumar (2008) method. As expected, for all countries, the number of DCA_{-1} is lower than the number of DCA_0. This is because the calculation of DCA_{-1} requires financial data for two years prior to the IPO, which is not available for many of the firms. In addition, the number of DCA (B) measures is lower in most countries. This could be because it requires data from the cash flow statement, which may contain more missing data in Compustat Global. Because of different financial disclosure requirements, prior to the IPO, across the countries contained in the sample there is variation in the number of firms for which we can calculate DCA_{-1}. For some countries, we are able to calculate DCA_{-1} for a small percentage of firms (e.g., in Malaysia or Thailand, only 20% to 40% of the DCA_0 sample can be computed for DCA_{-1}). Conversely, in countries like China, India, and Hong Kong, we are able to calculate DCA_{-1} for a high percentage of firms (75% - 100%).

5. Results

<u>\<Table 3\></u>

Table 3 displays the summary statistics of our DCA measures (left panel) and a series of statistical tests about the magnitude of the DCA measures (right two panels). DCA_{-1} (T) has a mean of 0.0072 and a median of 0.0114, while DCA_0 (T) has a mean of 0.0678 and a median of 0.0377. DCA_{-1} (B) has a mean of 0.0179 and a median of 0.0122, while DCA_0 (B) has a mean of 0.0369 and a median of 0.0287.

The middle panel of Table 3, reports the results of a series of t-tests and sign-rank tests on whether the DCA measures of IPO firms are statistically different from 0. Consistent with the earnings management hypothesis, these results show that IPO firms tend to have significantly

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positive DCA, both prior to and after the IPO. These results are consistent with the results of Teoh et al. (1998a) and show that, on average, IPO firms engage in earnings management.

The rightmost panel of Table 3 displays the results of the statistical tests on whether the use of DCA_0 magnifies the degree of pre-IPO earnings management. The results of both tests (the t-test and the rank-sum test) are significant at the 1% level and show that DCA_0 is significantly greater than DCA_{-1}. Consistent with the views of Ball and Shivakumar (2008) and Armstrong et al. (2015), these results show that DCA_0 is a biased measure of pre-IPO earnings management as it significantly magnifies the degree of pre-IPO earnings management.[12]

<Table 4>

Table 4 displays the summary statistics of the independent variables used in our regression models. RevGrowth varies considerably among the IPO firms has a mean (median) of 4.19 (0.34). Given that the leverage ratio could change significantly around the IPO, we present both the leverage ratios in the pre-IPO year and in the IPO year. It can be observed that both the mean and median leverage ratio decline significantly after the IPO (the mean declines from 0.68 to 0.37). This is expected as the firm engaging in an IPO increases its equity, thus decreasing its leverage. In unreported results, the difference in means is statistically significant at the one percent level. VC is a binary variable equaling 1 if the firm is backed by a VC, and 0 otherwise. It has a mean of 0.0583, suggesting that about 5.8% of the firms in our sample are backed by a VC. UWRank is a discrete variable with a value from 0 to 9. It has a mean of 0.30 and a median of 0, showing that most of the underwriters in our sample are of lower quality. The summary statistics for the mean and median of LnAssets show that after the IPO, the size of firms increases. In untabulated results, we find the difference in the means between the two samples to be statistically different at the 1%

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[12] These results are also consistent with the results of Premti (2013).

level. For our sample, ROA appears to have a right-skew distribution with a mean of 0.0110. The Rule of Law (L) measure ranges from 1.9 to 10, with a mean of 7.9, which suggests that most of the firms in our sample come from countries with a relatively high rule of law. The Rule of Law (K) measure ranges from -0.6395 to 2.0137, with a mean of 0.9956, which also suggests that most of the firms in our sample come from countries with a relatively high rule of law. Earnings Opacity ranges from 3.3 to 8.03, with a mean of 6.00, which suggests that the firms in our sample come from countries with a somewhat high level of earnings opacity. The Herfindahl index for the sample has a mean of 0.1644 and a median of 0.1017, indicating that most firms operate within competitive industries.

<Table 5>

Table 5 displays the correlation matrix for the variables used in our regression model. Most of the correlation coefficients are relatively low and do not raise any serious suspicion of multicollinearity; however, there is a relatively high correlation between EarnignsOpacity and the Rule of Law (K) measure, -0.8138. This coefficient raises some suspicion that multicollinearity could be an issue in our regression model.

Table 6 displays the results of our regression model. Following Petersen (2009), we run the model by clustering the standard errors by country. Models 1 and 2 use the $DCA_{-1}(T)$ measure as the dependent variable; models 3 and 4 use the $DCA_0(T)$ measure as the dependent variable; models 5 and 6 use the $DCA_{-1}(B)$ measure as the dependent variable; models 7 and 8 use the $DCA_0(B)$ measure as the dependent variable. Models 1, 3, 5, and 7 are run with Rule of Law (L) measure, while Models 2, 4, 6, and 8 are run with the Rule of Law (K) measure. The R-squares of these models range from 0.02 to 0.06.

