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Earnings Management to Avoid Delisting from a Stock Market

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Abstract:
We show that firms 'in danger' of being delisted from a stock market (NASDAQ) report higher performance-adjusted discretionary accruals and the inflated accruals are associated with an increased likelihood of maintained listing. Accruals of firms 'in danger' are less positive in fiscal quarters audited by a Big-4 auditor and after the implementation of SOX. In contrast, accruals are higher for firms that benefit most from public listing and for firms with good future prospects. This suggests that managers consider reputation and litigation risk associated with earnings management and they manage earnings only when they believe the firm will recover in near future. The market can thus interpret discretionary accruals as a signal revealing managers' private information about firm quality. Consistent with the signaling explanation we observe a stronger stock price reaction on the announcement of earnings that contain large accruals in threatened firms.

Keywords: Delisting, earnings management, discretionary accruals, insider trading, reverse stock split, audit, Sarbanes-Oxley Act
JEL: G34, M41, M42, M48

1. Introduction

Initial listing of a firm in a stock market (IPO) is often celebrated as a milestone in a firm's history. Public listing helps a firm access a broader investor base, increase liquidity of its stocks and facilitate risk sharing. In addition, public firms pre-commit to higher degree of transparency, which decreases the information risk investors bear (Leuz and Verrecchia 2000). Public listing thus tends to reduce the cost of equity capital (Jenkinson and Ljungqvist 2001) and indirectly also the cost of debt (Saunders and Steffen 2011). Furthermore, public firms are more visible to the business community, they are more likely to benefit from becoming a takeover target (Zingales 1995) and to succeed both as buyers and sellers in merger waves (Maksimovic et al. 2013). Prior research shows that larger, well performing firms with a significant growth potential are likely to benefit most from a public listing (Kim and Weisbach 2008; Pagano et al. 1998).

When a stock exchange decides to delist a firm due to non-compliance with maintained listing requirements it deprives the firm from these listing benefits. The National Association of Securities Dealers Automated Quotations (NASDAQ) requires firms to meet several criteria including a requirement to maintain a firm's stock price above one dollar. Macey et al. (2008) report about one half of delistings from NASDAQ are initiated by the stock exchange or the market regulator and the violation of the minimum bid price criterion is the most common reason for involuntary delisting. Past research shows that involuntary delisting is associated with significant economic costs that include a sharp decline in stock price, increased stock return volatility, increased bid-ask spreads and for some firms also a decrease in trading volume (Baker and Meeks 1991; Macey et al. 2008; Sanger and Peterson 1990; Shumway 1997). Macey et al. (2008) describe involuntary delisting as 'traumatic events' affecting adversely both the

delisted firms and their investors.

Given these adverse consequences firms 'in danger' of involuntary delisting are likely to have incentives to avert it. In this paper we investigate whether firms in violation of the minimum bid price requirement manage earnings to boost their stock price and improve their chances to maintain their NASDAQ listing. Past research shows that stock prices react on announced earnings as investors update their expectations about a firm's future profitability (Collins and Kothari 1989; Easton and Zmijewski 1989; Kormendi and Lipe 1987; Kothari and Sloan 1992; Miller and Rock 1985). The magnitude of this reaction increases with investors' uncertainty about a firm's future prospects (Lang 1991), which is likely to be high for troubled companies. Thus reporting higher earnings may help firms 'in danger' increase their stock price and restore compliance with the minimum bid price requirement.

On the other hand, firms 'in danger' may be reluctant to manage earnings for a number of reasons. First, the stock exchange is a sophisticated player with considerable discretion in making the delisting decision. Past research shows that sophisticated market participants can 'see through' opportunistic accounting and discount reported numbers (Coles et al. 2006). Thus managers may be skeptical about earnings management effectiveness. Second, by construction accruals reverse over time and so *ceteris paribus* reporting higher accruals today implies lower accruals in the future. Hence, managers may consider accrual management unattractive as it offers only a temporary solution to their problem. Third, opportunistic interference in the accounting process involves reputation and litigation costs to the firm's management (Cohen and Zarowin 2010; DeAngelo et al. 1994; Dechow et al. 1996; DuCharme et al. 2004). This cost should be particularly relevant after the implementation of SOX (Coates 2007; Cohen et al. 2008; Daniel et al. 2008; Iliev 2010). Thus, it is interesting to investigate whether firms

threatened with delisting manage accruals and how their activity trades off the benefits and costs of earnings management.

We find that after controlling for performance firms 'in danger' of being delisted have significantly positive discretionary accruals (*DACC*). This result holds both when we use return on assets (*ROA*) as a control for performance and when we measure *DACC* relative to non-threatened firms matched on performance (Kothari et al. 2005). We suggest that the documented *DACC* reflect a firm's deliberate intention to artificially improve performance. Therefore we expect *DACC* to be sensitive to the benefits of public listing and to the costs of earnings management. To measure the benefits firms derive from public listing we construct a listing benefit index (*L-Index*) by aggregating normalized values of seven factors identified in prior literature to reflect listing benefits. Examining external validity of *L-Index* we observe that (i) it is positively associated with reverse stock splits (RSS) that companies can implement as an alternative strategy to avert delisting and that (ii) firms with higher *L-Index* have greater likelihood to maintain their listing. We find that firms 'in danger' with higher *L-Index* report more positive *DACC*, which suggests that firms that benefit most from public listing and hence have strongest incentives to protect it manage earnings more aggressively.

Furthermore, we analyze the sensitivity of reported *DACC* to the cost of earnings management. We argue that (i) high quality audit and (ii) restrictive accounting regulation increase the cost of earnings management. Consistent with past research we use auditor size as a proxy for audit quality due to the higher reputation and litigation/insurance costs large auditors face (Skinner and Srinivasan 2012; e. g. Weber et al. 2008). We show that *DACC* are lower for firms 'in danger' reporting earnings in the fourth fiscal quarter audited by a Big-4 auditor. The Sarbanes Oxley Act (SOX) ratcheted up requirements for internal control mechanisms and introduced

legal penalty to the management, both of which significantly increased the cost of accounting manipulation (Cohen et al. 2008; Iliev 2010). We show that managers of firms 'in danger' inflate *DACC* less after the implementation of SOX.

