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Abnormal Accruals in Newly Public Companies: Opportunistic Misreporting or Economic Activity?

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Newly public companies tend to exhibit abnormally high accruals in the year of their initial public offering (IPO). Although the prevailing view in the literature is that these accruals are caused by opportunistic misreporting, we show that these accruals do not appear to benefit managers and instead result from the normal economic activity of newly public companies. In particular, and in contrast to the notion that managers benefit from inflating accruals through an inflated issue price, inflated post-IPO equity values, and increased insider trading profits, we find no evidence of a relation between abnormal accruals and these outcomes. Instead, consistent with these accruals resulting from normal economic activity, we find that these accruals are attributable to the investment of IPO proceeds in working capital and that controlling for the amount of IPO proceeds invested in working capital produces a more powerful accrual-based measure of misreporting.

Keywords: misreporting; earnings management; financial reporting quality; accruals; incentives; insider trading; initial public offering; new issues puzzle; investment
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1. Introduction

There is a widespread belief in the accounting and finance literature that earnings are systematically inflated at the time of a company's initial public offering (IPO). This belief is fueled by the notion that earnings management requires opportunity and incentive, both of which are thought to be heightened at the time of the IPO. The *opportunity* is thought to exist because of the relatively high degree of information asymmetry between managers and new investors in the company's securities. The *incentive* for earnings management is also thought to be heightened for at least two reasons that are unique to the IPO. First, managers typically have a large portion of their wealth tied to the value of their firm's equity, and the IPO provides managers the ability to diversify their concentrated holdings in the firm. Second, once the company is publicly traded, managers will be evaluated on the basis of the company's stock price.

In light of the unique opportunities and purported incentives for earnings management, many studies examine the financial reporting quality of newly public companies. A well-documented empirical regularity in the accounting and finance literature is that newly public companies tend to exhibit abnormally high accruals in the year of their IPO.[1] With rare exception, prior studies conclude that these abnormally high accruals are the result of *systematic*, opportunistic misreporting.[2] One limitation of these studies, however, is that the evidence of opportunistic misreporting is based *exclusively* on the magnitude of abnormal accruals.

Relying exclusively on the magnitude of abnormal accruals is an important limitation. In particular, the abnormal accruals of newly public firms could be elevated because of either managerial opportunism (i.e., intentional manipulation) or other, more benign reasons (e.g., economic activity that is unique to newly

[1] Throughout the paper, we use the term "in the year of the IPO" or "IPO-year" to refer to the fiscal year that contains the IPO.

[2] See Dechow et al. (2010) for a review of the literature on this point. Examples include Teoh et al. (1998a, b), Bradshaw et al. (2001), DuCharme et al. (2001, 2004), Katz (2009), Morsfield and Tan (2006), Lo (2008), and Wongsunwai (2013). Exceptions include Ball and Shivakumar (2008) and Cecchini et al. (2012). We use the term "systematic" because prior studies conclude that the *average* firm misreports at the IPO. See Beneish (1998) for additional discussion on this point.

public companies).[3] Abnormal accruals are commonly calculated as the difference between the level of accruals in newly public companies and the normal or "expected" level of accruals estimated from a broad sample of publicly traded companies. This presents a classic identification problem: abnormal accruals reflect both differences in misreporting and differences in economic activity (that give rise to nonmanipulated accruals) between newly public companies and their more mature counterparts. We refer to these two explanations for abnormal accruals as the *misreporting explanation* and the *economic activity explanation*, respectively. It is important to note that these two explanations are not mutually exclusive. It is possible that abnormally high accruals are the result of *both* misreporting and economic activity. In this paper, we take the large abnormal accruals in the year of the IPO as given and develop two sets of tests to discriminate between these explanations.

We calculate abnormal accruals in the year of the IPO using three models of expected accruals. The first two models are common in the literature: the modified cross-sectional Jones (1991) model and the performance-matched model of Kothari et al. (2005). In addition, we introduce a novel method of calculating abnormal accruals, the size-age-growth–matched model. This model extends the performance-matched model of Kothari et al. (2005) by matching on firm size, firm age, and firm growth. The interpretation of abnormal accruals varies depending on the model used to calculate expected accruals. In the latter two matching models, the level of abnormal accruals is inherently measured relative to publicly traded firms with similar characteristics.

In our first set of tests, we examine the misreporting explanation. If, as the prior literature argues, opportunistic misreporting is pervasive in newly public companies, then we expect to find that managers' incentives for (or net benefits from) misreporting are similarly pervasive. We adopt the agency-theoretic notion of incentives from the broader incentive-contracting literature (e.g., Core et al. 2003) and define a manager's incentives to take a particular action (e.g., inflate accruals) as the partial derivative of the manager's expected utility with respect to that action. Since a particular action can affect multiple outcomes that each, in turn, affects a manager's expected utility, we consider several outcomes that are commonly thought to provide managers of newly public companies with incentives to misreport. Specifically, we examine whether managers benefit from inflating accruals through (i) a higher IPO issue price, (ii) higher post-IPO equity values, and (iii) greater insider trading profits.

We find no evidence of a relation between abnormal accruals and any of these outcomes. Notably, we find that firms with high IPO-year abnormal accruals earn negative abnormal returns not because they have high accruals but because they have low cash flows. After controlling for cash flows, we find that abnormal accruals *do not* predict post-IPO returns. This finding casts doubt on the notion that managers have incentives to inflate accruals to boost post-IPO equity values. Consistent with this finding, and in contrast to the belief that managers have incentives to inflate accruals in order to sell their shares at an inflated price (i.e., "pump and dump"), we also find no relation between IPO-year abnormal accruals and several measures of insider trading activity and profitability.

In our second set of tests, we examine the economic activity explanation. Specifically, we examine whether IPO-year abnormal accruals are the result of the tendency of newly public companies to invest IPO proceeds in working capital.[4] Since accruals by definition include changes in working capital, any investments in working capital in the same year as the IPO will mechanically increase IPO-year accruals. Consequently, the tendency to invest IPO proceeds in working capital in the same fiscal year as the IPO may mechanically produce large abnormal accruals even absent misreporting. If IPO-year abnormal accruals are the result of newly public companies investing IPO proceeds in working capital, then we expect (i) a positive relation between IPO proceeds and accruals; (ii) that both the level of IPO-year accruals and their correlation with IPO proceeds are larger when the IPO occurs early in the fiscal year, when IPO-year financials are more likely to reflect *post*-IPO investments; (iii) that elevated accruals are driven by an increase in specific working capital accounts (e.g., reduction in payables); and (iv) that controlling for the IPO proceeds invested in working capital produces a more powerful accrual-based measure of misreporting.

Evidence from our second set of tests consistently suggests that large IPO-year accruals are the result of newly public companies investing IPO proceeds in working capital. We find a positive relation between IPO proceeds and IPO-year accruals and no evidence of abnormal accruals after controlling for proceeds.

[3] See Guay et al. (1996) for a discussion of alternative interpretations of abnormal accruals.

[4] Throughout the paper, we use the term "working capital" to refer to noncash working capital. Although inflating working capital is one of the more common ways to manage earnings (see Dechow and Schrand 2004), an increase in working capital can also come from investment in current assets (e.g., inventory and net accounts receivable) and reductions in current liabilities (e.g., accounts payable).

Although a relation between IPO proceeds and IPO-year accruals in and of itself is consistent with both the misreporting and economic activity explanations, we find that the relation is larger when the IPO-year financial statements reflect primarily *post*-IPO activity (i.e., when the IPO occurs early in the fiscal year). Notably, we find that IPO-year accruals are abnormally large (both statistically and economically) *only* when the IPO occurs early in the fiscal year. This finding is consistent with the IPO proceeds influencing accruals, but not vice versa.

Additionally, we find that the abnormally large accruals of firms with IPOs early in their fiscal year are entirely attributable to larger working capital accruals. Specifically, whereas all IPO firms tend to experience an increase in their payables (receivables), we find that firms with IPOs early in their fiscal year experience less of an increase in payables (a greater increase in receivables) than their counterparts with IPOs late in their fiscal year. We argue that smaller changes in accounts payable is consistent with IPO proceeds being used to pay rather than defer (i.e., accrue) expenses, and that because the IPO occurs so early in the fiscal year, the large increase in the receivables of these firms reflects increased sales to customers as a result of increased awareness of the firm stemming from the IPO than earnings management.

Finally, we find no evidence of a relation between IPO-year accruals and the incidence of accounting fraud in IPO firms (measured using U.S. Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Releases (AAERs)). This result stands in contrast to the prior literature that finds a positive relation between accruals and accounting fraud in the broader sample of all publicly traded companies (e.g., Richardson et al. 2006, Dechow et al. 2012). Importantly, however, we find that controlling for the amount of IPO proceeds invested in working capital produces a more powerful accrual-based measure of misreporting. The portion of accruals that *is* attributable to investment of IPO proceeds is *unrelated* to the incidence of accounting fraud, but the portion of accruals that *is not* attributable to investment of IPO proceeds is *positively* related to the incidence of accounting fraud. The differential relation between these two components of accruals and accounting fraud suggests that accruals generated by the investment of IPO proceeds in working capital are the result of the normal economic activity.

Collectively, the findings from our first set of tests suggest that large abnormal accruals in newly public companies are not the result of *systematic* opportunism, and the findings from our second set of tests suggest that such accruals are instead attributable to the investment of IPO proceeds in working capital. Taken together, our findings suggests that economic differences between newly public companies and mature publicly traded companies imparts an upward bias in commonly used estimates of abnormal accruals and that the financial reporting quality of newly public companies is considerably higher than is widely alleged. Although some newly public firms undoubtedly misreport, the incidence of misreporting is no different than that of the broader sample of publicly traded firms.

The remainder of this study is organized as follows. Section 2 discusses the relevant prior literature. Section 3 discusses our research design. Section 4 describes our sample and the measurement of our primary variables. Section 5 discusses our results. Section 6 concludes.

2. Related Literature and Hypothesis Development

2.1. Institutional Aspects of Financial Reporting in Newly Public Companies

Newly public companies face increased litigation risk and heightened scrutiny relative to their more mature, publicly traded counterparts (e.g., Lowry and Shu 2002, DuCharme et al. 2004, Billings and Lewis 2016). The increase in litigation risk is largely due to securities laws that both shift the burden of proof and increase the maximum legal liability for misreporting in connection with an IPO. In particular, although false or misleading statements are generally covered under Section 10b of the Securities Act of 1934, false or misleading statements in connection with public stock issues fall under the purview of Section 11 of the Securities Act of 1933. Under Section 10b the burden of proof is on the plaintiffs, who are required to show that (i) specific information was false or misleading, (ii) they relied on this information in making investment decisions, and (iii) they suffered a loss as a result. Damages under Section 10b are based on the investor's purchase price. Under Section 11, however, investors do not have to prove that they relied on false or misleading statements or that critical information was omitted from the registration statement. Instead, the burden of proof is on the *firm*, and damages under Section 11 are based on the *lower* of the IPO offer price and the investor's purchase price. As a result of the lower burden of proof and potentially larger damages, newly public companies arguably face heightened litigation and regulatory risk from inflating earnings.

There is also intense monitoring by the various parties that are involved in the IPO process (e.g., venture capitalists, underwriters, auditors, regulators). For example, Morsfield and Tan (2006) note how venture capitalists have both the expertise and sufficient reputational incentives (e.g., future fund-raising) to

serve as effective monitors. Wang et al. (2010) discuss how ownership of IPO firms tends to be concentrated among venture capitalists and institutional investors, both of which are relatively sophisticated investors and effective monitors. Moreover, as Lowry and Shu (2002, p. 310) discuss, "Because litigation is costly . . . underwriters conduct due diligence prior to the IPO, i.e., they investigate all aspects of the firm's business, finances, management, and projections and discuss their findings in the IPO prospectus." Consistent with this description, courts have typically recognized that independent verification of the registration statement and prospectus (including the financial statements) is a critical step in the underwriter's due diligence process.[5]

Auditors have especially strong incentives to scrutinize the financial statements of IPO firms. When companies register for their IPO, their financial statements fall within the scope of the Securities Act of 1933, but after going public, their financial statements fall within the scope of the Securities Exchange Act of 1934. Because exposure to litigation risk is higher under the 1933 act than the 1934 act, auditors perform higher quality audits and receive higher fees for their audits conducted in connection with IPOs (e.g., Venkataraman et al. 2008). Finally, regulators review every issuer's registration statement (i.e., Form S-1). The SEC's review is thorough and typically involves back-and-forth correspondence between the SEC and the issuer, and an offering cannot become effective until the SEC approves all of the issuer's responses to its comments.[6]

2.2. Empirical Evidence of Financial Reporting in Newly Public Companies

Despite the increased risk of litigation and heightened scrutiny of their financial statements, managers of newly public companies, it is widely believed, have especially strong incentives to misreport. Appealing to this notion, a large body of literature examines the financial reporting quality of newly public companies. Beginning with Aharony et al. (1993) and Friedlan (1994), much of the literature focuses on the magnitude of abnormal accruals in the year of the IPO and argues that large positive abnormal accruals are evidence of widespread, opportunistic misreporting. Subsequent work by Teoh et al. (1998a) finds not only large positive abnormal accruals in the year of the IPO but also a negative relation between these accruals and future abnormal stock returns.