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The coefficient of RevGrowth is negative significant in four models using the Teoh methodology. RevGrowth is statistically insignificant using the Ball and Shivakumar approach. Next, the coefficient of Leverage is always negative, and it is negative significant in four of the models. This result further supports the results of RevGrowth and suggests that leveraged firms, which may need to access the capital markets in the future to raise more funds, are less likely to manage earnings. Lastly, the coefficient of VC is negative and significant in seven of the eight models. Given that VCs are likely to need access to the capital markets for future IPOs, this result further supports the results of RevGrowth and Leverage and suggests that when the owners of the IPO firm need access to the capital markets in the future, they are less likely to manage earnings.

The coefficient of Rule of Law is negative and significant in four of the models and negative in six of the models. This result suggests that IPO firms are less likely to manage earnings if they are likely to face legal consequences for doing so.

The coefficient of ROA is negative and significant in two of the models and negative in six of the models. This result suggests that highly profitable firms are less likely to engage in earnings management.

Given the multicollinearity concerns due to the high correlation between EarnignsOpacity and Rule of Law, we checked the VIFs of our model. In all models, EarningsOpacity has the highest VIF, and it ranges between 2.61 and 3.29 in the models with Rule of Law (L) measure, and between 6.41 and 7.31 in the models Rule of Law(K) measure. Even though all VIFs are lower than 10, indicating that multicollinearity is not a serious issue, as a robustness test, similar to Flannery and James (1984) and Akhigbe and Whyte (2001), we address the multicollinearity issue by orthogonalizing Rule of Law (K) and EarningsOpacity and rerunning our models[13]. The results

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[13] Specifically, in the first stage, we run the regression model: Rule of Law = α + β EarningsOpacity + ε and store the error term as a new variable. The error term contains the portion of Rule of Law that is not explained by (is

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of these models are omitted to conserve space; however, they are consistent with the results of Table 6. In addition, the VIFs of these models show that the variable with the highest VIF continues to be EarningsOpacity; however, the highest VIF is now 2.02. Lastly, we run four additional robustness tests for our models: 1. We run our models with robust, heteroscedasticity-consistent standard errors as in White (1980). 2. We run our models by including country fixed and random effects. The results of these models are omitted to conserve space; however, they are consistent with the results of Table 6 and are available upon request. 3. We run using two weighted least squares methodologies, feasible general least squares (FGLS) and variance weighted least squares (VWLS). Again, the results of these models are omitted to conserve space; however, they are consistent with the results of Table 6 and are available upon request.

<Table 6>

5.1.   Capital market staging

The prior section analyzes the firm characteristics associated with pre-IPO earnings management. While it is important for both academics and practitioners to understand which firm characteristics are associated with pre-IPO earnings management, it is also important to understand why managers engage in pre-IPO earnings management. While managers have a clear motive to maximize their wealth, in this section, we explore another potential motive. We argue that some managers may engage in pre-IPO earnings management to avoid the financial constraint that the capital markets may impose on the IPO firms. Hertzel, Huson, and Parrino, (2012) call this phenomenon "public capital market staging" and show that, in order to minimize the overinvestment problem, the public markets may impose financial constraints on the IPO firms, similar to what is observed in the private equity capital markets. The market may underfund the

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uncorrelated with) EarningsOpacity. In the second stage, we run our regression models by replacing the Rule of Law variable with the error term from the regression above.

IPO firms, thus forcing them to return to the capital markets in the near future. Facing this constraint, the IPO firm may engage in earnings management in an effort to raise more funds, thus mitigating the need for additional capital in the near future (avoid capital market staging).

To test this hypothesis, we follow Hertzel, Huson, and Parrino (2012), and run the following probit model:

$ReturnToMarket_i = \alpha + \beta DCA + \Sigma\beta Firm\ Characteristics_i + \Sigma\beta Industry\ Characteristics_i + \Sigma\beta CountryCharateristics_i + \varepsilon_I$ (Eq. 2)

Where ReturnToMarket is a dichotomous variable, which equals one if the firm returns to the public capital markets within two years of its IPO[14] and zero otherwise.

Table 7 displays the results of the probit model. The order of the models in this table is the same as the order of the models in Table 6. The variable of interest is DCA, our measure of earnings management. The coefficient of DCA is negative and significant in all the models that include DCA_{-1} as a proxy for pre-IPO earnings management. When considering the proxy for earnings management in the IPO year, DCA_0, we still observe a negative coefficient; however, the estimate is no longer statistically significant. The negative coefficient implies that firms with a higher degree of pre-IPO earnings management are less likely to return to the capital markets within two years after their IPO. This result suggests that capital market staging may be an additional factor when considering the motivation to manage earnings in the Pre-IPO process.

<u>\<Table 7\></u>

When investigating whether managers engage in earnings management to avoid capital market staging, it is important to note that we face an endogeneity issue. Managers have a choice on whether or not they engage in earnings management. Failure to account for management choice

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[14]As a robustness test, in unreported results we also define ReturnToMarket to equal 1 if the firm returned to the capital markets within 3 years of the IPO, and the results were similar.