We consider two alternative explanations for our findings. First, if the perceived costs of earnings management are negligible we expect managers to indiscriminately 'try their luck' in boosting the stock price by inflating earnings. Under this scenario inflated *DACC* would reflect a mere attempt to mislead the market about the true performance of the company (*the deception explanation*). Alternatively, managers perhaps consider earnings management potentially costly and trade off case-specific benefits against these costs when deciding whether (and how intensively) to manage earnings. We expect the cost of earnings management to be decreasing in the likelihood of a firm's recovery (see below for details) and so we expect that managers who anticipate a performance improvement are more likely to inflate earnings if they. Under this scenario investors can rationally interpret inflated accruals as a signal of favorable private information managers have about their firm's quality (*the signaling explanation*).

To discriminate between the two explanations we examine whether the intensity of earnings management is affected by firm-specific costs related to firm quality and managerial optimism. We use the incidence of insider stock purchases preceding the delisting threat as a proxy for managerial optimism and we show that managers are more likely to inflate *DACC* when their purchases indicate that they are confident about the company's future. We also show that 'at risk' firms that report high *DACC* exhibit *ex post* higher quality that we measure by the ability to maintain their listing, and conditional on continued listing by accounting profitability, stock returns and likelihood of insider purchases. Consistent with the signaling explanation these results suggest that the costs of earnings management matter, and that managers in firms with

better prospects are more willing to take personal risk and manage *DACC* upwards more aggressively.

Finally, we investigate if the stock market consider *DACC* reported by firms 'in danger' informative. We measure firms' earnings response coefficients (ERC) and in line with prior research we show that absent the delisting threat stock price reacts positively to unexpected earnings and the reaction is attenuated when the reported earnings comprise large discretionary accruals. In contrast, for the firms 'in danger' the strength of the price reaction on earnings news is positively associated with reported *DACC*. Thus, consistent with the signaling explanation investors consider earnings reported by firms 'in danger' more informative when they contain large discretionary accruals.

Our paper is related to Belski (2004) and Yang (2006) who also investigate earnings management in firms facing threat of delisting. However, our conclusions differ. Belski (2004) uses a shorter sample period between 1997 and 2001, he does not require the stock price to be below one dollar for 30 days to classify a firm to be 'in danger' and crucially he does not control for performance when computing abnormal accruals. He observes significantly negative abnormal accruals for firms 'in danger' and concludes that they seem to reflect financial difficulties of threatened firms rather than earnings management. Yang (2006) uses annual rather than quarterly data from 1992 to 2002 and she applies a seemingly arbitrary criterion for the delisting danger of the stock price below 1.50 dollars for 40 consecutive trading days. She documents positive performance-adjusted discretionary accruals for firms that can *ex post* be identified as not performing an RSS and not delisting. We extend Yang (2006) by documenting positive performance-adjusted *DACC* in quarterly data for all firms violating the listing requirement as specified by NASDAQ. We also demonstrate the moderating effect of audit

quality as a direct measure of earnings management cost, we establish a direct link to an *ex ante* measure of managerial optimism based on insider purchases and we document characteristics of a stock price reaction on earnings announcements consistent with the signaling explanation.

We contribute to other existing literatures in several ways. First, we contribute to the corporate finance discussion on the choice of public listing by showing that firms have strong preferences over their equity trading venue, they are willing to bear costs to defend the listing of their choice, and the intensity of this activity is increasing in firm-specific listing benefits. Second, we contribute to financial accounting discussion on drawbacks and merits of earnings management by showing that in our setting the decision to inflate accruals reveals insiders' expectations to the market. Macey et al. (2008) argue that the "*current [delisting] rules are antiquated, forcing exchanges to remove firms for violating strictures of dubious modern-day value"* (p. 685). While acknowledging the limitations of the delisting rules we document one of their benefits – they make firms 'in danger' disclose their quality – that can be helpful to the stock exchanges in making their delisting decision. Third, we also contribute to the audit literature by providing additional evidence that high quality audit by a Big-4 auditor limits a firm's possibilities for 'non-neutral' application of accounting rules, and by documenting a similar effect for SOX.

2. Literature

A firm can benefit from listing its equity at a public stock exchange in a number of ways (Brau and Fawcett 2006). Lower transaction costs make the stock accessible to a larger pool of investors leading to effective risk sharing, more efficient pricing and increased stock liquidity. Public firms also subject themselves to significant regulatory scrutiny and they pre-commit to extensive periodic disclosure, which serves as a bonding mechanism that reduces information

risk (Diamond and Verrecchia 1991; Leuz and Verrecchia 2000). Lower liquidity and information risk imply a lower cost of a firm's equity. Furthermore, Pagano et al. (1998), Schenone (2010), and Saunders and Steffen (2011) show that the higher transparency associated with public listing also reduces a firm's cost of debt. Better visibility of public firms together with the higher stock liquidity also helps the initial owner sell the company profitably (Zingales 1995) and it helps them succeed as buyers and sellers in merger waves (Maksimovic et al. 2013).

Listing cost and benefits vary across trading venues and past research shows that firms trade these off when finding the most suitable market. Cowan et al. (1992), Christie and Huang (1994), Clyde et al. (1997), and Tse and Devos (2004) investigate firms that switch between markets and conclude that they have characteristics (quoted spreads, number of shareholders, and number of market makers) that suggest that they will benefit from the switch. Bushee and Leuz (2005) examine the introduction of new disclosure criteria in OTC BB between 1999 and 2000 and show that institutional changes that alter the cost-benefit trade-off affect a firm's listing choice and incentivize many firms to leave the market.