Since these initial studies, the literature largely takes for granted that such accruals measure opportunistic misreporting and has evolved to focus on the role of third-party intermediaries in explaining cross-sectional variation in these accruals. For example, Morsfield and Tan (2006) and Wongsunwai (2013) find that venture-backed companies have lower IPO-year abnormal accruals, and Katz (2009) finds a similar result for firms with private-equity sponsors. The broad consensus in this literature is that IPO-year abnormal accruals are opportunistic and are the product of heightened incentives for misreporting.[7]

In contrast to most studies in this literature, Ball and Shivakumar (2008) show that pre-IPO and IPO accruals are more conditionally conservative (i.e., reflect bad news more timely than good news), and Cecchini et al. (2012) finds that newly public companies tend to report an allowance for doubtful accounts that is more conservative than that of more mature companies. Although Ball and Shivakumar (2008) provide evidence on conditional conservatism in newly public companies, they do not examine managers' financial reporting incentives (i.e., the relation between accruals and issue price, stock returns, or insider trades) or whether large IPO year accruals result from investment of proceeds in working capital.[8]

2.3. Accruals and Incentives in Newly Public Companies

Although prior studies claim that managers can benefit from inflating accruals in multiple ways, perhaps foremost is the claim that managers manipulate earnings to inflate the IPO issue price (e.g., Teoh

[5] For example, in the seminal case *Escott v. BarChris Construction Corp.* (283 F. Supp. 643 (S.D.N.Y. 1968)), the court determined that the underwriters had not established a "due diligence" defense largely because the lead underwriter delegated much of its diligence responsibility to counsel, who merely took the issuer's documents and statements at face value, and made no attempt to independently verify them.

[6] The SEC's review of Groupon's registration statement in advance of its IPO illustrates this process. In a letter to Groupon (dated June 29, 2011), the SEC asserted that Groupon's reported metric ACSOI, or "adjusted consolidated segment operating income," which is essentially operating income less marketing and acquisition costs, was "a non-GAAP measure that is potentially misleading to investors" and requested that Groupon "revise [its] non-GAAP measure accordingly." Groupon responded in a letter (dated July 14, 2011) by defending ACSOI as an appropriate performance metric. The SEC sent another request that the performance measure be removed. Groupon subsequently complied with the SEC's request and omitted ACSOI from its revised filing on October 10, 2011.

[7] See also Bradshaw et al. (2001), DuCharme et al. (2001, 2004), Lo (2008), and Dechow et al. (2010).

[8] Note that commonly used measures of accruals-based earnings management (e.g., the average level of abnormal accruals) and conditional conservatism (e.g., the difference in the covariance of positive and negative cash flows with accruals) are sufficiently different that it is possible for a researcher to find evidence of both conditional conservatism and earnings management in the same sample of firms.

et al. 1998a, b; Dechow et al. 2010). A higher issue price translates directly into a higher cash balance in the firm and increases the value of managers' equity holdings. Greater cash holdings can be used to undertake either positive net present value projects, increasing the value of the firm and the manager's holdings, or negative net present value projects that provide the manager with private benefits (e.g., "empire building," "pet projects," or other forms of perquisite consumption).[9]

The most frequently cited evidence that managers of newly public companies have incentives to misreport is the strong negative relation between IPO-year abnormal accruals and post-IPO stock returns (e.g., Teoh et al. 1998a). Much of the broader capital markets literature interprets this negative relation as evidence that managers benefit from inflating accruals through inflated post-IPO equity values.[10] Although this interpretation has gone largely unchallenged in the literature, recent evidence suggests that it warrants closer examination. In particular, Desai et al. (2004) suggest that because accruals and cash flows are negatively correlated, accrual-based anomalies may actually be an artifact of cash flows mispricing (i.e., the value–glamour anomaly).[11] Although Desai et al. (2004) focus on total accruals, both the expected and abnormal components of accruals are also negatively correlated with cash flows. This suggests that the relation between IPO-year abnormal accruals and subsequent stock returns may not be the result of investors being fooled by misreporting but may instead be an artifact of the correlation between cash flows and future stock returns. This is an important alternative explanation because it suggests that one of the most frequently cited benefits to inflating accruals (i.e., inflating post-IPO equity value) may not be the result of misreporting.

Prior literature points to the negative relation between IPO-year abnormal accruals and post-IPO stock returns as evidence that managers can *temporarily* inflate post-IPO equity values. However, what is left unexamined is the mechanism(s) by which managers purportedly benefit from a temporary increase in share price. Direct monetary benefits from a temporary increase in share price depend on the extent to which managers can exit their equity positions before the stock price declines. For this reason, much of the broader literature on the incentives for misreporting focuses on insider trading, or insiders' ability to exit their equity positions (e.g., Beneish et al. 2012, Cheng and Warfield 2005, Efendi et al. 2007). However, few studies focus on insider trading in the context of newly public companies.[12] This is surprising given that the IPO often represents the first opportunity for managers to diversify the (often substantial) holdings they accumulated before the company was publicly traded. Thus, one might expect to observe substantial reductions in equity holdings and high insider sales volume following the IPO because managers are diversifying their holdings. However, if equity holdings provide managers with an incentive to artificially inflate stock price before selling (i.e., pump and dump), then abnormal accruals should be related to their equity holdings and future trading profits.

2.4. Accruals and Investments in Working Capital

Prior literature on the determinants of accruals notes that abnormally large accruals are not necessarily indicative of misreporting (e.g., Guay et al. 1996, Kothari et al. 2005). For this reason, a number of studies examine the relation between accruals and the normal economic activity of the firm. The literature generally models accruals as a function of the level of fixed assets, changes in revenue, and industry membership (e.g., Jones 1991; Teoh et al. 1998a, b). The variation in accruals that is explained by these determinants is considered expected or "nondiscretionary." By contrast, the variation that is not explained by these determinants is considered "abnormal," or "discretionary," and is thought to represent earnings management. Consistent with this interpretation, several studies document a positive relation between abnormal accruals and cases of accounting fraud (e.g., Dechow et al. 2010). Accordingly, large abnormal accruals in newly public companies are commonly thought to indicate widespread misreporting.

However, an important alternative hypothesis is that large abnormal accruals in newly public companies reflect normal economic activity that is unique to IPO firms. Since accruals include changes in working capital, any large investments in working capital

[9] IPO-year earnings and accruals are not determined until year-end, which occurs after the IPO. Thus, the incentive to inflate issue price relates to accruals prior to the IPO or pre-IPO accrual (e.g., Teoh et al. 1998b, Ball and Shivakumar 2008). To the best of our knowledge, only DuCharme et al. (2001) examine the relation between pre-IPO accruals and issue price. Using a sample of 171 manufacturing companies that went public between 1982 and 1987, DuCharme et al. find that both pre-IPO accruals and cash flows are positively related to IPO issue price.

[10] For example, Bradshaw et al. (2001), among others, interpret the negative correlation between post-IPO stock returns and abnormal accruals as evidence that "firms successfully use earnings management to increase their stock prices during equity offerings" (p. 72).

[11] Desai et al. (2004) reexamine the accrual anomaly documented by Sloan (1996) and find that (i) companies in the highest and lowest accrual quintiles do not earn significantly different returns after controlling for cash flows, and (ii) cash flows subsume the explanatory power of accruals in return regressions.

[12] One exception is Darrough and Rangan (2005), who document higher than usual insider sales *volume* at firms with large abnormal accruals in the year of the IPO. However, they do not examine the profitability of these trades.

(i.e., increases in noncash current assets or reductions in current liabilities) manifest as large accruals. Moreover, unless the level of these investments is perfectly correlated with the level of fixed assets or changes in revenue (i.e., the standard determinants of expected accruals), these investments will be classified as *abnormal* accruals. This is of particular concern in the IPO setting because newly public companies typically receive a large cash inflow in the form of the IPO proceeds. Consistent with this idea, Mikkelson et al. (1997) report that 85% of IPOs list investments in working capital as an intended use of proceeds, and 69% of our sample IPOs list investments in working capital as an intended use of proceeds. If these proceeds are invested in working capital sometime between the date of the IPO and the fiscal year end, the investments will produce what looks to be large *IPO-year* abnormal accruals. This suggests that the large abnormal accruals that are typically documented in newly public companies may simply be an artifact of these firms' normal economic activity.

3. Research Design

3.1. Accruals and Incentives in Newly Public Companies

Our first set of tests examines managers' incentives for inflating IPO-year accruals.

3.1.1. Accruals and IPO Issue Price. Our first incentive test examines whether abnormal accruals inflate IPO issue price by estimating the following specification:

$$\begin{aligned} ISSUEPRICE_i = {} & \beta_0 + \beta_1 Bookval_i + \beta_2 Earnings_i \\ & + \boldsymbol{\delta}\, Year + \boldsymbol{\gamma}\, Industry + \boldsymbol{\theta}\, Venture \\ & + \boldsymbol{\varphi}\, Underwriter + \varepsilon_i, \end{aligned} \tag{1}$$

where *ISSUEPRICE* is the IPO issue price per share, *Bookval* is the book value of equity, and *Earnings* is earnings before extraordinary items. We estimate Equation (1) decomposing earnings into its operating cash flow (*CashFlow*) and total accrual components (*Accruals*) and then further decomposing total accruals into its expected (*ExpAcc*) and abnormal components (*AbAcc*). We include industry and year fixed effects (*Industry* and *Year*) to control for industry- and year-specific issue price premiums or discounts, and we include an indicator variable (*Venture*) that equals 1 if the firm has venture capital financing and 0 otherwise, as well as underwriter fixed effects (*Underwriter*) to control for premiums or discounts associated with venture capital and underwriter reputation (e.g., Gompers and Lerner 1999).[13] We estimate separate regressions specifications for all firms in the sample, for profitable firms ($Earnings > 0$) and for loss firms ($Earnings \leq 0$). All financial statement variables are measured during the fiscal year prior to the IPO (i.e., before the issue price is set) and are scaled by the number of shares outstanding immediately after the offering.[14] If abnormal accruals inflate IPO issue price, we expect to find a positive coefficient on abnormal accruals.

3.1.2. Accruals and Post-IPO Equity Valuation. Our next set of tests examines the relation between IPO-year abnormal accruals and post-IPO equity values. Following Teoh et al. (1998a), we sort companies into quartiles based on their IPO-year abnormal accruals, and we calculate buy-and-hold market-adjusted returns for each quartile over the 12-month period beginning at the end of the fourth month following the fiscal year-end.[15] We then test whether the difference in returns between the high and low abnormal accruals quartiles is negative. Next, we use two tests to assess whether the negative relation between abnormal accruals and future returns persists after controlling for cash flows.

First, we independently sort firms into four groups based on IPO-year abnormal accruals and two groups based on IPO-year cash flow, placing each firm into one of eight (4×2) bins. We then calculate the difference in returns between high and low abnormal accrual quartiles (i.e., the abnormal accrual hedge portfolio) for each cash flow group. If the correlation between abnormal accruals and returns is the result of investors being fooled by misreporting (and not driven by cash flows), then the difference in returns between extreme abnormal accrual quartiles should be negative regardless of the level of cash flows.

[13] Industry fixed effects are defined using two-digit Standard Industrial Classification (SIC) codes. Underwriter fixed effects are defined according to the lead underwriter. In untabulated analysis, we find that inferences regarding accrual variables are unaffected if fixed effects are omitted, and inferences regarding cash flow variables are strengthened.

[14] The IPO-year refers to the fiscal year during which the firm had its IPO. IPO-year earnings and accruals are not determined until year-end, which occurs after the IPO. Thus, the incentive to inflate issue price relates to accruals prior to the IPO, or pre-IPO accruals (e.g., Teoh et al. 1998b, Ball and Shivakumar 2008). Inferences are similar if we (i) require at least six months between the fiscal year-end preceding the IPO and the IPO date; (ii) use the return on the first trading day as the dependent variable; (iii) use the closing price on the first day of trading as the dependent variable; (iv) use IPO proceeds as the dependent variable and scale the independent variables by total assets; (v) group firms into portfolios based on earnings, cash flows, and accruals, and use the portfolio values or ranks as independent variables; and (vi) estimate the regression separately for IPOs occurring between 1998 and 2000, as well as IPOs occurring in all other years.