(the self-selection bias) in this setting may result in biased estimated coefficients. In this situation, it would make it difficult to infer the true relationship between earnings management during the IPO process and the probability of the firm to return to the capital market shortly after the IPO. Thus, controlling for endogeneity while also maintaining the country and industry controls is an important consideration for this research.

To address this endogeneity issue, we follow Lee and Masulis (2009) and Karpavičius and Suchard (2018) and run a two-stage probit model. In the first stage, we instrument DCA using the variables that are associated with DCA, but not associated with management's choice to engage in earnings management. To accomplish this, we use country legal origin as defined in La Porta et al. (1998). We select these variables because the country's legal origin would be well established prior to any business activity for the companies we consider. As a result, it is doubtful that the country's legal origin would be directly related to management's choice to engage in earnings management. However, we find that these country characteristics are correlated with DCAs as estimated in the paper. Thus, it appears that these variables are appropriate instruments. The instrumented DCA that results from this model is our main variable of interest in the second stage model. In the second stage, to test whether managers engage in earnings management to avoid capital market staging, we follow Hertzel, Huson, and Parrino, (2012) and run the probit model displayed above; however, we substitute the DCA variable with the instrumented DCA estimated from the first stage model.

Table 8 displays the results of the two-stage probit model. The bottom panel displays the results of the first stage model. We also report the chi-square for the Wald Test in all eight of our regression models. The results of the Wald Test for exogeneity show that using the instrumental variable approach is correct, as only in one of the eight models, there is a failure to reject the null

hypothesis. The results of the probit model are shown in the top panel. The coefficient of DCA is negative and significant in all eight models. This result strongly suggests that firms with the higher levels of DCA are less likely to return to the market within two years. Given the findings reported in tables 7 and 8, we conclude that avoiding capital market staging may be an additional motivation for managers in engaging in earnings management during the pre-IPO process.

<Table 8>

6. Conclusion

Given that the degree of pre-IPO earnings management could have negative consequences on investors' wealth, we explore firm characteristics that can help investors determine the degree of pre-IPO earnings management. Consistent with the earnings management hypotheses, we find that firms that are more likely to need the capital markets in the future (firms with higher leverage and firms that are backed by venture capital) are less likely to manage earnings before the IPO. IPOs in countries with a strong rule of law are less likely to engage in earnings management. This result suggests that the country's rule of law increases litigation costs for these companies.

We also investigate the public equity market staging in an international context. We find that earnings management is negatively associated with the propensity to return to the capital markets within two or three years (e.g., capital market staging). We interpret this finding as those managers who opportunistically engage in earnings management can reduce the probability of being subjected to the increased monitoring associated with capital market staging. It appears that managers who engage in pre-IPO earnings management may benefit in two ways: by enjoying higher IPO issuance prices and by avoiding the increased monitoring by going through capital market staging.

In the process, consistent with Ball and Shivakumar (2008), we find that DCA_0 is a biased proxy for a firm's pre-IPO earnings management. Our tests showed that DCA_0 is significantly greater than DCA_{-1}. However, consistent with Teoh et al. (1998a), we also find that IPO firms, on average, do engage in pre-IPO earnings management. Our tests showed that DCA_{-1} is significantly greater than 0, suggesting that IPO firms have positive accruals.

Appendix 1: Calculation of DCA_{-1} and DCA_0

DCA_{-1} and DCA_0 following the Teoh et al. (1998a) methodology:

We collect financial data on all firms covered by Compustat Global. For each firm/year, we calculate current accruals (CA) as:

CA=Δ(account receivables + inventory + other current assets) - Δ(Account payables + taxes payable + other current liabilities)

Then, the following regression model is run for each industry/country/year in order to estimate the α and β used for estimating the expected current accruals for that particular industry/country/year:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = \alpha\left(\frac{1}{TA_{j,t-1}}\right) + \beta\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t}$$

where TA is total assets.

Similar to Teoh et al. (1998a) we define each industry by its 2-digit SIC code, we exclude all IPO firms from this estimation and include in the sample only industries that have at least 10 firms in that particular country/year.

The nondiscretionary accruals (NDCA) are calculated as:

$$\text{NDCA}_{i,t} = \hat{\alpha}\left(\frac{1}{TA_{i,t-1}}\right) + \hat{\beta}\left(\frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}}\right)$$

where ΔTR is the change in trade receivables.