Consistent with the relevance of a firm's listing choice past research documents a positive stock price reaction on OTC firms' announcements to list at a premium market (e. g. Ying et al. 1977). The price reaction is more positive for initially less liquid stocks that likely benefit most from a switch to NYSE (Grammatikos and Papaioannou 1986) or to AMEX (Baker and Edelman 1991). The price reaction turned less positive after the introduction of a more efficient communication system in the OTC market that reduced the relative advantage of NYSE (Sanger and McConnell 1986). The price reaction could conceivably be favorable because the decision to 'upgrade' to a premium stock market conveys a positive signal about insiders' confidence in

the firm's prospects and a commitment to higher transparency. However, Clyde et al. (1997) and Tse and Devos (2004) document a positive stock price reaction even for firms that announce a voluntary listing 'downgrade' from AMEX to NASDAQ even though their bid-ask spreads approximately double after the switch. Hence, the positive price reaction to both 'upgrades' and 'downgrades' likely reflects expected cost savings (lower cost of equity after 'upgrades' and savings on compliance costs after 'downgrades') resulting from realizing a firm's move to a more suitable trading venue.

Not all changes of a trading venue reflect a deliberate choice of the company. Stock exchanges specify a set of criteria that firms shall meet to maintain their listing. These criteria are intended to ensure that the relationship between the stock exchange and the firm remains profitable and to protect the stock exchange's reputational capital (Macey et al. 2008). If a firm fails to comply with the criteria a stock exchange can terminate their listing. Prior research shows that about one half of NADSAQ delistings are involuntary, i.e. they are initiated by the stock exchange or (less frequently) by the stock market regulator (Macey et al. 2008; Sanger and Peterson 1990). Macey et al. (2008) describe involuntary delistings as 'traumatic events' adversely affecting both the delisted firms and their investors. Economic costs associated with delisting include a significant decline in the stock price, increased stock return volatility, increased bid-ask spreads and for some firms also a decrease in trading volume (Baker and Meeks 1991; Harris et al. 2008; Macey et al. 2008; Sanger and Peterson 1990; Shumway 1997; Shumway and Warther 1999). In addition, managers may also be concerned that delisting may threaten their career prospects and that it may trigger an outside intervention from the board of directors or active owners. Hence, we expect firms threatened to be barred from their preferred stock exchange to consider involuntary delisting undesirable and to have incentives to avoid it.

Inflating earnings can plausibly increase a firm's chances to avert delisting. One of the criteria required by NASDAQ for maintained listing stipulates the stock price to remain above one dollar. If a firm's closing bid price is below one dollar for 30 consecutive trading days NASDAQ considers a company non-compliant with the minimum price requirement and it gives the firm 180 days to remedy the situation. During these 180 days a firm makes two quarterly earnings announcements that may affect market perception of the firm's expected profitability. Past research shows that stock prices react on the level of announced earnings as investors update their expectations about a firm's future profitability (Collins and Kothari 1989; Easton and Zmijewski 1989; Kothari and Sloan 1992). The strength of this reaction increases with investors' uncertainty about the future prospects of the firm (Lang 1991), which is likely to be high for a troubled company. The upward price revision following high earnings announcement may help the firm bring the stock price back above the one dollar threshold.

Prior research provides some evidence that troubled firms manage earnings to avert undesirable outcomes. Commercial banks tend to adjust their accounting when their primary capital adequacy ratio declines relative to its regulatory minimum (Moyer 1990). Similarly, managers of property-casualty insurers that are financially weak and especially those that are 'close' to receiving regulatory attention bias downward their estimates of claim loss reserves, which improves their reported income (Petroni 1992). Firms change accounting policies to avoid violating accounting-based debt covenants (Sweeney 1994), they report positive abnormal accruals in the year preceding the covenant violation (DeFond and Jiambalvo 1994), and they are more (less) likely to report earnings that are just above (below) the covenant threshold (Dichev and Skinner 2002). Firms also seem to increase earnings by reporting positive discretionary accruals prior to filing for bankruptcy (Leach and Newsom 2007).

On the other hand, not all trouble leads to earnings management. Healy and Palepu (1990) and DeAngelo et al. (1994) show that loss-making firms cut dividend instead of inflating accruals to circumvent dividend covenant restrictions. Personal litigation and reputation cost may deter the management from manipulating accruals (Cohen et al. 2008; Cohen and Zarowin 2010; DeAngelo et al. 1994). Also auditors face a higher litigation risk if the audited firm is in poor financial condition and hence they are likely to closely monitor managers' accounting choices and insist on conservative accounting practices (Stice 1991). Furthermore, managers may doubt the effectiveness of earnings management. Coles et al. (2006) examine price response on earnings reported around cancellation and subsequent reissue of executive stock options and they show that investors and analysts 'see through' earnings management when managerial incentives to manipulate earnings are apparent *ex ante*. Thus, the question on whether firms 'in danger' of being delisted manage their earnings to avoid involuntary delisting is interesting to investigate.

Hypothesis 1: *Firms 'in danger' of being delisted have on average higher performance-adjusted discretionary accruals.*

If the documented *DACC* reflect management's purposeful use of accounting discretion to boost earnings we expect the magnitude of *DACC* to be sensitive to the costs and benefits of earnings management. Past research suggests that benefits of public listing vary across firms (Kashefi Pour and Lasfer 2013; Mehran and Peristiani 2010). We expect that firms that benefit more from their presence at a public stock market have stronger incentives to manage earnings to avert their delisting. We search existing literature for proxies of listing benefits and the construct an index of listing benefits (*L-Index*) that captures how important it is for a company to be listed on a stock exchange. The index is based on seven measures that reflect future needs

of equity financing (book-to-market equity ratio, research and development ratio, capital expenditure ratio, financial leverage ratio) and the degree of financial visibility or investor interest a firm managed to achieve (stock turnover, analyst coverage, institutional ownership).

To support the external validity of *L-Index* we examine how it is related to the likelihood a firm 'in danger' performs a reverse stock split (RSS) that mechanically increases the stock price and thus can be viewed as an alternative strategy to avert delisting. Relative to earnings management RSS depends less on how investors interpret information provided by the firm. Nevertheless, prior literature documents significant costs associated with making RSS. Even though RSS typically succeed in increasing stock liquidity (Han 1995) they reflect management's pessimism about a firm's ability to reach attractive stock price levels and their announcement is associated with a negative stock price reaction that is especially large for small firms (Peterson and Peterson 1992). This implies that the decision on whether or not to make an RSS also reflects the trade-off between the costs and benefits. We argue that a positive association between *L-Index* and the likelihood of RSS suggests that the index captures well firms' listing benefits and their incentives to take action to avert it. We then use the index as a proxy for listing benefits and we investigate whether firms 'in danger' with greater listing benefits report higher performance-adjusted *DACC*.