[15] This convention is intended to ensure that our tests use only IPO-year financial statement information that would have been available to market participants.

Second, we use the Fama and French (1993) model to compute average monthly risk-adjusted returns (alphas) over the respective 12-month period and test whether such returns are decreasing in IPO-year abnormal accruals before and after controlling for cash flows. There are two advantages of this approach. First, it avoids problems inherent to using long-run buy-and-hold returns (e.g., the test statistics will have more desirable statistical properties; see Mitchell and Stafford 2000). Second, it adjusts for risk in a more comprehensive manner than does simply subtracting the return of a benchmark index. These two tests provide complementary evidence on whether IPO-year abnormal accruals inflate post-IPO equity values.

3.1.3. Accruals and Insider Trading. We test whether managers inflate IPO-year abnormal accruals to temporarily increase equity values prior to selling their shares (i.e., pump and dump) by examining insider trading activity following the public disclosure of such accruals. In particular, we examine the relation between IPO-year abnormal accruals and three measures of insider trading activity over the 12-month period beginning at the end of the fourth month following the fiscal year-end: insider trading volume (*InsiderVol*), insider trade direction (*InsiderBSI*), and insider trading profits (*InsiderProfit*).[16] *InsiderVol* for firm i is total insider volume over the respective period scaled by shares outstanding. *InsiderBSI* for firm i is the volume of insider purchases less the volume of insider sales, scaled by total insider volume over the period. *InsiderProfit* for firm i is the average risk-adjusted trading profit to insider trades over the period.[17]

Risk-adjusted trading profits are calculated by first netting the insider trades for firm i on date t and then estimating the following four-factor model over the next 180 days:

$$(R_{i,t} - R_t^f) = \alpha + \beta_1(R_t^m - R_t^f) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + e_t, \quad (2)$$

where R_i is the daily return for firm i; R^f is the daily risk-free interest rate; R^m is the Center for Research in Security Prices (CRSP) value-weighted market return; *SMB*, *HML*, and *UMD* are the size, book-to-market, and momentum factors, respectively; and α ($-\alpha$) is the average daily risk-adjusted trading profit for net purchases (sales) in firm i on date t (e.g., Jagolinzer et al. 2011). Calculating risk-adjusted trading profits in this manner (i.e., estimating trade-specific factor loadings) allows risk to vary by trade.

We then regress each of *InsiderVol*, *InsiderBSI*, and *InsiderProfit* on the scaled quartile rank of abnormal accruals (*AbAcc*) and the following controls that are common in prior studies (e.g., Lakonishok and Lee 2001): the natural log of market value at the beginning of the period (*Size*), the book-to-market ratio at the beginning of the period (*BM*), and buy-and-hold returns from the IPO date to the start of the period (*PastRet*). These variables control for managers' tendency to trade in small stocks, to be value investors, and to be contrarians. Consistent with our prior tests, we also include the other components of earnings (i.e., *Cashflow* and *ExpAcc*). If managers inflate accruals to temporarily inflate equity values prior to selling their shares, we expect to find a negative relation between abnormal accruals and the buy–sell imbalance (i.e., more abnormal accruals associated with greater net insider sales) and a positive relation between abnormal accruals and insider trading profits.[18]

3.2. Accruals and Investments in Working Capital

Our second set of tests examines whether IPO-year abnormal accruals are attributable to the tendency of newly public companies to invest IPO proceeds in working capital.

3.2.1. Accruals and Timing of the IPO. Our first test of this alternative explanation uses a research design similar to that of Dechow et al. (2012). Specifically, using a sample of all available firm-years for both IPO and non-IPO firms, we estimate the following base model:

$$Accruals_{i,t} = \delta_1 IPO_{i,t} + \boldsymbol{\theta}\, Controls + \varepsilon_{i,t}, \quad (3)$$

where *Accruals* is total accruals (earnings before extraordinary items less cash flow from operations),

[16] We focus on this period because it is the period over which prior literature conjectures that IPO-year accruals inflate equity values. We consider the open-market purchases and sales of Section 16 insiders, and we exclude directors who are not also officers of the company. Section 16 insiders are defined as anyone who is a director or an officer of the company and generally includes board members, executive officers, presidents, and vice presidents. Additionally, because insiders are subject to lockup provisions that generally prevent them from trading their companies' shares until 180 days after the IPO (e.g., Field and Hanka 2001), we impose the additional restriction that the trade must be at least 180 days after the IPO. Inferences are unaffected if we examine trades over the 6, 18, or 24 months following the expiration of the lockup or do not exclude the trades of nonofficer directors.

[17] In untabulated analyses, we repeat these tests using the total fraction of shares outstanding that were issued to the public in both the primary and any secondary offerings that also occur during the fiscal year of the IPO (i.e., IPO shares plus SEO shares) as an additional dependent variable. Inferences are unaffected.

[18] Inferences are robust to excluding any or all of the control variables.

IPO is an indicator that equals 1 during the IPO-year and 0 otherwise, and *Controls* is a vector of control variables that includes $\Delta AdjRevenue_{i,t}$, $PPE_{i,t}$, $CashFlow_{i,t+1}$, $CashFlow_{i,t}$, $CashFlow_{i,t-1}$, and industry and year fixed effects.[19] Dechow et al. (2012) note that the standard approach for testing whether accruals are abnormal is to test whether the coefficient on the event period indicator—in this regression, δ_1—equals zero.

If accruals in the year of the IPO are due to investment of IPO proceeds in working capital, we expect not only large positive IPO-year accruals but also a positive relation between these accruals and IPO proceeds. Accordingly, we estimate the following modified version of Equation (3) that also controls for the proceeds received during the IPO:

$$Accruals_{i,t} = \delta_1 IPO_{i,t} + \delta_2 IPOProceeds_{i,t} + \boldsymbol{\theta} Controls + \varepsilon_{i,t}, \quad (4)$$

where *IPOProceeds* is the amount of proceeds received during the IPO and zero for all non-IPO firm-years. If large IPO-year abnormal accruals are the result of newly public companies investing IPO proceeds in working capital, we expect to find a positive relation between accruals and the amount of proceeds invested in working capital (i.e., $\delta_2 > 0$) and no evidence of IPO-year abnormal accruals (i.e., $\delta_1 = 0$).[20]

It is important to note that a test of $\delta_2 > 0$ only provides evidence of a positive correlation between proceeds and accruals, but not on the direction of causality. For example, IPO proceeds could be related to IPO-year accruals because either (i) accruals are manipulated upward, leading to higher IPO proceeds, or (ii) IPO proceeds are subsequently invested in working capital in the same fiscal year as the IPO, creating large IPO-year accruals. The key distinction between these two competing explanations lies in the timing of the IPO during the year (relative to accruals). If the actual IPO occurs early in the fiscal year (e.g., the first day of the fiscal year), then the direction of causality is more likely to run from IPO proceeds to IPO year accruals (e.g., through investment in working capital). However, if the IPO occurs late in the fiscal year (e.g., on the last day of the fiscal year), then it is more likely that the direction of causality runs from IPO-year accruals to IPO proceeds (e.g., through opportunistic misreporting).

To differentiate between these two competing explanations, we create an indicator variable, *EarlyIPO*, that equals 1 if the IPO occurs in the first six months of the fiscal year (and 0 otherwise) and include *EarlyIPO* in Equation (4) as an additional variable and interact it with *IPOProceeds*. If both the large magnitude of IPO-year accruals and their correlation with IPO proceeds are attributable to the investment of IPO proceeds in working capital, we expect to observe IPO-year accruals that are both larger and more highly correlated with IPO proceeds when the IPO occurs early in the fiscal year (when $EarlyIPO = 1$).

3.2.2. Components of Accruals and Timing of the IPO. Our second set of tests examines changes in the individual accounts that comprise accruals. If abnormal accruals are the results of investment in working capital, we expect working capital accruals to be larger than nonworking capital accruals, and we expect that the increase varies with the timing of the IPO during the fiscal year. If the IPO occurs very late (early) in the fiscal year, the firm is less (more) likely to fully utilize the IPO cash proceeds during that year. Consequently, we expect that working capital and its separate components are smaller (larger) for firms with their IPO late (early) in the year.

To test these predictions, we partition the sample into four groups based on the number of full months remaining in the fiscal year at the time of the IPO: (i) 0–2 months, (ii) 3–5 months, (iii) 6–8 months, and (iv) 9–11 months. We test for differences in the average magnitude of both abnormal and total accruals across these four groups. We then repeat these tests after decomposing total accruals (*Accruals*) into working capital accruals (ΔWC) and nonworking capital accruals (*Accruals_nonWC*), and further decomposing working capital accruals into its noncash current asset ($\Delta CurrAsset$) and current liability components ($\Delta CurrLiab$). To provide insight into the types of current asset and current liability accounts affected, we also present results for receivables ($\Delta Receivables$), inventory ($\Delta Inventory$), accounts payable ($\Delta AcctPayable$), and notes payable ($\Delta NotePayable$). If changes in these accounts are due to the investment of IPO proceeds, we expect larger increases (decreases) in asset (liability) accounts when the IPO-year financial statements capture more post-IPO investment: namely, when the IPO occurs early in the fiscal year.

[19] $\Delta AdjRevenue$ is the change in revenues minus the change in net accounts receivable, *PPE* is gross plant, property, and equipment, *CashFlow* is cash flow from operations, and all continuous variables are scaled by average total assets. Industry fixed effects are defined using two-digit SIC codes.

[20] The coefficient on IPO represents the difference between average IPO-year accruals and average accruals for the broad cross section of publicly listed firms. Because some publicly listed firms may also have large debt and stock issuances, in untabulated analyses we repeat the tests excluding all non-IPO firm-years where total debt and stock issuances exceeds 1% of total assets and find that our inferences are unaffected. Additionally, our inferences are unaffected if we (i) remove depreciation from accruals, (ii) do not subtract the change in net receivables when calculating $\Delta AdjRevenue$, and (iii) include investing cash flow in the prior, current, and subsequent years.

3.2.3. IPO-Year Accruals and AAERs. Our third test examines the relation between IPO-year accruals and the incidence of accounting fraud. A large body of literature attempts to validate that accruals capture misreporting by examining the relation between the components of accruals and the incidence of accounting fraud, measured using SEC AAERs. Accordingly, if large IPO-year accruals are generated by the investment of proceeds in working capital (rather than opportunistic misreporting), we predict (i) that such accruals should be unrelated to the incidence of AAERs and (ii) controlling for investment of proceeds in working capital should result in a stronger relation between IPO-year accruals and AAERs.[21]

We extend the research design of Richardson et al. (2006), who investigate the relation between the various components of total accruals and AAERs. Specifically, we estimate the following specification:

$$AAER_{i,t} = \delta_1 Accruals_{i,t} + \boldsymbol{\theta} Controls + \varepsilon_{i,t}, \quad (5)$$

where *AAER* is an indicator that equals 1 if an AAER identifies income-increasing earnings management in the year of the IPO; and *Controls* is a vector of control variables that includes $\Delta AdjRevenue_t$, PPE_t, $CashFlow_{t+1}$, $CashFlow_t$, $CashFlow_{t-1}$, and industry and year fixed effects. All variables are measured in the IPO-year and are as previously defined. The inclusion of these variables controls for the determinants of expected accruals (e.g., Dechow et al. 2012). The sample used to estimate Equation (5) includes only IPO firm-years. We estimate Equation (5) using a linear probability model, which, unlike probit or logit models, can accommodate a large number of industry and year fixed effects (Greene 2004).[22]

Following Richardson et al. (2006), we also estimate a version of Equation (5) after decomposing total accruals (*Accruals*) into working capital accruals (ΔWC) and nonworking capital accruals (*Accruals_nonWC*), and further decomposing ΔWC into the component that is attributable to the investment of IPO proceeds ($\Delta WC\_Proceeds$) and the component that is not ($\Delta WC\_nonProceeds$):

$$Accruals = \Delta WC\_Proceeds + \Delta WC\_nonProceeds + Accruals\_nonWC. \quad (6)$$

Since $\Delta WC\_Proceeds$ and $\Delta WC\_nonProceeds$ are not explicitly disclosed, we estimate $\Delta WC\_Proceeds$ ($\Delta WC\_nonProceeds$) as the predicted value (residual) from a regression of the change in working capital on total IPO proceeds (where both variables and the intercept are scaled by average total assets). $\Delta WC\_Proceeds$ is therefore the portion of the change in working capital that is correlated with IPO proceeds, and ΔWC is the sum of $\Delta WC\_Proceeds$ and $\Delta WC\_nonProceeds$.