Lastly, we calculate DCA as:

$$\text{DCA}_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t}$$

DCA$_{-1}$ and DCA$_0$ following the Ball and Shivakumar (2008) methodology:

We collect financial data on all firms covered by Compustat Global. For each firm/year, we calculate accruals (ACC) as:

ACC = (Earnings-Cash Flow from Operations)/ Total Assets

where Earnings and Cash Flow from Operations are taken from the cash flow statement. Then, the following regression model is run for each industry/country/year in order to estimate the regression coefficients for estimating the normal accruals:

$ACC_{i,t} = \alpha + \beta_1 \Delta Sales_{i,t} + \beta_2 FASSET_{i,t} + \beta_3 CFO_{i,t} + \beta_4 DCFO_{i,t} + \beta_5 DCFO*CFO_{i,t} + \varepsilon_{i,t}$

where ΔSales is the change in sales; FASSET is the book value of fixed assets; CFO is the cash flow from operations, and DCFO is an indicator variable that takes the value of 1 if the CFO is negative, and 0 otherwise. Similar to Ball and Shivakumar (2008) we define each industry by its 2-digit SIC code, we exclude all IPO firms from this estimation and include in the sample only industries that have at least 10 firms in that particular country/year.

Lastly, the DCA is calculated as the firm's acctual ACC minus the normal ACC:

$DCA_{j,t} = ACC_{j,t} - \widehat{ACC}_{j,t}$

$= ACC_{j,t} - [\hat{\alpha} + \hat{\beta}_1 \Delta Sales_{j,t} + \hat{\beta}_2 FASSET_{j,t} + \hat{\beta}_3 CFO_{j,t} + \hat{\beta}_4 DCFO_{j,t} + \hat{\beta}_5 DCFO*CFO_{j,t}]$

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Table 1: Description of the Variables Used in our Model

Variable	Proxy for:	Definition	Source
RevGrowth	Growth opportunities	The growth in sales in the first five years after the IPO	Compustat Global
Leverage	Future needs for capital markets	Total debt ratio	Compustat Global
VC	Future needs for capital markets	A dummy variable that equals 1 if the IPO firm was backed by a venture capitalist.	SDC
UWRank	Future needs for capital markets	Underwriter's reputation	Jay Ritter's page
LnAssets	Firms transparency	The natural logarithm of total assets	Compustat Global
RuleofLaw	Country's legal environment	The Rule of Law Index	La Porta et al. (2000) Kaufmann et al. (2011)
Earnings Opacity	Country's accounting practices	The Earnings Opacity Index	Boulton et al. (2011)
ROA	Control	Return on Assets	Compustat Global
Herfindahl	Control	Computed by Sales Data (Sum of squared firm proportions within an industry)	Curry and George (1983), Nawrocki and Carter (2010): Compustat Global

Table 1 describes the calculation and source of the variables used in our regression models.

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Table 2: Sample Description

Nation	N DCA$_{-1}$ (Teoh)	N DCA$_0$ (Teoh)	N DCA$_{-1}$ (Ball)	N DCA$_0$ (Ball)
Australia	152	424	98	281
Bermuda	1	1	1	1
Brazil	7	8	7	6
China	660	749	382	590
Denmark	2	4	2	3
Finland	1	1	1	1
France	80	152	59	99
Germany	58	130	40	105
Hong Kong	9	12	11	11
India	177	197	142	173
Indonesia	0	1	0	0
Ireland-Rep	2	3	0	1
Isle of Man	0	1	0	0
Italy	9	25	7	13
Japan	400	680	367	455
Jersey	4	4	3	3
Malaysia	20	103	45	113
Netherlands	1	2	0	1
New Zealand	2	5	3	3
Norway	4	7	3	5
Russian Fed	1	2	1	2
Singapore	33	67	23	48
South Africa	3	3	0	0
Spain	0	1	0	0
Sweden	11	21	9	15
Switzerland	1	1	1	1
Taiwan	177	273	176	273
Thailand	4	14	3	10
United Kingdom	200	402	41	98
Total	2019	3293	1425	2311

Table2: Table 2 displays the number of IPO firms by country. The first two columns display the results for the DCA measures calculated using the Teoh et al. (1998) method, while columns 3 and 4 display the results for the DCA measures calculated using the Ball and Shivakumar (2008) method.

Table 3. Summary Statistics: DCA

							Statistical Tests			
							DCA>0		$DCA_0 > DCA_{-1}$	
	Summary Statistics						t-test	Sign-Rank test	t-test	Rank-Sum test
	Mean	Median	Std. Dev.	Min	Max	N	t-stat	Z-stat	t-stat	Z-stat
DCA_{-1} (Teoh)	0.0072	0.0114	0.2244	-0.5952	0.4864	2,019	1.4366	3.439***	8.3945***	7.499***
DCA_0 (Teoh)	0.0678	0.0377	0.2833	-0.5502	0.7631	3,293	13.7235***	14.874***		
DCA_{-1} (Ball)	0.0179	0.0122	0.1010	-0.3174	0.3698	1,425	6.7053***	8.056***	3.0894***	6.719***
DCA_0 (Ball)	0.0369	0.0287	0.1736	-0.5899	0.6465	2,311	10.2333***	17.582***		

Table 3 displays the summary statistics for the study's main variables of interest, discretionary current accruals (DCA) as estimated using two different methodologies: Teoh et al. (1998) and Ball and Shivakumar (2008). We report the statistics for both DCA_{-1}, the pre-IPO year as well as DCA_0, the year of the IPO. The middle panel reports the results of a series of t-tests and sign-rank tests on whether the DCA measures of IPO firms are statistically different from 0. The right panel displays the results of the statistical tests on whether DCA_0 is significantly different from DCA_{-1}. ***, **, * denote significance at the 1%, 5% and 10% levels of statistical significance respectively.