Hypothesis 2A: *Performance-adjusted discretionary accruals (DACC) reported by firms 'in danger' of being delisted are more positive for firms with higher listing benefits.*

We further analyze factors affecting the cost of earnings management. We suggest that higher quality audit increases the cost by constraining opportunistic application of accounting discretion in the accounting process. Existing research argues that large auditors face higher reputation ('more to lose') and litigation/insurance ('deep pockets') costs that motivate them to

maintain high quality of their audit (DeAngelo 1981; Dye 1993; Khurana and Raman 2004; Lennox 1999; Skinner and Srinivasan 2012; Weber et al. 2008; Willenborg 1999). Consistent with this argument big auditors are more likely to challenge their clients' accounting choices (DeFond and Jiambalvo 1991). Clients of big auditors are less likely to inflate earnings by income-increasing *DACC* (Becker et al. 1998), they are less likely to issue accounting restatements (Eshleman and Guo 2014), and they have higher earnings response coefficients (*ERC*), which implies that the market perceives their earnings announcements as more credible (Teoh and Wong 1993). Thus, following prior literature we use the Big-4 auditor dummy as a proxy for high audit quality (Becker et al. 1998; e. g. Behn et al. 2008) and we examine if performance-adjusted *DACC* reported by firms 'in danger' are lower when reported in the fourth quarter audited by a Big-4 auditor.

Furthermore, we suggest that SOX increased the cost of earnings management by imposing further constraints on the accounting production process and by introducing additional legal penalties for fraudulent accounting (Coates 2007). Prior research shows that after the implementation of SOX accounting is on average more conservative, firms report lower total and discretionary accruals (Iliev 2010), and they use less accrual-based earnings management to meet performance targets (Cohen et al. 2008) and to meet expected dividend thresholds (Daniel et al. 2008). SOX has also increased the cost of audit failure, which improved the quality of audit provided by the Big-4 auditors (Carcello et al. 2011) and incentivized lower quality auditors to leave the market (DeFond and Lennox 2011). Taken together, we assume that SOX increased the cost of earnings management and we expect that firms 'in danger' to have less

positive performance-adjusted *DACC* after its implementation.[3]

Hypothesis 2B: *Performance-adjusted discretionary accruals (DACC) reported by firms 'in danger' of being delisted are less positive when the cost of earnings management is high.*

We consider two alternative explanations for our findings – *deception* and *signaling*. To distinguish between the two explanations we investigate how reported *DACC* are related to managerial expectations of future performance and to firm quality. We argue that if managers perceive the reputation and litigation costs of earnings management negligible they have little reason for not 'trying their luck' and inflating earnings. Under this scenario inflated *DACC* would not be informative about the underlying firm characteristics and they would simply reflect an opportunistic use of accounting discretion to mislead the market about the true performance of the company (*deception explanation*). In that case reported *DACC* should not be affected by shocks to the institutional framework that alter the cost of earnings management.

On the contrary, if managers consider the cost potentially significant they will use earnings management selectively and manage *DACC* more aggressively when they perceive the cost lower. We expect the perceived costs to be decreasing in the likelihood of a firm's recovery. If a firm inflates *DACC* when its outlook is bleak it may fail to compensate for the future accrual reversal and the poor reported performance may trigger shareholder action against the management on the grounds that they initially misinformed investors. On the other hand, we

[3] Note that another complementary interpretation of SOX is that it increased costs of listing and thereby *ceteris paribus* decreased firms' incentives to avert delisting (see the discussion on benefits and costs below). Both perspectives give similar predictions for the magnitude of *DACC*.

expect managers to be more willing to inflate earnings when they expect a recovery sufficient to attenuate the effect of future accrual reversal. If so the market can interpret inflated *DACC* as a signal conveying inside information about the managers' perceived likelihood of a firm's recovery (*signaling explanation*).

Furthermore, we investigate how the reported *DACC* vary with the managerial expectations of firm performance. We expect managers to consider earnings management more costly when they are skeptical about future firm performance. If the firm does not recover in the near future the poor performance magnified by the accrual reversal exposes the firm's weaknesses in full. In such a case dissatisfied shareholders may argue that by inflating *DACC* in the past quarters managers disguised the true state of the company and prevented the owners from taking appropriate measures to remedy the situation. On the other hand, the owners are much less likely to act against the management in case the company recovers and the improved performance compensates for the accrual reversal. Hence, we expect managers to be more willing to take the litigation and reputation risk and inflate accruals when they anticipate an improvement in their firm performance.

We use insider purchases in two quarters preceding the danger of delisting as a proxy for managers' subjective assessment of their firm's prospects. Past research shows that insiders are ready to make contrarian trades if they disagree with the prevailing market perception of the firm value (Jenter 2005; Rozeff and Zaman 1998). Past research also shows that unlike sales that may be driven by liquidity and/or rebalancing needs, insider purchases are typically informative about insiders' perception of their firm's future (Lakonishok and Lee 2001). We argue that if managers purchase their own company stocks they place their own money on the belief that the company will perform well in the future. We thus expect *DACC* of firms 'in

danger' to be higher in firms where management purchased stocks because the good performance expected in the future reduces the reputation and litigation cost of earnings management.

Hypothesis 3A: *Performance-adjusted discretionary accruals (DACC) reported by firms 'in danger' of being delisted are more positive when managers purchase stocks ex ante.*

We further examine how are the reported *DACC* related to firm quality. Given the superior information managers have about the future prospects of their company we expect insider purchases to be indicative of their firm's quality. Nevertheless, to further support the argument that earnings management is used selectively by the stronger players we use three *ex post* measures to see if the firms 'in danger' that strongly mange *DACC* do better afterwards. First, we examine the 'survival' of firms as publicly traded on the stock market three years after the delisting threat. We argue that the stronger players are more likely to avert delisting. Second, conditional on the firm's survival on the stock market we analyze market-adjusted stock returns over one year following the delisting danger. Given that a switch of a listing venue tends to have an impact on stock returns in these tests we only include firms that maintained their listing three years after the delisting threat. We expect the strong players to have better stock returns reflecting the gradual revelation of their quality to the market. Finally, we investigate insider purchases in the year following the delisting danger. We argue that the insider purchases indicate managers' confidence in longer-term future and so we expect insiders to be more likely to purchase stocks in high quality rather than low quality firms. In all cases we expect performance-adjusted *DACC* for firms 'in danger' to be higher for firms that *ex post* exhibit higher quality measured by their survival in the stock market, their stock returns and the incidence of insider purchases.