If the tendency of newly public companies to invest IPO proceeds in working capital is not symptomatic of misreporting, we expect to find no relation between $\Delta WC\_Proceeds$ and the incidence of accounting fraud. Further, we expect that removing the portion of accruals that is attributable to normal economic activity will improve the power of the resulting accrual measure (i.e., $\Delta WC\_nonProceeds$) to detect misreporting and therefore expect to observe a positive relation between $\Delta WC\_nonProceeds$ and the incidence of accounting fraud.

4. Sample and Variable Measurement

4.1. Sample of Initial Public Offerings

To construct our sample of IPO companies, we first compile a list of initial public offerings in the United States between 1987 and 2006 using the Securities Data Corporation (SDC) database.[23] From SDC we collect the IPO date, the amount of proceeds raised, the IPO issue price, the number of shares offered and outstanding following the IPO, whether the firm was venture backed, and the name of the lead underwriter. We require the IPO date recorded in the SDC database to be within one month of the company's first appearance on the CRSP monthly return file. We then match this set of companies with those in the Field–Ritter data set of company founding and issue dates (Field and Karpoff 2002, Loughran and Ritter 2004) and exclude financial firms (SIC codes 6000–6999). Finally, we require Compustat data to compute abnormal accruals in the year of the IPO. The resulting sample consists of 4,340 IPO firms with data to calculate abnormal accruals in the year of the IPO (*IPO Sample*).[24]

[21] Using AAERs as a measure of misreporting has two advantages. First, the use of AAERs as a proxy for misreporting avoids assumptions about the determinants of expected accruals. Second, AAERs are likely to capture the most egregious cases of misreporting. The primary disadvantage of using AAERs as a measure of misreporting is that the existence of an AAER is conditional on detection by the SEC. Thus, our tests that are based on AAERs are joint tests of both misreporting and detection.

[22] Statistical inferences are unaffected if instead we estimate a probit model and exclude the industry and year fixed effects.

[23] We end our sample period in 2006 to avoid potentially confounding effects of the financial crisis on new listings and to ensure that our results are comparable to those in prior studies that examine IPOs during a similar period. Including IPOs during the financial crisis (i.e., from 2007 to 2009) adds 102 firms with the necessary data and does not affect our inferences.

[24] As is typical in research involving initial public offerings, we include only first-time IPOs and exclude closed-end funds, reverse leveraged buyouts (LBOs), and seasoned equity offerings.

One important issue that arises in studies that focus on IPOs is the fiscal year alignment relative to the date of the IPO. We follow prior studies and refer to the fiscal year that includes—and therefore ends after—the IPO as "the year of the IPO" or "the IPO-year." Annual financial statements for the IPO-year therefore refer to the first set of financial statements reported *after* the IPO. Similarly, the fiscal year prior to the IPO refers to the most recent set of pre-IPO financial statements that were disclosed in the prospectus and would have been available to market participants (e.g., investors, underwriters, regulators) on the IPO date.

In addition to IPO-year accruals, our tests require data on a variety of outcomes including IPO issue price, post-IPO stock returns, and measures of insider trading activity. Requiring a common sample for all of these analyses would result in a significant reduction in sample size. Accordingly, we construct a different sample for each of our tests by applying additional filters to our IPO sample (*IPO Sample*), which results in the following subsamples:

- *Issue Price Sample*. This sample is used in our analysis of IPO issue price. We begin with *IPO Sample* and impose the following additional data requirements: book value, cash flows, abnormal, and expected accruals in the year *prior* to the IPO from Compustat. This sample consists of 1,162 firms.
- *Long-Run Performance Sample*. This sample is used in our analysis of post-IPO equity valuation. We begin with *IPO Sample* and impose the following additional data requirements: monthly stock returns beginning four months after the IPO-year fiscal year-end from CRSP. This sample consists of 4,317 firms.
- *Insider Trading Sample*. This sample is used in our analysis of insider trading activity. We begin with *IPO Sample* and impose the following additional data requirements: insider trades beginning four months after the IPO-year fiscal year-end from Thomson Financial and daily stock returns during the same period from CRSP. This sample consists of 2,121 firms.
- *Individual Account Sample*. This sample is used in our analysis of individual working capital accounts. We begin with *IPO Sample* and impose the following additional data requirements: changes in working capital, changes in current assets and liabilities, change in inventories, and changes in accounts and notes payable in the year of the IPO. This sample consists of 3,960 firms.
- *Accounting Fraud Sample*. This sample is used in our analysis of accounting fraud. We begin with *IPO Sample* and impose the following additional data requirements: changes in working capital in the year of the IPO and cash flow from operations in the current, prior, and subsequent years. Additionally, we collect, but do not require, data on SEC AAERs from the Center for Financial Reporting and Management.[25] To be included in our sample, each AAER must refer to a specific period during which earnings management is alleged. Following Dechow et al. (2012), a firm is said to be named in an AAER during a given year if the SEC published an AAER that identified income-increasing earnings management during the year. This convention tracks the year of the misreporting rather than the year the AAER is announced. This sample consists of 3,699 IPO firms.

In addition to data on IPO firms, our tests also require data on accruals of non-IPO firms (to calculate abnormal accruals). We create the *Pooled Accrual Sample,* which consists of all nonfinancial (SIC codes 6000–6999) firm-years on Compustat between 1987 and 2006 that are not missing any of the following: net income; plant, property, and equipment; change in sales; change in net accounts receivable; change in working capital; total assets in the current and prior year; and cash flow from operations in the current, prior, and subsequent years. This data set is used to compare the accruals of IPO and non-IPO firms and to calculate abnormal accruals; it consists of 107,759 firm-years. The definitions of each sample, sample size, and the analyses in which they are used appears in the appendix.

4.2. Models of Abnormal Accruals

Following prior literature, we construct our measure of abnormal accruals, *AbAcc*, as abnormal accruals calculated from the modified Jones (1991) model (hereafter referred to as the MJ model) and the performance-matched model of Kothari et al. (2005) (hereafter referred to as the KLW model). Additionally, we also calculate a new measure of abnormal accruals that matches IPO firms to publicly traded firms with similar size, age, and growth (hereafter referred to as the *SAG* model). Each of these models expresses noncash earnings (i.e., accruals) as a function of economic determinants.

4.2.1. MJ Model. Our first model of abnormal accruals is the modified cross-sectional Jones (1991) model. This is the primary model used by prior studies that examine earnings management around IPOs. Following Hribar and Collins (2002), we define total accruals using the cash flow method as earnings before extraordinary items (Compustat item IBC) less cash flow from operations (Compustat item OANCF minus XIDOC). The MJ model disaggregates total accruals into its expected and abnormal

[25] This database tracks all SEC enforcement releases related to accounting fraud or misrepresentation (see Dechow et al. 2012 for a description).

components by estimating the following specification for each industry-year using all two-digit SIC code peers (excluding all observations within five years of an IPO):

$$\left(\frac{Accruals_{i,t}}{AvgTA_{i,t}}\right) = \beta_0\left(\frac{1}{AvgTA_{i,t}}\right) + \beta_1\left(\frac{\Delta REV_{i,t}}{AvgTA_{i,t}}\right) + \beta_2\left(\frac{PPE_{i,t}}{AvgTA_{i,t}}\right) + \varepsilon_{i,t}. \quad (7)$$

Expected accruals (*ExpAcc*) and abnormal accruals (*AbAcc*) for company i in year t are calculated as

$$ExpAcc_{i,t} = \hat{\beta}_0\left(\frac{1}{AvgTA_{i,t}}\right) + \hat{\beta}_1\left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{AvgTA_{i,t}}\right) + \hat{\beta}_2\left(\frac{PPE_{i,t}}{AvgTA_{i,t}}\right), \quad (8)$$

$$AbAcc_{i,t} = \left(\frac{Accruals_{i,t}}{AvgTA_{i,t}}\right) - ExpACC_{i,t},$$

where the coefficient estimates are for the respective industry-year, *Accruals* is total accruals, *AvgTA* is average total assets between years t and $t-1$ (Compustat item AT), ΔREV is change in total revenues (Compustat item SALES), ΔREC is the change in net accounts receivable (Compustat item RECT), and *PPE* is gross property, plant, and equipment (Compustat item PPEGT). Note that we scale by average total assets rather than lagged total assets to correct for the small denominator problem noted by Ball and Shivakumar (2008). In particular, to address the concern that total, abnormal, and expected IPO-year accruals may appear large only because they are scaled by pre-IPO total assets (which tend to be small relative to post-IPO total assets), we use average total assets as the deflator, since this value is arguably more representative of the economic scale of the firm during the year of the IPO.

4.2.2. KLW Model. Our next accrual model is the performance-matched model of Kothari et al. (2005). To estimate this model, we first match each observation in our IPO sample with a non-IPO firm based on year, two-digit SIC code, and earnings before extraordinary items scaled by average total assets (*Earnings*). We exclude observations where the matched firm has *Earnings* more than ±0.10 of the IPO firm (e.g., a potential match for an IPO firm with *Earnings* of 0.10 must have *Earnings* between 0 and 0.20). We then estimate abnormal accruals for both the sample firm and its matched counterpart using the MJ model. The KLW estimate is calculated as the difference between the abnormal accruals of the two firms.

4.2.3. SAG Model. Our final accrual model is a size-age-growth–matched model. To the best of our knowledge such an approach—matching on size, age, and growth—is unique to our paper. The advantage of this approach is that it calculates the abnormal accruals of IPO firms relative to non-IPO firms with similar characteristics. This approach can therefore be regarded as a statistical method for assessing whether the abnormal accruals of IPO firms are incremental to common firm characteristics that are thought to affect the accruals of public firms. One important limitation of using a matched model is that if abnormal accruals calculated using the model are not different from zero, the inference is not that earnings are not managed, but rather that earnings are not managed any more than in publicly traded firms with similar characteristics. This is a limitation inherent with using matching methods to calculate accruals and is not unique to our size-age-growth–matched model.

Our matching procedure follows KLW with two exceptions. First, we match on multiple different dimensions. Second, because we match along multiple dimensions, we employ the following propensity score matching algorithm. The matching algorithm is as follows. First, we estimate a propensity score for each firm-year. Pooling both IPO and non-IPO firm-years on Compustat during our sample period, we estimate the probability that a given observation is the firm's IPO-year as a function of the size (log of 1 plus average total assets), age (the number of years since the firm was founded), and growth (change in sales scaled by average total assets) for the firm that year.[26] The predicted values from this regression are the propensity scores. We then match each IPO firm to a non-IPO firm in the same industry and year that minimizes the squared difference in propensity score between the IPO firm-year and the non-IPO firm-year. Finally, we estimate SAG abnormal accruals for both the firm and its matched counterpart as the difference between the MJ model abnormal accruals of the two firms.

4.3. Descriptive Statistics

Table 1 presents descriptive statistics for our primary sample (*IPO Sample*). Panel A reports statistics for firm characteristics. Firms in our sample have an average issue price of \$12.19 (mean *IssuePrice* = 12.19), and 44% of firms are venture backed (mean *Venture* = 0.44).[27] We find that average proceeds received from

[26] Perhaps not surprisingly, we find that firm size and age are negatively related to the IPO-year indicator and that growth is positively related to the IPO-year indicator. These relations are all statistically significant at the 1% level or less (two tailed).

[27] This percentage is similar to that reported by Morsfield and Tan (2006), who find that 43% of their sample firms from 1983 to 2001 are venture backed.