Table 4. Summary Statistics: Independent Variables

	Mean	Median	Std. Dev.	Min	Max	N
RevGrowth	4.1904	0.3422	97.4820	-1.9070	5704.3330	4,637
$Leverage_{-1}$	0.6831	0.5845	1.7222	0	71	3443
$Leverage_0$	0.3690	0.3628	0.2433	0	5.7732	4935
VC	0.0583	0	0.2343	0	1	10633
UWRank	0.3012	0	1.5237	0	9	10633
LnAssets-1	3.2090	3.4685	1.9790	-6.0293	14.9429	3,465
LnAssets0	3.8063	3.8666	1.6131	-3.9818	14.3409	4915
Rule of Law (La Porta)	7.9175	8.5667	1.9148	1.9	10	9380
Rule of Law (Kaufmann)	0.9956	1.3478	0.8204	-0.6395	2.0137	4984
Earnings Opacity	6.0039	6.2700	1.2782	3.3000	8.0300	6719
ROA	0.0110	0.0645	0.4248	-14.6701	1.5270	4,968
Herfindahl	0.1644163	0.1017155	0.1547028	0.0118105	0.9994626	4823

Table 4 displays summary statistics for the independent variables considered in the regression equations of the paper.

Table 5. Correlation Matrix

	DCA$_{-1}$ (Teoh)	DCA$_0$ (Teoh)	DCA$_{-1}$ (Ball)	DCA$_0$ (Ball)	RevGrowth	Leverage$_{-1}$	VC	UWRank	LnAssets-1	ROA	Rule of Law (La Porta)	Rule of Law (Kaufmann)	Earnings Opacity	Herfindahl
DCA$_{-1}$ (Teoh)	1													
DCA$_0$ (Teoh)	-0.0595	1												
DCA$_{-1}$ (Ball)	0.261	-0.0458	1											
DCA$_0$ (Ball)	0.261	-0.0458	1	1										
RevGrowth	-0.0159	0.0221	0.0529	0.0529	1									
Leverage$_{-1}$	-0.0618	0.145	-0.1381	-0.1381	-0.0166	1								
VC	-0.0476	-0.0414	-0.0736	-0.0736	-0.0344	-0.0135	1							
UWRank	-0.0776	-0.0098	-0.0447	-0.0447	-0.027	0.0148	0.119	1						
LnAssets-1	0.04	-0.0377	-0.0621	-0.0621	-0.1415	0.0351	0.1198	0.1321	1					
ROA	0.0035	-0.0528	0.1549	0.1549	-0.0335	-0.6269	-0.0157	0.0167	0.1676	1				
Rule of Law (La Porta)	-0.2485	-0.0802	-0.083	-0.083	-0.0405	0.0096	0.0616	0.1321	-0.1084	-0.1192	1			
Rule of Law (Kaufmann)	-0.2535	-0.0823	-0.0578	-0.0578	0.0096	0.0605	0.0713	0.1294	-0.1667	-0.1677	0.8935	1		
Earnings Opacity	0.2144	0.0233	0.0107	0.0107	-0.0684	-0.083	0.0332	-0.0105	0.2893	0.2454	-0.7183	-0.8138	1	
Herfindahl	-0.0885	-0.0088	-0.0372	-0.0372	0.0801	0.0373	0.0019	-0.0252	-0.2117	-0.1115	0.2761	0.3455	-0.5339	1

Table 5 displays the full correlation matrix for all independent and dependent variables used throughout the paper.

Table 6. Firm characteristics and their relationship to Pre-IPO Earnings Management Proxy (DCA_0 or DCA_{-1})