Hypothesis 3B: *Performance-adjusted discretionary accruals (DACC) reported by firms 'in danger' of being delisted are more positive in firms of higher quality revealed ex post.*

Research on earnings response coefficients (ERC) examines whether earnings announcements contain information relevant for equity valuation and what characteristics affect the information content of reported earnings. Past studies conclude that in general earnings announcements are informative and the magnitude of corresponding stock price revision depends on the (i) predictive ability of earnings innovations and on (ii) their credibility. Price reaction induced by earnings announcements is stronger when earnings innovations are more persistent (Kormendi and Lipe 1987) and it is weaker for reported losses (Hayn 1995), consistent with accounting losses being less persistent than profits and hence less informative about a firm's future prospects. At the same time, ERCs are higher for earnings audited by large auditors (Teoh and Wong 1993), by industry specialist auditor (Balsam et al. 2003), or by auditors with a longer tenure (Ghosh and Moon 2005) all of which are proxies for audit quality which lends credibility to reported accounting.

We examine how unexpected earnings and abnormal accruals affect price reaction on earnings announcements and how the relationship is affected by the delisting 'danger'. Past research suggests that accruals (Sloan 1996) and discretionary accruals in particular (Xie 2001) are negatively associated with earnings persistence. Thus in a 'normal' situation we thus expect positive stock price reaction on earnings surprises to be attenuated by abnormal accruals. We expect this effect to be different for firms 'in danger' though. They likely undergo restructuring and so their earnings surprises should be less informative about the future and so they should induce a weaker price reaction. More importantly, we argue that (in contrast to a 'normal' situation) it is risky to inflate accruals in troubled firms and so the management does so only if

they are confident about the firm's future. This makes abnormal accruals reported by firms 'in danger' informative about the insiders' expectations and so we expect stronger stock price reactions on earnings that contain high abnormal accruals.

Hypothesis 4: *Stock price reaction on earnings reported by firms 'in danger' is stronger if they contain higher performance-adjusted discretionary accruals (DACC).*

3. Design

3.1. Methodology

Stock exchanges specify a set of requirements that firms shall meet to maintain their listing. These requirements are intended to ensure that the relationship between the stock exchange and the firm remains profitable and to protect the stock exchange's reputational capital (Macey et al. 2008). NASDAQ requirements for maintained listing include a minimum number of shareholders, a minimum number of publicly held shares, a minimum market capitalization of publicly held shares, a minimum company size measured by total assets, total revenues, shareholders' equity or market capitalization, and also a minimum bid price[4] (Harris et al. 2008). If a company violates these requirements NASDAQ notifies the company and demands a correction within the 'remedy period' of 180 days. NASDAQ can exercise discretion in prolonging the 'remedy period' and in enforcing the actual delisting. The company may also

[4] An overview of continued listing criteria is available online in the NASDAQ Continued Listing Guide, https://listingcenter.nasdaqomx.com/assets/continuedguide.pdf

request a hearing to present its plan to regain compliance before the Listing Qualifications Panel that can decide to maintain the company's listing. As the specific application of this discretion is hard to predict and systematize, we assume that a company's response (if any) to the delisting threat takes place in 180 days following the reception of the notification letter from NASDAQ.

We define a firm to be 'in danger' of being delisted if it violates the minimum bid price requirement. Violation of the minimum bid price requirement is the most common cause of involuntary delisting (Macey et al. 2008). NASDAQ considers a company non-compliant with the minimum price requirement if its daily closing bid price is below one dollar for 30 consecutive trading days. We refer to the day following the 30 trading days of stock price below one dollar as 'time zero'. After 'time zero' NASDAQ sends a notification letter to the company and grants it 180 days during which the company should restore compliance. We refer to these 180 days as the 'remedy period'. In order to restore compliance a firm must maintain the closing bid price above one dollar for a minimum of 10 consecutive trading days. We define an indicator variable *Danger* that is equal to one if a firm in the current quarter violated the minimum bid price requirement for the first time of its sample history and zero otherwise.

We measure the magnitude of earnings management by scaled discretionary (abnormal) accruals (*DACC*). Consistent with prior research we argue that accruals are easier to manage than cash flows (especially at a short notice) and so if firms 'in danger' try to artificially improve earnings we expect *DACC* to reflect it. We use the statement of cash flow approach to compute total accruals (*TACC*) (Collins and Hribar 2000):

$$TACC_{it} = (EARN_{it} - CFO_{it}) \quad (1)$$

where $TACC_{it}$ are the total accruals for a firm i at the end of quarter t, $EARN_{it}$ is the net income

before extraordinary items and discontinued operations (Compustat item 'ibq'), and CFO_{it} is the cash flow from operations obtained directly from the statement of cash flow (Compustat item 'cfoq').

We measure *DACC* as the residuals from the modified Jones model (Jones 1991; Dechow et al. 1995). The model expresses *TACC* as a function of gross property, plant and equipment (*PPE*) as a source of depreciation, and the change in total revenues adjusted for the change in accounts receivable that determine the normal level of working capital accruals. The adjustment for the for change in accounts receivable follows Dechow et al. (1995) who argue that due to the managerial discretion in timing revenue recognition the entire change in accounts receivable should be treated as if it resulted from earnings management. In line with prior research we scale all variables with average total assets to reduce the heteroscedasticity of residuals. Our first-stage regression thus has the following form:

$$\frac{TACC_{it}}{avgA_{it}} = \beta_0 \frac{1}{avgA_{it}} + \beta_1 \frac{(\Delta REV_{it} - \Delta REC_{it})}{avgA_{it}} + \beta_2 \frac{PPE_{it}}{avgA_{it}} \quad (2)$$

where $TACC_{it}$ are the total accruals for a firm *i* at the end of quarter *t*, ΔREV_{it} is the change in total revenues for a firm *i* between quarter *t*-1 and *t*, ΔREC_{it} is the change in accounts receivable for a firm *i* between quarter *t*-1 and *t*, PPE_{it} is the gross property plant and equipment of a firm *i* at the end of quarter *t*, $avgA_{it}$ are average total assets for a firm *i* from the beginning and end of the quarter *t*. To mitigate the effect of outliers we Winsorize all variables at 1 per cent level.