Table 1 Sample Descriptive Statistics

Panel A: Firm characteristics

Variable	Mean	Std. dev.	25%	Median	75%
IssuePrice	12.19	4.96	8.50	12.00	15.00
Venture	0.44	0.50	0.00	0.00	1.00
Proceeds	0.91	0.67	0.41	0.77	1.25
Earnings	−0.10	0.37	−0.21	0.03	0.10
CashFlow	−0.07	0.32	−0.19	0.01	0.12
Accruals	−0.03	0.19	−0.11	−0.03	0.06
Δ *WC*	0.06	0.15	−0.02	0.04	0.12
Δ *WC_nonProceeds*	0.01	0.15	−0.07	−0.004	0.08
Δ *WC_Proceeds*	0.05	0.03	0.03	0.05	0.06

Panel B: Abnormal accruals: Descriptive statistics

Variable	Model	Mean	*t*-stat	Median	*p*-value	25%	75%
AbAcc	MJ model	0.02	4.67	0.01	0.03	−0.07	0.10
AbAcc	KLW model	0.01	2.86	0.01	0.001	−0.10	0.14
AbAcc	SAG model	0.004	1.33	0.01	0.01	−0.12	0.14

Panel C: Abnormal accruals: Correlation matrix

		Abnormal accrual model			
		MJ model	KLW model	SAG model	
Abnormal accrual model	Variable	*AbAcc*	*AbAcc*	*AbAcc*	*CashFlow*
MJ model	*AbAcc*	1.00	0.53	0.57	−0.08
KLW model	*AbAcc*	0.56	1.00	0.38	−0.35
SAG model	*AbAcc*	0.60	0.40	1.00	−0.03
	CashFlow	−0.18	−0.39	−0.11	1.00

Notes. This table presents descriptive statistics for the variables used in our analyses. Panel A presents summary statistics for various firm characteristics. Panel B presents results from testing whether mean and median abnormal accruals are different from zero; *t*-stat (*p*-value) tests for whether the mean (median) is statistically different from zero (two tailed). Panel C presents Pearson (Spearman) correlations for our three measures of abnormal accruals above (below) the diagonal. All correlations are statistically significant at the 5% level (two tailed). *IssuePrice* is the issue price per share of the IPO. *Venture* is an indicator variable if the firm is venture backed. *Proceeds* is proceeds raised in the IPO, *Earnings* is net income before extraordinary items (Compustat item IBC), *Cashflow* is cash flow from operations (item OANCF − item XIDOC), *Accruals* is total accruals (*Earnings* minus *Cashflow*), Δ *WC* is change in noncash working capital (item ACT − item CHE − item LCT + item DLC), Δ *WC_nonProceeds* is the portion of the change in working capital uncorrelated with IPO proceeds, and Δ *WC_Proceeds* is the portion of the change in working capital correlated with IPO proceeds, all scaled by average assets. *AbAcc* is abnormal accruals calculated according to either the MJ model, the KLW model, or the SAG model. All variables are calculated during the year of the IPO and are winsorized at the 1st and 99th percentiles. Sample of 4,340 IPOs from SDC with data on IPO-year abnormal accruals from Compustat.

the IPO equals 91% of average assets (*Proceeds*) and that the average increase in working capital in the year of the IPO is 6% of assets (Δ *WC*). Decomposing the increase in working capital into its two components, we find that investment of IPO proceeds in working capital (Δ *WC_Proceeds*) is on average 5% of assets. Thus, investments of IPO proceeds account for 83.33% (0.05/0.06) of the increase in working capital.[28]

Panel B of Table 1 presents distributional statistics and significance tests for each of the three abnormal accrual models. In particular, we present the mean, median, and 25th and 75th percentiles of abnormal accrual estimates from each model. We also present the results of statistical tests for whether mean and median abnormal accruals are different from zero. Consistent with prior work that documents significant positive abnormal accruals in the year of the IPO. Panel B shows that mean and median abnormal accruals from the MJ model and KLW model are reliably positive. Notably, however, mean abnormal accruals from the SAG model are not statistically distinguishable from zero at conventional levels. This finding suggests that the average IPO firm has accruals that are similar in magnitude to those of its size-age-growth–matched non-IPO firm-year. Median abnormal accruals using the SAG model are different from zero at the 1% level (two tailed). Panel C of Table 1 presents Pearson (Spearman) correlations between abnormal and expected accruals and cash flows above (below) the diagonal. We find that the three measures of abnormal accruals are positively correlated with each other (Spearman correlations between 0.40

[28] Recall that Δ*WC* is the sum of Δ*WC_Proceeds* and Δ*WC_nonProceeds*.

and 0.60, Pearson correlations between 0.38 and 0.57), and negatively correlated with cash flows (Spearman correlations between −0.18 and −0.39, Pearson correlations between −0.08 and −0.35). All correlations are statistically significant at the 5% level.

5. Results

5.1. Accruals and Incentives in Newly Public Companies

5.1.1. Accruals and IPO Issue Price. Table 2 presents results from estimating the IPO issue price model given by Equation (1). We estimate regression specifications separately for all IPOs, for IPOs where pre-IPO earnings before extraordinary items are positive ("Profit sample"), and for IPOs where pre-IPO earnings before extraordinary items are nonpositive ("Loss sample"). We find a positive, albeit weak, relation between cash flows and IPO issue price (*t*-statistics (*t*-stats) of 1.80, 1.65, and 1.70 for columns (1), (4), and (7), respectively), and no relation between IPO issue price and either abnormal or expected accruals. The results are similar for both profitable and unprofitable firms, although cash flow becomes insignificant, possibly because of a reduction in sample size.

In untabulated analysis, we exclude venture capital and underwriter fixed effects and find a strong positive relation between cash flows and issue price (*t*-stats of 5.04, 5.51, and 5.28 for columns (1), (4), and (7), respectively) and no significant relation between issue price and either abnormal or expected accruals. The adjusted R^2 values for these specifications drop from about 66.20% to about 17.16%, which suggests that venture capital and underwriting explain a substantial amount of the cross-sectional variation in IPO issue price.

Across all specifications, the evidence suggests that investment bankers do not consider the abnormal accrual component of earnings when setting issue price. This result is inconsistent with assertions in the literature that managers benefit from high accruals through an inflated issue price. Because of the substantial reduction in sample from requiring pre-IPO data, we caveat that the generalizability of these results is unclear.

5.1.2. Accruals and Post-IPO Equity Valuation. Panel A of Table 3 presents 12-month market-adjusted

Table 2 IPO Valuation: Issue Price and Accruals

	Accrual model								
	MJ model			KLW model			SAG model		
	All obs.	Profit sample	Loss sample	All obs.	Profit sample	Loss sample	All obs.	Profit sample	Loss sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BookVal	−0.03	0.09	−**0.19***	−0.02	0.05	−0.13	−0.02	0.07	−**0.17***
	(−0.38)	(0.94)	(−1.72)	(−0.32)	(0.54)	(−1.19)	(−0.34)	(0.81)	(−1.68)
CashFlow	**0.36***	0.46	0.42	**0.37***	0.53	0.22	**0.32***	0.36	0.29
	(1.80)	(1.15)	(1.23)	(1.65)	(1.21)	(0.56)	(1.70)	(1.15)	(0.80)
ExpAcc	0.18	**0.60***	0.10	**0.22***	0.44	0.04	0.10	0.25	0.03
	(0.96)	(1.81)	(0.35)	(1.66)	(1.59)	(0.25)	(0.74)	(1.35)	(0.16)
AbAcc	0.11	0.19	0.10	0.13	0.29	0.07	0.08	0.21	−0.02
	(0.89)	(0.92)	(0.48)	(1.14)	(1.16)	(0.46)	(0.78)	(1.52)	(−0.13)
Fixed effects									
Industry and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Venture capital	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead underwriter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	66.21	76.41	68.33	66.65	77.23	68.94	66.20	76.10	68.41
N	1,162	565	597	1,162	565	597	1,162	565	597

Notes. This table presents results from estimating IPO issue price (*IssuePrice*) as a function of venture backing, underwriter affiliation, book value of equity, cash flows, and accruals for the fiscal year-end immediately prior to the IPO and disclosed in the prospectus. *IssuePrice* is the issue price per share of the IPO, *BookVal* is the book value of equity for the year prior to the IPO, *Cashflow* is cash flow from operations for the year prior to the IPO, *ExpAcc* is expected accruals for the year prior to the IPO (*Accruals* minus *AbAcc*), and *AbAcc* is abnormal accruals for the year prior to the IPO. *AbAcc* is calculated according to either the MJ model, the KLW model, or the SAG model. All financial statement variables are scaled by shares outstanding following the offering. We estimate regression specifications separately for all IPOs, for IPOs where pre-IPO earnings before extraordinary items is positive ("Profit sample"), and for IPOs where pre-IPO earnings before extraordinary items is nonpositive ("Loss sample"). Sample of 1,162 IPOs from SDC with data on issue price, shares outstanding, and abnormal accruals in the year prior to the IPO from Compustat. *t*-statistics appear in parentheses and are calculated based on standard errors clustered by IPO date.

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively (two tailed).

Table 3 Post-IPO Valuation: Long-Run Performance and Accruals

Panel A: Market-adjusted buy-and-hold returns

Accrual model	Sort variable	Low 1	2	3	High 4	Diff Q4 – Q1
MJ model	*AbAcc*	−3.95	**−10.67*****	**−10.06*****	**−11.59*****	**−7.64****
		(−1.33)	(−4.73)	(−4.42)	(−4.24)	(−2.09)
KLW model	*AbAcc*	−2.36	**−8.59*****	**−8.87*****	**−15.29*****	**−12.93*****
		(−0.83)	(−3.62)	(−3.72)	(−5.50)	(−3.25)
SAG model	*AbAcc*	**−5.04****	**−6.87****	**−11.02*****	**−13.32*****	**−8.28****
		(−1.82)	(−2.54)	(−4.48)	(−5.66)	(−2.28)
	CashFlow	**−18.59*****	**−9.89*****	**−8.73*****	0.80	**19.38*****
		(−6.38)	(−3.66)	(−3.62)	(0.36)	(5.33)

Panel B: Market-adjusted buy-and-hold returns partitioning by cash flow

		AbAcc quartile				
Accrual model	Sample partition	1 (low)	2	3	4 (high)	Diff Q4 – Q1
MJ model	Above median *CashFlow*	−1.00	−4.35	−6.07	−5.28	−4.28
		(−0.30)	(−1.47)	(−2.15)	(−1.26)	(−0.77)
	Below median *CashFlow*	−7.99	**−20.92*****	**−14.85*****	**−14.09*****	−6.10
		(−1.50)	(−6.16)	(−4.00)	(−4.11)	(−1.01)
KLW model	Above median *CashFlow*	−1.10	−3.67	−6.67	−4.90	−3.80
		(−0.35)	(−1.24)	(−2.27)	(−0.99)	(−0.62)
	Below median *CashFlow*	−4.83	**−18.88*****	**−10.74*****	**−18.03*****	**−13.20*****
		(−0.83)	(−4.83)	(−2.95)	(−5.54)	(−2.11)
SAG model	Above median *CashFlow*	3.76	**−4.99***	**−9.39*****	**−5.95***	**−9.71***
		(1.01)	(−1.65)	(−3.48)	(−1.75)	(−1.79)
	Below median *CashFlow*	**−15.23*****	**−9.64***	**−12.87*****	**−17.11*****	−1.88
		(−3.75)	(−1.93)	(−3.01)	(−5.53)	(−0.37)

buy-and-hold returns by abnormal accrual and cash flow quartile for each of the three abnormal accrual models. Across all three abnormal accrual models, we find that IPO-year abnormal accruals predict negative future abnormal returns.[29] This result is important because it suggests that the various accrual models are *not* randomly decomposing total accruals. Consistent with Teoh et al. (1998a), across all three models, the difference in returns between the high and low IPO-year abnormal accrual quartiles is both economically large (estimates range from −7.64% to −12.93%) and statistically significant (t-stats of −2.09, −3.25, and −2.28 for the MJ, KLW, and SAG models, respectively). The bottom row of panel A shows that the difference between the high and low cash flow quartiles is 19.38%, which is also economically large and statistically significant (t-stat of 5.33). The fact that the difference in returns between cash flow quartiles is of similar magnitude, but of opposite sign, is consistent with the negative correlation between the two variables (see correlations in panel C of Table 1) and indicates that these two variables capture common information (e.g., Desai et al. 2004).

In panels B and C of Table 3, we present formal tests of the incremental ability of cash flows and abnormal accruals to explain future returns. Panel B presents results from repeating the preceding test after independently sorting firms into groups based on whether IPO-year cash flows are above or below the median.[30] We find that partitioning the sample on cash flows greatly diminishes the predictive ability of abnormal accruals. For the MJ model, the difference in returns between extreme accruals quartiles is statistically indistinguishable from zero for both high and low cash flow groups (t-stats of −0.77 and −1.01, respectively) and returns are nonmonotonic. For the KLW model, the difference in returns between extreme accruals quartiles is statistically significant only in the low cash flow group (t-stats of −2.11), but again, returns are nonmonotonic: the second and

[29] In untabulated analysis, we find no evidence of a relation between expected accruals and future returns. This suggests that the various accrual models are not randomly decomposing total accruals.

[30] Extreme abnormal accruals portfolios are still well populated even after partitioning on above/below median cash flow and consistently have in excess of 200 observations.