	Model 1 DCA_{-1} (Teoh)	Model 2 DCA_{-1} (Teoh)	Model 3 DCA_0 (Teoh)	Model 4 DCA_0 (Teoh)	Model 5 DCA_{-1} (Ball)	Model 6 DCA_{-1} (Ball)	Model 7 DCA_0 (Ball)	Model 8 DCA_0 (Ball)
Constant	0.0782	-0.228	0.338***	0.222***	0.228***	0.0927	0.198*	0.139*
	(0.85)	(-1.54)	(3.49)	(3.39)	(3.31)	(1.35)	(1.93)	(1.98)
RevGrowth	-0.0000860***	-0.0000785***	-0.000138***	-0.000137***	0.000683	0.000842	-0.0000788	-0.0000834
	(-6.72)	(-6.08)	(-4.70)	(-4.52)	(1.03)	(1.46)	(-1.12)	(-1.18)
Leverage	-0.016	-0.0169*	-0.110***	-0.0865**	-0.00831	-0.00766	-0.0427*	-0.022
	(-1.63)	(-1.79)	(-3.51)	(-2.76)	(-0.68)	(-0.64)	(-1.93)	(-0.84)
VC	-0.0209*	-0.0179	-0.0442***	-0.0369***	-0.0120***	-0.0147***	-0.0180**	-0.0247**
	(-1.93)	(-1.67)	(-3.39)	(-3.80)	(-3.16)	(-3.12)	(-2.46)	(-2.58)
UWRank	-0.00824**	-0.0101**	0.00174	0.00165	-0.00062	-0.00157	0.0044	0.00402*
	(-2.24)	(-2.46)	(0.58)	(0.56)	(-0.59)	(-1.64)	(1.72)	(1.84)
LnAssets	0.00691	-0.000828	0.00996	0.00238	-0.00552*	-0.00585*	-0.00185	-0.00241
	(1.07)	(-0.11)	(0.95)	(0.21)	(-1.90)	(-2.06)	(-0.39)	(-0.53)
ROA	-0.0269***	-0.0231**	-0.00877	-0.00921	0.0438	0.0482	-0.00367	-0.00363
	(-3.36)	(-2.73)	(-0.56)	(-0.59)	(1.34)	(1.54)	(-0.98)	(-0.92)
Rule of Law	-0.0214***	0.0313	-0.0267***	-0.0474***	-0.00893***	-0.00147	-0.00199	0.0098
	(-3.75)	(0.90)	(-3.36)	(-2.96)	(-3.39)	(-0.10)	(-0.44)	(0.94)
Earnings Opacity	0.0145	0.0354	-0.00782	-0.0122	-0.0167**	-0.00636	-0.0149	-0.0114
	(1.30)	(1.56)	(-0.61)	(-1.04)	(-2.19)	(-0.66)	(-1.34)	(-1.21)
Herfindahl	0.0795	0.0202	0.00278	-0.0711	-0.0758	-0.0565	-0.193**	-0.152**
	(0.99)	(0.26)	(0.03)	(-0.73)	(-1.57)	(-1.49)	(-2.77)	(-2.11)
N	1129	1729	2119	2777	876	1251	1373	1873
R-sq	0.06	0.02	0.03	0.03	0.06	0.05	0.02	0.02

Table 6 displays the results of our regression model. Models 1 and 2 use the DCA_{-1}(T) measure as the dependent variable; models 3 and 4 use the DCA_0(T) measure as the dependent variable; models 5 and 6 use the DCA_{-1}(B) measure as the dependent variable; models 7 and 8 use the DCA_0(B) measure as the dependent variable. Models 1, 3, 5, and 7 are run with Rule of Law(L) measure, while Models 2, 4, 6, and 8 are run with the Rule of Law(K) measure. We cluster standard errors at the country level. ***, **, * denote significance at the 1%, 5% and 10% levels of statistical significance respectively.

Table 7. Earnings management and capital market staging

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	DCA_{-1} (Teoh)	DCA_{-1} (Teoh)	DCA_0 (Teoh)	DCA_0 (Teoh)	DCA_{-1} (Ball)	DCA_{-1} (Ball)	DCA_0 (Ball)	DCA_0 (Ball)
	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years	Dependant Issue 2 Years
Constant	0.456	-0.786	-0.240	-0.662	-0.574	-1.007	-0.718	-0.681
	(0.481)	(0.199)	(0.744)	(0.291)	(0.587)	(0.246)	(0.500)	(0.423)
DCA	-0.002*	-0.005*	-0.072*	-0.064**	-0.576***	-0.488*	-0.001*	-0.195*
	(-1.971)	(-1.934)	(-1.929)	(-2.061)	(-2.606)	(-2.408)	(-1.879)	(-1.885)
RevGrowth	0.005**	0.006*	0.000	0.000	0.020*	0.022**	0.003*	0.003*
	(2.004)	(1.936)	(0.949)	(0.978)	(1.936)	(2.131)	(1.865)	(1.928)
Leverage	0.143	0.287	0.283	0.314*	0.183	0.374	0.272	0.411*
	(0.871)	(1.439)	(1.478)	(1.734)	(0.758)	(1.418)	(1.175)	(1.650)
VC	-0.027	-0.002	0.063	0.077	0.114	0.134	0.171	0.191**
	(-0.265)	(-0.014)	(0.671)	(0.879)	(1.057)	(1.394)	(1.589)	(2.036)
UWRank	-0.044***	-0.049***	-0.026*	-0.032**	-0.058***	-0.062***	-0.053***	-0.056***
	(-5.102)	(-6.363)	(-1.742)	(-2.530)	(-7.549)	(-6.994)	(-7.101)	(-5.667)
LnAssets	0.081	0.084	-0.022	-0.016	0.090	0.096*	-0.011	-0.010
	(1.398)	(1.604)	(-0.451)	(-0.345)	(1.454)	(1.717)	(-0.167)	(-0.169)
Rule of Law	-0.013	0.345***	0.060	0.386***	0.0348	0.304**	0.068	0.303**
	(-0.359)	(3.166)	(0.936)	(3.433)	(0.667)	(2.078)	(1.037)	(2.213)
Earnings Opacity	-0.260***	-0.167**	-0.187**	-0.124*	-0.166	-0.136	-0.141	-0.130
	(-4.337)	(-2.843)	(-3.101)	(-1.855)	(-1.529)	(-1.425)	(-1.401)	(-1.424)
ROA	-0.094	-0.095	-0.078	-0.075	-0.279***	-0.277***	-0.056	-0.054
	(-1.246)	(-1.271)	(-1.827)	(-1.885)	(-3.066)	(-3.207)	(-0.832)	(-0.866)
Herfindahl	1.162**	1.508**	1.038**	1.189***	0.955*	1.266*	1.445***	1.562***
	(2.966)	(2.916)	(3.173)	(3.624)	(2.003)	(2.381)	(3.562)	(4.173)
N	1133	1733	2119	2777	884	1264	1397	1911
R-sq	0.063	0.157	0.063	0.133	0.057	0.118	0.071	0.135
Rule of Law Specification	La Porta et al. (2000)	Kaufmann et al. (2011)	La Porta et al. (2000)	Kaufmann et al. (2011)	La Porta et al. (2000)	Kaufmann et al. (2011)	La Porta et al. (2000)	Kaufmann et al. (2011)