We estimate model (2) for each industry-quarter. We use Fama and French classification of firms to 49 industries. We exclude financial firms (SIC codes 6000–6799) and utility firms (SIC codes 4900 - 4999) because the structure of their assets and corresponding accruals differ dramatically from other industries. To control for possible heterogeneity among four fiscal

quarters we group together firms with (i) in a given fiscal quarter (first, second, third or fourth) and (ii) an identical fiscal year end date. Following Cohen and Zarowin (2010) and we require at least 8 observations in each combination of industry, fiscal quarter and fiscal year end date to make the estimation meaningful.

Prior research shows that *DACC* are highly dependent on firm performance (Kothari et al. 2005). As performance of firms 'in danger' tends to be poor (after all, it is the poor performance that is typically the underlying reason for the threat of delisting) it is crucial to adjust for firm performance. We do it in two ways. First, we include return on assets (*ROA*) as a control variable in the second stage regressions that regress *DACC* on *Danger* (see below for details). We define ROA_{it} for a firm *i* as the income before extraordinary items of a quarter *t* ($EARN_{it}$) divided by average total assets in the beginning and at the end of quarter *t* ($avgA_{it}$). Second, following Kothari *et al.* (2005) for every firm 'in danger' we identify a matching firm from the same industry, quarter, and fiscal year end date that has not experienced the threat of delisting and that has the closest *ROA*. We compute performance-matched discretionary accruals (*pmDACC*) as the difference between *DACC* of the firm 'in danger' and the matching firm.

In the second stage we regress *DACC* estimated at the first stage on the variable of our interest (*Danger*), a set of conditioning variables, and a set of control variables.

$$DACC_{it} = \beta_0 + \beta_1 Danger_{it} + \sum_{j=2}^{m} \beta_j CTRL_{jit} + \sum_{k=m+1}^{n} \beta_m COND_{mit} + \sum_{l=n+1}^{p} \beta_l Danger_{it} \cdot COND_{mit} \quad (3)$$

where $DACC_{it}$ are the discretionary accruals or performance-adjusted discretionary accruals for a firm *i* at the end of quarter *t*, $Danger_{it}$ is a dummy variable equal to one if a firm is in the current quarter 'in danger' of being delisted (see below for details) and zero otherwise, $CTRL_{jit}$

is a control variable *j*, and $COND_{mit}$ are a conditioning variable *m*. We consider a firm to be 'in danger' if it violated the minimum bid price requirement in the current quarter for the first time in its sample history (i.e. it had its closing bid price below one dollar for 30 consecutive trading days). We do not consider a firm to be 'in danger' if it encountered 'time zero' in one of two extraordinary periods during which the minimum bid price requirement was temporarily suspended, i.e. after the attack on the World Trade Centre (September 27, 2001 to January 2, 2002), and during the turmoil leading up the global financial crisis (October 16, 2008 to August 3, 2009). Besides *ROA* we include company size measured as the natural logarithm of net sales lagged by one quarter ($LnSales_{q-1}$). Again we Winsorize all continuous variables at 1 per cent level to mitigate the effect of outliers.

We use a number of conditioning variables that are expected to influence the intensity of earnings management of firms 'in danger'. We construct a listing incentive index (*L-Index*) by adding up normalized values of seven factors identified in prior literature to reflect benefits a firm derives from public listing. Companies list at a stock market to obtain access to liquid equity financing of their investment (Bharath and Dittmar 2010). Such access is important especially for firms that have made or are expected to make significant investments. We thus expect firms with high capital expenditures (*Capex*), research and development expenditures (*R&D*), and firms that expect growth captured by the market-to-book equity ratio (*ME/BE*) to have stronger incentives to retain their listing (Bharath and Dittmar 2010; e. g. Pagano et al. 1998). Mehran and Peristiani (2010) argue that these measures also reflect managerial opportunity to waste company resources by investing to negative net present value projects. The richer disclosure associated with public listing may be seen as a bonding mechanism through which the management pre-commits to refrain from value destroying investment, which is a complementary reason why these firms should benefit from public listing.

Kashefi Pour and Lasfer (2013) argue that firms often intend to rebalance their financial leverage and replace debt with equity after listing at a stock market. For firms that retain high financial leverage some of the expected listing benefits do not materialize and they have less incentive to stay in the equity market. We thus expect a negative association between financial leverage (*Leverage*) and incentives to remain listed. Furthermore, Mehran and Peristiani (2010) and Bharath and Dittmar (2010) suggest that firms list their equity at a stock market with the aim to enhance their financial visibility. They show that firms that experience a decline in the interest of financial analysts, institutional investors, and investors trading the stock do not realize the visibility and liquidity benefits of public listing and they are more likely to leave the market. We thus use the proportion of institutional ownership (*InstOwn*), the change in analyst following (*dAnalysts*) and stock turnover (*Turnover*) as additional proxies for listing benefits.

To be able to aggregate the individual measures we normalize them by subtracting their mean values and dividing the difference by their standard deviation. We add the measures up and we divide the result by the number of non-empty measures following the formula below. We require at least three of the seven measures to be available to compute the listing incentive index.

L-Index = (Capex + R&D + ME/BE – Leverage + dAnalysts + InstOwn + Turnover)/N

where *Capex* are the normalized capital expenditures scaled by net sales, *R&D* are the normalized research and development expenditures scaled by net sales, *ME/BE* is the normalized ratio of market value of equity divided by book value of equity, *Leverage* is the normalized ratio of total debt as a percentage of total assets, *dAnalysts* is equal to 1 if analyst coverage has increased over the past 12 months, -1 if analyst coverage have declined and 0 if analyst coverage has not changed, *InstOwn* is the normalized proportion of institutional

ownership, *Turnover* is the normalized ratio of stock traded to stocks outstanding over the past 12 months.