Table 3 (Continued)

Panel C: Monthly risk-adjusted stock returns

		Accrual model					
		MJ model		KLW model		SAG model	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	**−0.88****	−0.57	−1.19	−0.32	−0.68	−0.55	−1.20
	(−2.40)	(−1.46)	(−1.31)	(−1.00)	(−0.77)	(−1.57)	(−1.28)
MKTRF	**1.30*****	**1.30*****	**1.30*****	**1.30*****	**1.30*****	**1.30*****	**1.30*****
	(14.98)	(14.98)	(14.98)	(14.98)	(14.98)	(14.97)	(14.97)
SMB	**1.08*****	**1.08*****	**1.08*****	**1.08*****	**1.08*****	**1.08*****	**1.08*****
	(6.79)	(6.79)	(6.79)	(6.79)	(6.79)	(6.78)	(6.78)
HML	**−0.50*****	**−0.50*****	**−0.50*****	**−0.50*****	**−0.50*****	**−0.51*****	**−0.51*****
	(−3.31)	(−3.31)	(−3.31)	(−3.31)	(−3.31)	(−3.33)	(−3.33)
CashFlow			**1.33****		**1.13****		**1.37****
			(2.04)		(2.08)		(2.13)
ExpAcc			−0.32		−0.52		−0.13
			(−0.74)		(−1.15)		(−0.26)
AbAcc		**−0.63****	−0.41	**−1.10****	−0.66	**−0.67***	−0.56
		(−1.96)	(−0.86)	(−3.20)	(−1.08)	(−1.92)	(−1.01)
Adj. R^2 (%)	12.60	12.61	12.65	12.86	12.89	12.62	12.66
N	50,201	50,201	50,201	50,201	50,201	50,201	50,201

Notes. This table presents average abnormal returns for each IPO-year abnormal accrual quartile. Firms are ranked into quartiles based on financial statement information for the fiscal year-end immediately following the IPO. Panel A presents buy-and-hold market-adjusted returns by abnormal accrual (*AbAcc*) and cash flow (*CashFlow*) quartile. Panel B presents buy-and-hold market-adjusted returns by abnormal accrual quartile (*AbAcc*) after partitioning the sample based on whether the firm's cash flow is above or below median. Buy-and-hold returns are calculated assuming a 12-month holding period beginning four months after the fiscal year-end immediately following the IPO. Panel C presents results from estimating monthly returns in excess of the risk-free rate, over this 12-month period as a function of the Fama–French factors (*MKTRF*, *SMB*, *HML*), and the scaled quartile rank of abnormal accruals (*AbAcc*), expected accrual (*ExpAcc*), and cash flow (*CashFlow*). Ranks are scaled to range from 0 to 1. The MJ model refers to the modified Jones model, the KLW model refers to the performance matched model described in Kothari et al. (2005), and the SAG model refers to the size-age-growth–matched model described in §4.2. Sample of 4,317 IPOs from SDC with data on IPO-year abnormal accruals from Compustat and data on monthly stock returns over the 12-month period beginning four months after the IPO-year fiscal year-end from CRSP (50,201 firm-months); *t*-statistics appear in parentheses and are based on standard errors clustered by IPO date.

***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively (two tailed).

fourth quartiles have similar returns. For the SAG model, the difference in returns between extreme accruals quartiles is statistically significant only in the high cash flow group (*t*-stats of −1.79), but again, returns are nonmonotonic: the second and fourth quartiles have similar returns. At a minimum, these results indicate that it is important to consider the firm's cash flows when assessing the predictive ability of accruals for future returns.

Panel C of Table 3 presents the results of estimating a regression of monthly excess returns on the three Fama and French (1993) factors and the scaled quartile ranks (i.e., ranks ranging from 0 to 1) of cash flow from operations, expected accruals, and abnormal accruals. The first column shows that all three of the Fama–French factors are statistically significant in our sample. Consistent with the IPO underperformance literature (e.g., Loughran and Ritter 1995), the intercept, or alpha, is negative and significant (*t*-stat of −2.40), which indicates that, on average, newly public companies earn negative abnormal returns in the 12 months following their IPO. Columns (2), (4), and (6) present results when the various estimates of abnormal accruals are included in the model. Consistent with our earlier results, across all three models, we find a significant negative relationship between future abnormal returns (relative to the Fama–French factors) and abnormal accruals. The coefficient estimates indicate that moving from the lowest to the highest quartile of abnormal accruals, abnormal returns increase by −0.63%, −1.10%, and −0.67% per month for the MJ model, KLW model, and SAG model, respectively (*t*-stats of −1.96, −3.20, and −1.92, respectively). Columns (3), (5), and (7) simultaneously consider all three earnings components. Across all three abnormal accrual models, we find that abnormal accruals are no longer significant but that cash flows are significant (*t*-stats of 2.04, 2.08, and 2.13 for the MJ, KLW, and SAG models, respectively).[31] Thus, after controlling for cash flows, abnormal accruals are unrelated to future abnormal returns.

[31] Note that the coefficients on the Fama–French factors do not change across regression specifications because the abnormal accrual quartile is independent of the risk factor. The former varies across firms in a given month, whereas the latter takes the same value for all firms in a given month.

Table 4 Insider Trading and Accruals

	Measure of insider trading activity								
	InsiderVol			*InsiderBSI*			*InsiderProfit*		
Accrual model: Variable	MJ model (1)	KLW model (2)	SAG model (3)	MJ model (4)	KLW model (5)	SAG model (6)	MJ model (7)	KLW model (8)	SAG model (9)
Size	**−0.010*****	**−0.010*****	**−0.010*****	−0.06	−0.05	−0.06	−0.03	−0.03	−0.03
	(−5.33)	(−5.50)	(−5.30)	(−1.02)	(−0.89)	(−1.02)	(−1.05)	(−1.28)	(−1.06)
BM	**−0.005*****	**−0.005*****	**−0.005*****	**0.41*****	**0.39*****	**0.40*****	0.01	0.01	0.01
	(−2.85)	(−2.92)	(−2.78)	(7.53)	(7.03)	(7.43)	(0.64)	(0.44)	(0.65)
PastRet	**0.008*****	**0.008*****	**0.008*****	**−0.37*****	**−0.38*****	**−0.37*****	**−0.05****	**−0.05****	**−0.04***
	(5.12)	(4.92)	(5.10)	(−7.31)	(−7.58)	(−7.30)	(−1.98)	(−2.14)	(−1.95)
CashFlow	**0.005*****	**0.005****	**0.005*****	**−0.23*****	**−0.22*****	**−0.23*****	**−0.04***	**−0.05****	**−0.05****
	(2.78)	(2.51)	(2.73)	(−4.49)	(−3.99)	(−4.49)	(−1.89)	(−1.98)	(−1.96)
ExpAcc	0.001	0.003	0.003	−0.02	−0.05	−0.08	0.02	0.01	−0.02
	(0.69)	(1.30)	(1.38)	(−0.38)	(−0.79)	(−1.24)	(1.00)	(0.26)	(−0.60)
AbAcc	0.003	0.003	0.003	−0.10	−0.05	−0.11	−0.02	−0.01	−0.03
	(0.70)	(1.24)	(1.19)	(−0.98)	(−0.75)	(−1.57)	(−0.63)	(−0.26)	(−1.02)
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	8.33	10.32	10.25	19.74	19.97	19.65	4.80	5.09	4.75
N	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120

Notes. This table presents results from estimating insider trading activity following the IPO as a function of abnormal accruals (*AbAcc*) and control variables (*Size*, *BM*, *PastRet*, *CashFlow*, and *ExpAcc*). We use three measures of insider trading activity: average insider trading volume (*InsiderVol*), average insider buy–sell imbalance (*InsiderBSI*), and average abnormal insider trading profits (*InsiderProfit*). *Size* is the natural log of total assets at the end of the fiscal year, *BM* is the book-to-market ratio at the end of the fiscal year, *PastRet* is the market-adjusted buy-and-hold return from the IPO date until four months after the fiscal year end, and all other variables are as previously defined. *Size*, *BM*, *AbAcc*, *ExpAcc*, and *CashFlow* are based on financial statement information for the fiscal year-end immediately following the IPO, all independent variables are ranked into quartiles and scaled to range between 0 and 1, and all specifications include unreported industry and year fixed effects. Sample of 2,121 IPOs from SDC with data on IPO-year abnormal accruals from Compustat and data on trades by executive officers over the 12-month period beginning four months after the IPO-year fiscal year-end on Thomson Financial; *t*-statistics appear in parentheses and are based on standard errors clustered by IPO date.

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively (two tailed).

The results of Table 3 are inconsistent with the notion that managers systematically inflate IPO-year accruals to inflate post-IPO equity values. Instead, our results suggest that high accrual firms also tend to have low cash flows and that the relationship between IPO-year abnormal accruals and subsequent stock returns is an artifact of cash flow mispricing documented in prior research (e.g., Desai et al. 2004). Collectively, the evidence in Tables 2 and 3 casts doubt on the notion that managers who inflate abnormal accruals benefit from a higher issue price or higher post-IPO equity valuation.

5.1.3. Accruals and Insider Trading. Table 4 presents the results of estimating three measures of insider trading activity—volume (*InsiderVol*), direction (*InsiderBSI*), and profitability (*InsiderProfit*)—as a function of the scaled quartile ranks of firm size; book-to-market ratio; return momentum; and cash flow from operations, expected accruals, and abnormal accruals. Consistent with prior research (e.g., Lakonishok and Lee 2001), we find that insiders tend to (i) trade more in small firms (*t*-stats of −5.33, −5.50, and −5.30 on *Size* in columns (1)–(3)), (ii) be value investors (*t*-stats of 7.53, 7.03, and 7.43 on *BM* in columns (4)–(6)), and (iii) be contrarian investors (*t*-stats of −7.31, −7.58, and −7.30 on *PastRet* in columns (4)–(6)). Regarding earnings variables, the magnitude and statistical significance of the coefficients on *CashFlow* mirror that for *PastRet*, suggesting that insiders tend to be both cash flow and return contrarians. By contrast, examining variation in insider trading activity based on the level of abnormal accruals, we find no evidence of a relation between abnormal accruals and trade volume, direction, or profitability. These findings are inconsistent with the notion that managers inflate accruals to temporarily boost stock price prior to selling their shares.

5.2. Accruals and Investments in Working Capital

5.2.1. Accruals, Proceeds, and Timing of the IPO. Table 5 presents results from our tests of whether the accruals of newly public companies are related to the amount of IPO proceeds invested in working capital. Column (1) presents results from estimating Equation (3). Consistent with prior studies, we find that the coefficient on *IPO* is positive and significant (coefficient of 0.05 on *IPO*, *t*-stat of 9.02), which indicates that IPO-year accruals tend to be larger than

Table 5 Accruals, Proceeds, and Timing of the IPO

Variable	All obs. (1)	All obs. (2)	All obs. (3)	All obs. (4)	Profit sample (5)	Loss sample (6)
IPO_t	**0.05*****	0.006	−0.002	0.01	**−0.02*****	0.001
	(9.02)	(0.98)	(−0.29)	(1.11)	(−5.92)	(0.07)
$IPOProceeds_t$		**0.05*****	**0.05*****	**0.04*****	**0.04*****	**0.07*****
		(3.73)	(4.26)	(2.95)	(8.88)	(2.76)
$EarlyIPO_t$			**0.02*****	0.01	0.001	0.01
			(4.18)	(0.51)	(0.26)	(0.67)
$EarlyIPO_t \times IPOProceeds_t$				**0.02*****	**0.02****	0.03
				(2.63)	(2.34)	(1.22)
Control variables						
$\Delta\ AdjRevenue_t$	**0.05*****	**0.05*****	**0.05*****	**0.05*****	**0.04*****	**0.03*****
	(4.77)	(4.75)	(4.75)	(4.76)	(11.51)	(2.60)
PPE_t	**−0.08*****	**−0.08*****	**−0.08*****	**−0.08*****	**−0.04*****	**−0.08*****
	(−21.28)	(−21.22)	(−21.22)	(−21.23)	(−16.53)	(−10.10)
$CashFlow_{t+1}$	**0.20*****	**0.20*****	**0.20*****	**0.20*****	**0.04*****	**0.20*****
	(10.69)	(10.72)	(10.71)	(10.70)	(5.73)	(8.89)
$CashFlow_t$	**−0.10*****	**−0.10*****	**−0.10*****	**−0.10*****	**−0.66*****	**−0.08****
	(−2.75)	(−2.74)	(−2.73)	(−2.73)	(−34.02)	(−2.22)
$CashFlow_{t-1}$	**0.34*****	**0.34*****	**0.34*****	**0.34*****	**0.08*****	**0.32*****
	(19.67)	(19.71)	(19.70)	(19.70)	(5.43)	(21.38)
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	27.86	27.87	27.87	27.87	58.63	25.74
N	107,759	107,759	107,759	107,759	64,724	43,035