Table 7 displays the results of the probit model, which measures the firm's propensity to return to the capital markets following an IPO. DCA in the pre-IPO years (following the Ball estimates of DCA) is our variable of interest in predicting the probability of a firm to return to the public markets within two years. The dependent variable is a binary variable, where a value of one is assigned if the firm returned to the public markets within two years, and zero otherwise. Standard errors are clustered at the country level. ***, **, * denote significance at the 1%, 5% and 10% levels of statistical significance respectively.

Table 8. Earnings management and capital market staging using instrumented variables.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Return to market with IV for DCA-1 (Teoh)	Return to market with IV for DCA-1 (Teoh)	Return to market with IV for DCA0 (Teoh)	Return to market with IV for DCA0 (Teoh)	Return to market with IV for DCA-1 (Ball)	Return to market with IV for DCA-1 (Ball)	Return to market with IV for DCA0 (Ball)	Return to market with IV for DCA0 (Ball)
Constant	-0.221	-0.084	1.137***	0.965***	-2.259***	-1.093	-1.379**	-1.198**
	(-0.444)	(-0.113)	(3.147)	(3.009)	(-2.896)	(-1.502)	(-2.124)	(-2.257)
DCA	-4.472***	-3.803***	-3.536***	-3.536***	-9.573***	-5.644**	-6.980***	-6.650***
	(-7.617)	(-3.517)	(-6.149)	(-6.383)	(-4.878)	(-2.191)	(-3.855)	(-4.163)
RevGrowth	0.001	0.003	-0.0005***	-0.0005***	0.0008	0.0121	0.0011**	0.0014**
	(0.552)	(1.063)	(-4.224)	(-4.079)	(0.093)	(0.731)	(1.970)	(2.114)
Leverage	-0.530***	-0.350	-0.337***	-0.342***	0.752***	0.640	0.332*	0.375*
	(-3.866)	(-1.301)	(-4.669)	(-3.406)	(4.223)	(1.608)	(1.811)	(1.826)
VC	0.071	0.057	-0.145***	-0.150***	0.141**	0.180**	0.163***	0.188***
	(1.453)	(1.012)	(-4.434)	(-3.692)	(2.516)	(2.098)	(3.575)	(3.645)
UWRank	0.036**	0.012	0.002	0.003	-0.012	-0.039*	-0.043***	-0.046***
	(2.319)	(0.343)	(0.146)	(0.184)	(-0.804)	(-1.684)	(-2.594)	(-2.770)
LnAssets	0.006	0.041	0.031	0.023	0.039	0.076	0.006	0.001
	(0.151)	(0.667)	(0.974)	(0.711)	(0.870)	(0.977)	(0.154)	(0.033)
Rule of Law	0.100***	0.289	0.084***	0.269**	0.088**	0.133	0.028	0.073
	(2.648)	(1.506)	(3.061)	(2.384)	(2.239)	(0.828)	(0.941)	(0.783)
Earnings Opacity	-0.076	-0.125	-0.058	-0.078	0.097	-0.077	0.056	0.031
	(0.324)	(0.286)	(0.166)	(0.214)	(0.212)	(0.511)	(0.304)	(0.501)
ROA	0.0853	0.0197	-0.0443	-0.0462	-0.547*	-0.519*	0.00968	-0.00128
	(1.527)	(0.195)	(-0.672)	(-0.701)	(-2.180)	(-2.344)	(0.536)	(-0.050)
Herfindahl	-0.436	0.475	0.193	0.0142	1.014**	1.208***	1.613***	1.765***
	(-0.848)	(0.629)	(0.547)	(0.028)	(2.204)	(2.647)	(3.246)	(3.482)