We define a dummy variable *Big4* that is equal to one if a firm in a given fiscal year is audited by PricewaterhouseCoopers (PwC), Ernst & Young (E&Y), Deloitte, or KPMG, and zero otherwise. We define a dummy variable *Q4* that is equal to one in the last quarter of the fiscal year and zero otherwise. We define a dummy variable *SOX* that is equal to one if the fiscal year end of the current quarter is in year 2003 or later and zero otherwise.

To measure insider trading activity we aggregate all open market purchases and sales in a firm's common stock reported over a fiscal quarter to the SEC on Form 4 in including only observations for which the accuracy was verified with very high level of confidence by the Thomson Financial Insider Filing Data (TFN) database. As insider trading is limited (in some cases prohibited) before earnings announcements, we define a fiscal quarter as starting one day after the previous quarter's earnings announcement and ending at the current quarter's earnings announcement. We assume no insider trading in a firm-quarters for which we find no record in the TFN database if at the same time there is at least one transaction of any kind in one of the preceding quarters and also in one of the following quarters. This condition is imposed to make sure that we do not treat firms or periods that are not covered by the TFN database as 'no trading' observations.

Besides managing earnings firms 'in danger' can perform RSS that reduces the number of outstanding shares and correspondingly mechanically increases the share price. To investigate this alternative course of action we define a variable *Split* that is equal to one if a company performed a reverse stock split in the 180 days of the 'remedy period' following 'time zero' and it is zero otherwise. Finally, to analyze if firms 'in danger' that manage earnings upwards

or that perform RSS have a higher probability to maintain their listing we define a dummy variable *Survive* that is equal to one if a firm is listed on NASDAQ three years after 'time zero' and it is zero otherwise.

Finally, we measure we compute earnings response coefficients (ERC) to see the stock price reaction on unexpected earnings and how this reaction is conditioned by discretionary accruals in the reported earnings. We measure unexpected earnings (*UE*) the difference between announced earnings-per-share and the most recent mean consensus forecast as provided by IBES scaled by stock price at the time of the forecast publication. As analyst forecast for accruals is not available we use the performance-matched discretionary accruals (*pmDACC*) as a proxy for the 'surprise in accruals', i.e. the deviation of reported accruals from the level that would be expected in a firm of given performance.

3.2. Sample

We collect quarterly accounting data for all NASDAQ firms for the sample period between March 1998 and December 2011. We start our sample period in March 1998 because the exception from $1 rule was abolished effective on February 22, 1998, and so since that time we can consider all firms violating the requirement to be 'in danger' of being delisted. We end the sample period in 2011 because we require three years of post-danger data to see if a company maintained its listing. We obtain capital market data on stock prices, trading volumes, shares outstanding and stock splits from CRSP, quarterly accounting data from COMPUSTAT North America, analyst coverage data from I/B/E/S quarterly summary history file, institutional ownership data from FactSet/LionShares and aggregated by Ferreira and Matos (2008), data on firm auditors from Audit Analytics, and data on insider trading from the Thomson Financial Insider Filing Data (TFN).

As companies in danger are granted 180 days to regain compliance with the requirement, it is important for us to identify quarterly earnings announcements that occur within this 'remedy period' when we expect firms have incentives to boost their stock price. Due to that we use quarterly data for our analysis. Higher than annual data frequency is preferable also because quarterly earnings data are less affected by the inherent characteristics of accrual to reverse in the periods following the manipulation. Using annual data would involve lumping together the first and second quarter after 'time zero' when we expect income increasing earnings management with preceding or following quarters (depending on the timing of 'time zero' in the fiscal year) where we expect no effect or an accrual reversion respectively.

The initial sample comprises 162 397 observations (5 892 firms) from non-financial and non-utilities industries. We exclude 23 251 observations (190 firms) due to the lack of accounting information availability required for total accruals computation. We further exclude 40 461 observations that did not have at least 8 observations in an industry, quarter and fiscal year end date combination that we require to compute discretionary accruals in the first-stage cross-sectional regression. We exclude additional 27 425 observations (1 312 firms) because the data on the company's auditor is unavailable. From the control group we also exclude 23 661 observations (638 firms) of firms that were in danger at some point during the sample period, but they are not in danger in this quarter because the accrual generating process in these firms may not be representative of the overall pattern. Our final sample thus consists of 47 599 observations (2 532 firms) of companies from 'control group' (i.e. never being in danger) and companies being in danger for a first time. The sample selection procedure is summarized in Panel A of Table 1.

INSERT TABLE 1 HERE

Table 2 shows the descriptive statistics for our final sample. Panel A is based on all observations, Panel B on the subsample of firms from the control group that never encountered the danger of being delisted, and Panel C is based on the subsample of firms that are in danger of being delisted. The mean (median) value of *DACC* for the full sample is negative -0.004 (-0.002). As expected, the performance-matched *DACC* have the mean (median) value for the full sample close to zero, specifically -0.001 (0.000). It is well established in prior research that *DACC* are positively correlated with performance (Kothari et al. 2005). As firms 'in danger' are poor performers their *DACC* are more negative than those of the control group, which is in line with the existing literature of earnings management of distress firms (DeAngelo et al. 1994; DeFond and Subramanyam 1998). In contrast, both the mean and the median of performance matched *DACC* are higher for firms in danger than for the control group, which provides preliminary evidence consistent with our Hypothesis 1.

INSERT TABLE 2 HERE

Table 3 shows the correlation matrix for the variables we use. The table provides evidence about the expected correlation between discretionary accruals (*DACC*) or performance matched discretionary accruals (*pmDACC*) with being in danger (*Danger*), firm´s performance (*ROA*. Moreover, the matrix also indicates the expected negative effect of presence of Big-4 auditor and the audited quarter on accruals. All these correlations are significant at the 5% level. The correlation matrix thus suggests associations consistent with our hypotheses that firms 'in danger' have on average higher *pmDACC*.