Notes. This table presents results from estimating accruals as a function of an indicator variable for whether the firm had its IPO that year, the amount of proceeds raised in the IPO, and an indicator for whether the IPO occurred early or late in the fiscal year:

$$Accruals = \delta_1\ IPO + \delta_2\ IPOProceeds + \delta_3\ EarlyIPO + \delta_4\ EarlyIPO \times IPOProceeds + \boldsymbol{\theta}\ Controls + \varepsilon.$$

The regression is estimated pooling across all IPO and non-IPO firm-years. *Accruals* is total accruals scaled by average assets, *IPO* is an indicator variable for whether the firm had its IPO during the fiscal year, *IPOProceeds* is total IPO proceeds scaled by average assets, *EarlyIPO* is an indicator variable if the IPO occurred with six or more months remaining in the fiscal year (*IPOProceeds* and *EarlyIPO* equal 0 for non-IPO firm-years), and *Controls* is a vector of control variables including $\Delta\ AdjRevenue_t$, PPE_t, $CashFlow_{t+1}$, $CashFlow_t$, $CashFlow_{t-1}$, and industry and year fixed effects. $\Delta\ AdjRevenue$ is the change in revenues less the change in net accounts receivables, *PPE* is gross plant, property, and equipment, and *CashFlow* is cash flow from operations, all scaled by average assets. We estimate regression specifications separately for all firm-years, for firm-years where earnings before extraordinary items is positive ("Profit sample") and for firm-years where earnings before extraordinary items is nonpositive ("Loss sample"). Sample of 107,759 firm years on Compustat. t-statistics appear in parentheses and are calculated based on standard errors clustered by firm and year.

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively (two tailed).

expected based on the control variables. Regarding the control variables, we find a significant positive relation between accruals and the change in revenue and cash flows in the subsequent and previous years (t-stats of 4.77, 10.69, and 19.67, respectively). We also find a significant negative relation between accruals and both plant, property, and equipment and cash flows in the current year (t-stats of −21.28 and −2.75, respectively).[32]

Column (2) presents results from estimating Equation (4). Consistent with IPO firms investing their proceeds in working capital which, in turn, leads to larger abnormal accruals, we find a strong positive relation between accruals and IPO proceeds (t-stat of 3.73 on *IPOProceeds*), and no evidence that IPO-year accruals are abnormal after controlling for IPO proceeds (t-stat of 0.98 on *IPO*). This result suggests that firms that raise greater IPO proceeds (as a fraction of total assets) tend to have higher accruals and that abnormal IPO-year accruals are explained entirely by the amount of IPO proceeds.

Column (3) shows that IPOs early in the fiscal year have larger IPO-year accruals (t-stat of 4.18 on *EarlyIPO*) and a larger correlation between accruals and IPO proceeds (t-stat of 2.63 on $EarlyIPO_t \times IPOProceeds_t$). These results are consistent with IPO proceeds influencing IPO-year accruals, and not vice versa. Finally, columns (5) and (6) present results after partitioning the sample into profit ($Earnings > 0$) and loss ($Earnings \leq 0$) firms. We find that the amount

[32] The signs of all control variables are identical to those reported in prior research (e.g., Dechow et al. 2012). However, the level of statistical significance is generally less than that reported in prior studies because we calculate t-statistics based on standard errors that are clustered by firm and year to account for time-series and cross-sectional dependence, respectively.

of IPO proceeds is significantly related to accruals in both specifications (t-stats of 8.88 and 2.76, respectively) and that only the coefficients on *PPE*, $CashFlow_{t+1}$, $CashFlow_t$, and $CashFlow_{t-1}$ are significantly different across the two samples (p-values less than 0.01, two tailed).

5.2.2. Components of Accruals and Timing of the IPO. Table 6 presents estimates of accruals and its components after partitioning the sample into four groups based on the number of months remaining in the fiscal year at the time of the IPO: 0–2 months, 3–5 months, 6–8 months, and 9–11 months. Panel A presents average IPO-year abnormal accruals for each group. Across all three models, we find that IPO-year abnormal accruals are generally increasing in the number of months between the IPO and the fiscal year-end: firms with IPO-year financial statements that reflect more post-IPO activity (in the extreme 11 months of post-IPO activity) tend to have higher abnormal accruals. Notably, abnormal accruals are only statistically and economically different from zero when the IPO occurs with 6–11 months remaining in the fiscal year. This result is consistent with abnormally high IPO-year accruals primarily reflecting post-IPO activities and the investment of IPO proceeds in working capital.

Panel B in Table 6 presents average accruals and its components for each of the four groups. The panel shows that the large accruals for firms with their IPO early in their fiscal year (with 9–11 months remaining) stem primarily from difference in receivables and payables. First, firms with IPOs early in the year have the largest increases in receivables. This is consistent with both firms managing receivables upward after the IPO and with IPO raising the visibility of the company's products. Second, although all IPO firms tend to experience an increase in their accounts payable, firms with IPOs early in the year are less likely to be cash constrained and experience less of an increase in payables than their counterparts that have their IPO late in the year. Ceteris paribus, a smaller increase in accounts payable implies a larger increase in working capital and hence larger accruals. Table 6 shows that these differences are both statistically and economically significant. Collectively, Table 6 suggests that

Table 6 Components of Accruals and Timing of the IPO

		Months from IPO date until fiscal year end				
Accrual model	All obs. (1)	0–2 months (2)	3–5 months (3)	6–8 months (4)	9–11 months (5)	Diff (5) − (2)
Panel A: Abnormal accruals by timing of IPO relative to fiscal year-end						
MJ model	**0.013*****	**−0.013****	0.011	**0.031*****	**0.025*****	**0.038*****
	(3.82)	(−2.06)	(1.60)	(5.17)	(3.38)	(3.88)
KLW model	**0.011*****	**−0.016***	0.011	**0.026*****	**0.027*****	**0.043*****
	(2.43)	(−1.84)	(1.18)	(3.15)	(2.61)	(3.20)
SAG model	0.006	**−0.028*****	−0.001	**0.028*****	**0.031*****	**0.059*****
	(1.13)	(−2.90)	(−0.14)	(3.12)	(2.60)	(3.88)
Panel B: Individual working capital accounts by timing relative to fiscal year-end						
Accruals	−0.028	−0.047	−0.032	−0.007	−0.025	**0.022***** (2.75)
Accruals_nonWC	−0.088	−0.087	−0.090	−0.080	−0.096	−0.009 (−1.57)
Δ *WC*	0.060	0.039	0.059	0.073	0.071	**0.032***** (4.99)
Δ *CurrAsset*	0.134	0.125	0.134	0.144	0.133	0.008 (1.15)
Δ *Receivables*	0.074	0.068	0.074	0.077	0.078	**0.010**** (2.12)
Δ *Inventory*	0.042	0.039	0.040	0.048	0.040	0.001 (0.35)
Δ *CurrLiab*	0.075	0.085	0.075	0.072	0.063	**−0.022***** (−4.33)
Δ *AcctPayable*	0.032	0.036	0.029	0.035	0.024	**−0.012***** (−4.40)
Δ *NotePayable*	−0.017	−0.016	−0.017	−0.017	−0.019	−0.003 (−0.89)

Notes. This table presents average abnormal accruals and changes in individual working capital accounts for the IPO year, after partitioning the sample based on the number of months between the IPO and the fiscal year-end. We partition our sample of IPO firms into four groups: firms where the fiscal year-end occurs 0–2 months, 3–5 months, 6–8 months, and 9–11 months after the IPO. Panel A presents estimates of abnormal accruals (*AbAcc*) for each group and tests for a difference in accruals between the extreme groups. *AbAcc* is abnormal accruals calculated according to either the modified Jones model (MJ model), the performance matched model described in Kothari et al. (2005) (KLW model), or the size-age-growth–matched model described in §4.2 (SAG model). Panel B presents accruals and components of accruals for each group and tests for a difference between the extreme groups. *Accruals* is total accruals, Δ *WC* is change in noncash working capital, *Accruals_nonWC* is nonworking capital accruals (*Accruals* less Δ *WC*), Δ *CurrAsset* is change in current assets, Δ *Receivables* is change in receivables, Δ *Inventory* is change in inventory, Δ *CurrLiab* is change in current liabilities, Δ *AcctPayable* is change in accounts payable, and Δ *NotePayable* is change in notes payable. All variables are calculated during the fiscal year of the IPO and are scaled by average total assets. Sample of 3,960 IPOs with data on all items from Compustat in the fiscal year of the IPO; t-statistics appear in parentheses and are based on standard errors clustered by IPO date.

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively (two tailed).

accruals are abnormal only when IPO-year financials reflect primarily post-IPO activity and that accruals of these firms stem from larger changes in receivables and smaller changes in accounts payable. We argue that smaller changes in accounts payable are consistent with IPO proceeds being used to pay rather than defer (i.e., accrue) expenses and that the large increase in the receivables reflects either firms managing receivables upward *after* the IPO or the IPO raising the visibility of the company's products and consequently increasing credit sales.

5.2.3. IPO-Year Accruals and AAERs. Table 7 presents results from estimating the incidence of accounting fraud in IPO firms as a function of accruals and its components. Column (1) presents results for total accruals, *Accruals*. Results in column (1) suggest IPO-year accruals are unrelated to the incidence of accounting fraud (t-stat of 0.17 on *Accruals*). Column (2) presents results from disaggregating IPO-year accruals into the change in working capital, ΔWC, and other accruals, *Accruals_nonWC*. Consistent with Richardson et al. (2006), column (2) shows that the working capital component is *positively* related to the incidence of accounting fraud (t-stat of 2.15 on ΔWC) but that the nonworking capital component is *unrelated* to the incidence of accounting fraud (t-stat of −0.50 on *Accruals_nonWC*).

Column (3) presents results from disaggregating the working capital component into the change in working capital as a result of the investment of IPO proceeds, $\Delta WC\_Proceeds$, and other changes in working capital, $\Delta WC\_nonProceeds$. We find that the portion of working capital that is attributable to the investment of IPO proceeds is *unrelated* to the incidence of fraud (t-stat of −0.94 on $\Delta WC\_Proceeds$) and that the portion that is not attributable to the investment of IPO proceeds is *positively* related to the incidence of fraud (t-stat of 2.17 on $\Delta WC\_nonProceeds$). The differential relation between these two components of accruals and the incidence of accounting fraud is consistent with the notion that accruals *generated by the investment of IPO proceeds in working capital* are the result of the normal economic activity of newly public companies rather than a symptom of earnings management.

Additionally, whereas our tests of accounting fraud focus on IPO firms, it is also instructive to compare the rate of fraud among IPOs to that in the broader population of public firms. We find that the unconditional probability of an AAER in the sample of IPO firm-years used in our analysis in Table 7 is 0.00433 (t-stat 4.01, $N = 3{,}699$), and the unconditional probability of an AAER in the remaining sample of publicly traded companies in the *pooled accrual sample* is 0.00439 (t-stat 21.42, $N = 104{,}060$). The difference in these probabilities is neither economically nor statistically significant (two-tailed p-value of 0.95). Collectively, the results from our accounting fraud tests are consistent with the notion that, although some IPO firms are undoubtedly engaging in accruals-based earnings management, the practice is not pervasive.