	IV Model 1	IVModel 2	IV Model 5	IVModel 6	IV Model 3	IVModel 4	IV Model 7	IVModel
	DCA-1 (Teoh)	DCA-1 (Teoh)	DCA0 (Teoh)	DCA0 (Teoh)	DCA-1 (Ball)	DCA-1 (Ball)	DCA0 (Ball)	DCA0 (Ball)
Constant	0.003	-0.154	0.509***	0.315***	0.136**	0.0648	0.0540	0.121**
	(0.015)	(-0.782)	(3.243)	(3.942)	(2.355)	(1.159)	(0.624)	(2.413)
RevGrowth	-0.0001***	-0.0001***	-0.0001***	-0.0001***	0.0005	0.0004	-0.0001*	-0.0001*
	(-5.430)	(-5.260)	(-4.632)	(-4.692)	(0.707)	(0.635)	(-1.055)	(-1.067)
Leverage	-0.121***	-0.114***	-0.110***	-0.108***	-0.071***	-0.073***	-0.038**	-0.039**
	(0.001)	(0.002)	(-3.360)	(-3.206)	(-4.057)	(-4.183)	(-2.343)	(-2.249)
VC	-0.0157	-0.0149	-0.0464***	-0.0461***	-0.0106***	-0.0117**	-0.0164***	-0.0177***
	(-1.497)	(-1.418)	(-3.518)	(-3.607)	(-3.324)	(-3.285)	(-3.350)	(-3.363)
UWRank	-0.00879*	-0.00897*	0.00189	0.00203	-0.000522	-0.000843	0.00403	0.00378
	(-2.376)	(-2.321)	(0.640)	(0.657)	(0.607)	(0.340)	(1.620)	(1.659)
LnAssets	0.000172	0.00214	0.00763	0.00644	-0.00102	-0.000219	0.000382	0.000458
	(0.980)	(0.739)	(0.708)	(0.597)	(-0.389)	(-0.086)	(0.927)	(0.913)
Rule of Law	-0.0197	-0.0375	-0.0360***	-0.0906***	-0.004	0.00161	0.00489	0.00643

(-1.444)	(-0.828)	(-3.736)	(-4.266)	(-1.312)	(0.137)	(1.376)	(0.577)
Earnings Opacity 0.0174	0.0222	-0.0201	-0.0193	-0.00864	-0.00311	-0.00427	-0.00895
(0.356)	(0.304)	(-1.306)	(-1.462)	(-1.463)	(-0.443)	(-0.520)	(-1.292)
ROA -0.0202*	-0.0172	0.00359	-0.0449	0.0496**	0.0506**	-0.00294	-0.00254
(-2.170)	(-1.723)	(0.043)	(-0.497)	(1.974)	(2.073)	(-1.027)	(-0.905)
Herfindahl 0.114	0.0513	-0.0306	-0.00761	-0.0775	-0.0606	-0.186***	-0.180***
(1.123)	(0.446)	(-1.160)	(-0.812)	(-1.822)	(-1.554)	(-3.603)	(-3.941)
British Common Law 0.00917	0.0457	0.0151	0.0174	0.0143**	0.0233**	0.0207**	0.0104
(0.264)	(1.203)	(0.869)	(0.342)	(2.420)	(2.283)	(2.705)	(1.023)
French Civil Law -0.00225	-0.00807	-0.000370	0.0118	-0.005	-0.008	-0.00865	-0.0211**
(-0.272)	(-0.371)	(-0.026)	(0.345)	(-0.683)	(-0.678)	(-1.237)	(-2.618)
Scandinavian Civil Law 0.00552	0.0468	-0.000370	0.0118	-0.002	-0.029	0.00478	-0.00688
(0.234)	(0.571)	(0.979)	(0.730)	(-0.204)	(-1.637)	(0.602)	(-0.520)
N 1131	1142	2117	2136	883	895	1396	1409
Chi Sq. 319.33	658.93	344.50	303.82	1163.73	577.99	670.88	756.34
Wald Test Chi Sq. 4.82**	5.81**	9.27***	3.22*	5.95**	2.79	29.35***	12.84***
Rule of Law Specification *La Porta et al. (2000)*	*Kaufmann et al. (2011)*	*La Porta et al. (2000)*	*Kaufmann et al. (2011)*	*La Porta et al. (2000)*	*Kaufmann et al. (2011)*	*La Porta et al. (2000)*	*Kaufmann et al. (2011)*

Table 8 displays the results of the probit model, which measures the firm's propensity to return to the capital markets following an IPO. The first stage estimates are displayed as the third (model one) and fourth (model two) for reference. The results of the second stage where the instrumented DCA value is used as the independent variable are shown in the first two presented models. The instrumented DCA is our variable of interest in predicting the probability of a firm to return to the public markets within two years. The dependent variable is a binary variable, where a value of one is assigned if the firm returned to the public markets within two years, and zero otherwise. Standard errors are clustered at the country level. ***, **, * denote significance at the 1%, 5% and 10% levels of statistical significance respectively.