Table 7 SEC Enforcement Actions and Accruals

Variable	(1)	(2)	(3)
Accruals	0.002		
	(0.17)		
Accruals_nonWC		−0.01	−0.01
		(−0.50)	(−0.56)
Δ *WC*		**0.03****	
		(2.15)	
Δ *WC_Proceeds*			−0.05
			(−0.94)
Δ *WC_nonProceeds*			**0.03****
			(2.17)
Control variables			
Δ $AdjRevenue_t$	**0.01****	0.004	0.004
	(2.15)	(1.22)	(1.34)
PPE_t	−0.0003	−0.0002	−0.001
	(−0.07)	(−0.05)	(−0.27)
$CashFlow_{t+1}$	−**0.01***	−**0.01****	−**0.01****
	(−1.90)	(−2.32)	(−2.38)
$CashFlow_t$	−0.001	0.01	0.01
	(−0.13)	(1.02)	(0.83)
$CashFlow_{t-1}$	−0.004	−0.01	−0.01
	(−0.37)	(−0.64)	(−0.87)
Industry and year fixed effects	Yes	Yes	Yes
Adj. R^2	1.73	2.09	2.18
N	3,699	3,699	3,699

Notes. This table presents results from estimating the relation between SEC AAERs and components of accruals in IPO firms:

$$AAER_t = \delta_1 Accruals_t + \boldsymbol{\theta}\, Controls_t + \varepsilon_t,$$

$$AAER_t = \delta_1 Accruals\_nonWC_t + \delta_2 \Delta WC_t + \boldsymbol{\theta}\, Controls_t + \varepsilon_t,$$

$$AAER_t = \delta_1 Accruals\_nonWC_t + \delta_2 \Delta WC\_Proceeds_t + \delta_3 \Delta WC\_nonProceeds_t + \boldsymbol{\theta}\, Controls_t + \varepsilon_t.$$

$AAER_t$ is an indicator variable equal to 1 if an AAER identifies income increasing earnings management at the firm and 0 otherwise. *Accruals_nonWC* is nonworking capital accruals (*Accruals* less ΔWC), ΔWC_t is the change in noncash working capital, Δ *WC_Proceeds* is the change in noncash working capital attributable to the investment of IPO proceeds, $\Delta WC\_nonProceeds$ is the change in noncash working capital not attributable to the investment of IPO proceeds (ΔWC less Δ *WC_Proceeds*), and *Controls* is a vector of control variables including Δ $AdjRevenue_t$, PPE_t, $CashFlow_{t+1}$, $CashFlow_t$, and $CashFlow_{t-1}$. Δ *AdjRevenue* is the change in revenues less the change in net accounts receivables, *PPE* is gross plant, property, and equipment, and *Cash Flow* is cash flow from operations. All independent variables are scaled by average assets, and variables are measured in the year of the IPO. Sample of 3,699 IPOs with requisite data in the fiscal year of the IPO; t-statistics appear in parentheses and are calculated based on standard errors clustered by IPO date.

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively (two tailed).

5.3. Sensitivity Analysis

In addition to the untabulated sensitivity analyses discussed throughout the paper, we conducted three additional sensitivity analyses that we discuss in this section.

5.3.1. Use of Pre-IPO Data. With the exception of the issue price tests reported in Table 2, all of our analyses use accruals from the fiscal year that includes the IPO. Although these are the accruals that prior studies allege are manipulated, it is possible that manipulation instead (or possibly also) occurs in the year or two *prior* to the IPO. Interestingly, however, prior research finds that pre-IPO accruals are significantly negative (Ball and Shivakumar 2008, Venkataraman et al. 2008). Venkataraman et al. (2008) attribute this result to auditors' desire to minimize their legal jeopardy associated with the financials that are reported in the prospectus. In untabulated analysis, we also find that abnormal accruals from all three models are negative (and statistically significant) in the two years preceding the IPO.

The notion that pre-IPO accruals are negative is generally consistent with the results reported in Table 6: IPO-year accruals are reliably negative when IPO-year financial statements report relatively more *pre-IPO* activity, (e.g., when the IPO occurs with between zero and two months remaining in the fiscal year). In addition to examining the magnitude of such accruals, in untabulated analysis, we repeat our tests using pre-IPO accruals and find no evidence of a relation between these accruals and the various outcomes that we examine (i.e., stock returns, insider trades, and AAERs). Taken together, these two findings cast doubt on the notion that accruals in the two years preceding the IPO are managed upwards.[33]

5.3.2. Alternative Incentives. Our incentive tests focus on incentives related to stock price. Although incentives to increase stock price are typically the largest source of incentives for executives of publicly traded companies (e.g., Core et al. 2003), incentives can also come in the form of annual compensation, or "flow pay." In untabulated analysis we estimate total chief executive officer (CEO) compensation in the IPO-year as a function of economic and governance characteristics (firm size, growth options, sales, CEO–chair duality, equity ownership, venture capital backing) and earnings.[34] As with our other incentive tests, we decompose earnings into cash flows and expected and abnormal accruals. Consistent with prior research in the non-IPO setting, we find that earnings are positively related to executive compensation. However, after disaggregating earnings into cash flow and accrual components, across all three accrual models, we find a strong positive relation between cash flows and compensation, but no evidence of a statistically significant relation between either accrual component and compensation.

5.3.3. Alternative Accrual Models. In untabulated analyses we find that the following changes to the accrual models in §4.2 do not affect our inferences: (i) using the balance sheet method to calculate accruals rather than the cash flow method, (ii) scaling by lagged total assets rather than average total assets, (iii) excluding deprecation from the calculation of accruals, and (iv) not subtracting the change in receivables (as in the original Jones 1991 model).

5.4. Discussion

Our results have several implications for prior and future research. Regarding prior research, it is well known that IPO-year accruals correlate with the incidence of litigation (e.g., DuCharme et al. 2004) and with the presence of venture capital and private equity financing (e.g., Morsfield and Tan 2006, Katz 2009). If IPO-year accruals are not due to misreporting, as these papers suggest, then what can explain these results? Although providing an explanation for every result in prior literature exceeds the scope of our study, our analysis suggests to two possible explanations. First, IPO-year abnormal accruals calculated relative to the MJ model reflect the tendency of IPO firms to be small growth firms. Recall that in using the size-age-growth–matched model of accruals (SAG model) we found no evidence that average abnormal IPO-year accruals are different from zero. Consequently, the findings in prior work may simply reflect the unique characteristics of IPO firms compared with publicly traded firms. This seems to be a particularly plausible explanation for results concerning litigation. For example, DuCharme et al. (2004) do not control for firm size or growth in their analysis of the relation between IPO-year accruals and litigation. Second, IPO-year abnormal accruals calculated relative to the MJ model reflect investments in—and therefore the demand for—working capital. Firms with significant cash balances prior to their offering are less likely to have a need for working capital because they can

[33] Another alternative explanation for elevated accruals in the year of the IPO is that management times the IPO to occur *after* a period when growth and accruals are expected to be high (e.g., Pastor et al. 2009). However, this explanation is inconsistent with our finding that firms with IPOs early in their fiscal year tend to have the largest positive accruals. In particular, our results suggest that IPO firms would need to time their IPO just *before* a period of high growth and naturally high accruals (as opposed to after).

[34] We collected data on total CEO compensation from Execucomp (item TDC1). Requiring data on these variables in the year of the IPO reduces our sample to fewer than 1,000 IPO firms.

use cash to finance operating expenses (i.e., they are less cash constrained). This can potentially explain why venture backed and private equity-backed firms, those firm with access to sizable pre-IPO funds, tend to have smaller accruals.

Regarding future research, our study highlights an important identification problem: tests of earnings management based on *any* abnormal accruals model are joint tests of the model of the accruals process and earnings management.[35] Accordingly, estimates of abnormal accruals alone are incapable of discriminating between accruals that are due to earnings management and accruals that reflect normal economic activity. We therefore caution against relying exclusively on the magnitude of abnormal accruals to draw inferences about earnings management. Our study highlights how supplementing tests of the magnitude of abnormal accruals with tests of managerial incentives is one way to help alleviate this "identification problem."

6. Conclusion

Prior studies document large positive abnormal accruals in the year of the IPO and interpret these accruals as evidence of systematic, opportunistic misreporting. We develop two sets of tests to discriminate between the "misreporting" and "economic activity" explanations for these accruals. If, as the prior literature argues, opportunistic misreporting is pervasive in newly public companies, then we expect to find evidence that managers' incentives for misreporting are similarly pervasive. Using several state-of-the-art abnormal accrual models, we test whether managers have incentives to inflate accruals around the IPO to (i) inflate issue price, (ii) inflate post-IPO equity valuation, and (iii) increase their insider trading profits. Across all tests, we find no evidence of a positive relation between accruals and these outcomes. These results are inconsistent with the notion that managers have systematic incentives to inflate accruals around the IPO.

Next, we examine the economic activity explanation for the large positive abnormal accruals in the year of the IPO: specifically, we examine whether IPO-year accruals are an artifact of newly public companies investing their IPO proceeds in working capital. Consistent with the investment of IPO proceeds in working capital during the same fiscal year as the IPO, we find no evidence of abnormal IPO-year accruals after controlling for IPO proceeds. Moreover, we find that the relation between IPO proceeds and IPO-year accruals is strongest when the IPO-year financial statements reflect six or more months of post-IPO activity and that IPO-year accruals are abnormally large *only* for those firms where the IPO-year financial statement reflects six or more months of post-IPO activity. In subsequent analysis, we find that the abnormal accruals of these firms are entirely attributable to large changes in working capital.

Finally, we show that controlling for the IPO proceeds invested in working capital produces a measure of abnormal accruals that is more powerful for detecting accounting fraud. Specifically, we find that the portion of accruals that is attributable (not attributable) to the investment of IPO proceeds in working capital is unrelated (positively related) to the incidence of accounting fraud. These findings are consistent with the notion that controlling for investment of IPO proceeds in working capital removes an important source of bias. We interpret our collective evidence as suggesting that the accruals of newly public companies are not the result of *systematic* opportunistic misreporting and that the financial reporting quality of newly public companies is considerably higher than is widely alleged.

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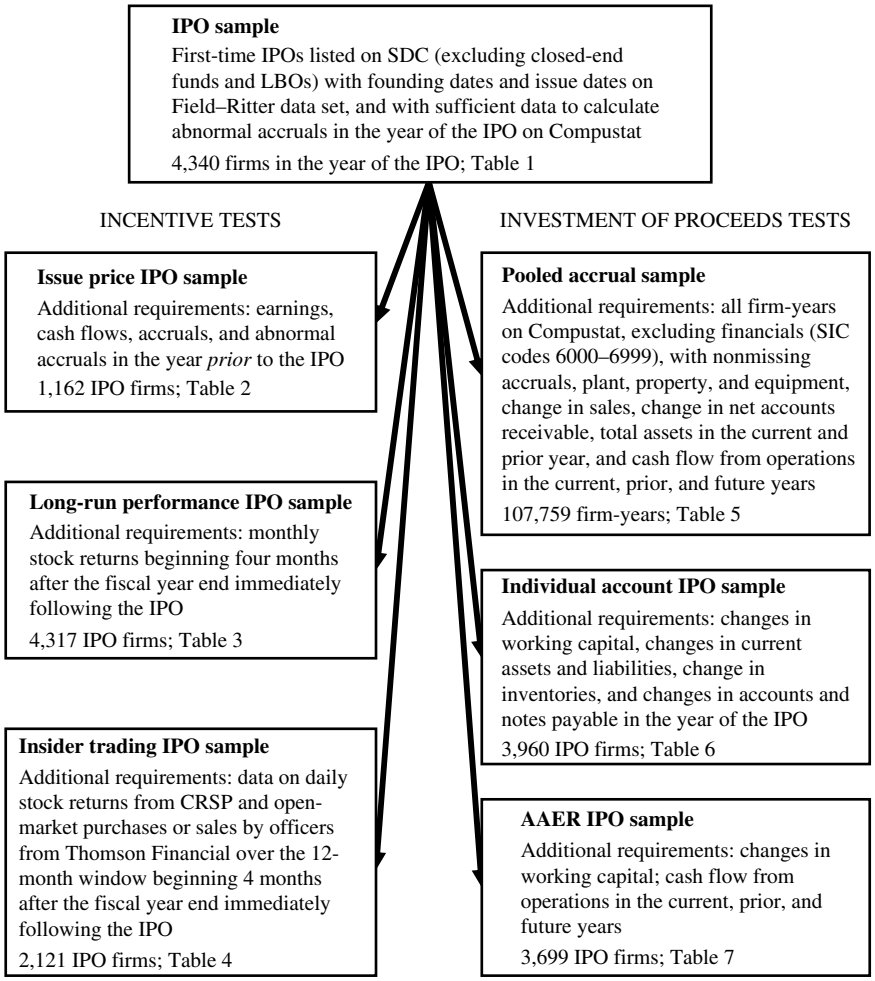
Appendix. Sample Formation

We compile a list of all first-time initial public offerings in the United States from SDC and exclude close-end funds and LBOs. Of these, 6,160 first appear on CRSP and the Field–Ritter data set within one month of the trade date listed by SDC. Requiring sufficient data on Compustat to calculate abnormal accruals in the year of the IPO and excluding financial firms (SIC codes 6000–6999) results in a final sample of 4,340 companies (*IPO Sample*). We then impose additional requirements for each set of tests. In Figure A1 we detail the additional requirements for each test, the resulting sample size, and the table in which each test appears.

[35] This point is analogous to the one made in the asset pricing literature that any test of market efficiency is a joint test of both market efficiency and the benchmark asset pricing model.

Figure A.1 Sample Formation



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