INSERT TABLE 3 HERE

4. Results

Table 4 reports our main result. Consistent with the univariate results reported in Table 3 the first model in Table 4 shows that firms 'in danger' have significantly negative *DACC*. This result is driven by their poor performance. When we adjust for firm performance either by including *ROA* as an additional explanatory variable, by matching on performance, or by the combination of the two approaches, the slope coefficient at *Danger* turns significantly positive. Hence, after adjusting for performance firms 'in danger' have more positive discretionary accruals, which is consistent with Hypothesis 1. This suggests that firms 'in danger' use accrual-based earnings management to portray themselves in a more favourable light to the investors. Furthermore, variable *Danger* remains positive significant for both *DACC* and *pmDACC* after controlling for firm size (*LnSales q-1*).

INSERT TABLE 4 HERE

In Table 5 we investigate the sensitivity of *DACC* reported by firms 'in danger' to the benefits and costs of earnings management. If the documented *DACC* result from opportunistic application of accounting discretion as we suggest, we expect them to be higher when firms 'in danger' have strong incentives to maintain their listing and lower when earnings management is costly. We suggest that the main benefit of earnings management for firms 'in danger' is in increasing their chances to maintain their listing. Indeed, we show below that firms with high *DACC* are more likely to maintain their listing three years after encountering the delisting danger. We expect firms 'in danger' that derive greater benefits from public listing to manage earnings more aggressively. We approximate the benefits firms derive from their public listing by *L-Index* (discussed above).

L-Index is based on variables identified in past research. Nevertheless, their aggregation has not been used in the past. It is thus important to verify its validity. We thus first examine the association between *L-Index* and the incidence of reverse stock splits (RSS) and between *L-Index* and maintained listing on the stock market. Firms 'in danger' may decide to make an RSS that mechanically increases their stock price and restores compliance with the minimum bid price requirement. In fact, NASDAQ explicitly states that it considers RSS as an acceptable method for firms violating the minimum bid price requirement to regain compliance.[5] Even though an RSS seems to be an easy way to increase a firm's stock price past research shows that announcing an RSS reveals managerial pessimism about their company's future and so firms tend to be reluctant to perform it (Peterson and Peterson 1992). Macey et al. (2008) quote Barry Siegel, chairman and chief executive of Driversshield.com, who suggested that "a reverse split is an act of desperation. It sends a terrible signal that management has tried everything it knows to lift the stock price and nothing has worked". We thus argue that a firm 'in danger' that performs RSS clearly demonstrates its strong incentives to maintain its listing. If *L-Index* captures well the listing incentives we expect it to be positively associated with the likelihood of an RSS in the 'remedy period'. Consistent with this prediction Table 6 shows that *L-Index* predicts the likelihood of an RSS.

Second, we investigate how *L-Index* is associated with the likelihood of maintained listing. Firms with stronger listing incentives should be more dedicated to securing their survival on the market, which should translate into a higher rate of success in averting the delisting. Again, consistent with this prediction Table 6 shows that firms with high *L-Index* are more likely to

[5] See https://listingcenter.nasdaq.com/Material_Search.aspx?cid=14&mcd=LQ.

maintain their listing three years after encountering the delisting danger (*Survive*). To make sure that this result is not identical to the one on the incidence of RSS we restrict the test for firms 'in danger' that do not make a RSS and we observe a similar positive association between *L-Index* and *Survive*. Taken together observing that *L-Index* is associated with the likelihood of performing an RSS and with the likelihood of survival of the market we conclude that *L-Index* proxies as intended for the listing benefits.

We now investigate the association between *L-Index* and *DACC*. We argue that potential benefits of earnings management are greater for firms with higher *L-Index* and so we expect more positive *DACC* reported by firms with high *L-Index* (Hypothesis 2A). Consistent with this prediction the interaction term *Danger * L-Index* reported in Table 5 is positive and strongly significant, which implies that firms 'in danger' that have stronger listing incentives manage their earnings more aggressively.

Furthermore, we analyse the impact of audit and audit quality on *DACC*. We argue that high quality audit limits managerial discretion in application of accounting principles. We first interact the audited quarter dummy (*Q4*) and the Big-4 auditor dummy (*Big4*) with *Danger* and then we also include a triple interaction (*Danger * Big4 * Q4*) that captures specifically the effect of high quality audit. Consistent with our expectations both simple interaction with *Danger* are negative, but only the one for a large auditor is significant. More importantly, the triple interaction (*Danger * Big4 * Q4*) is negative and significant. This suggests that firms 'in danger' inflate *DACC* less if they are audited by a large auditor.

In a similar vein we expect firms 'in danger' to have less positive *DACC* after the implementation of SOX that has significantly increased the cost of earnings management by imposing more rigorous internal control mechanisms and by increasing legal penalty for

offenders. Consistent with this prediction we find the interaction term *Danger * SOX* significantly negative. These results support the idea that our main result is driven by opportunistic accounting by firms 'in danger' that is constrained by factors increasing the cost of earnings management (Hypothesis 2B).

INSERT TABLE 5 HERE

Next, we investigate whether the inflated *DACC* reflect a mere attempt to mislead investors by camouflaging the true performance of the company or whether they signal information about managerial expectations of a company's prospects. The results discussed above suggest that managerial decisions on earnings management reflect the cost-benefit trade-off firms face. We argue that besides external factors such as audit quality and SOX the cost of earnings management is also affected by managerial expectations of the company's future performance. If managers anticipate a performance improvement they should be less concerned that the inflated numbers will be challenged by disenchanted investors in the future as the stronger performance will help the firm compensate for the accrual reversal. On the other hand, if managers do not believe that a performance recovery is on the way they likely consider earnings management only a temporary solution that merely postpones the revelation of the true situation of the company, that may trigger legal and other action against the management. Hence, we propose that managers find earnings management more attractive and they are more prone to inflating earnings when they expect strong firm performance in the future. In that case *DACC* could help the market distinguish between strong and weak players.

To test the implications of this argument we examine in Table 7 whether *DACC* reported by firms 'in danger' are associated with managerial optimism about their firm future and with firm quality revealed *ex post*. We measure managerial optimism by insider purchases over two fiscal

quarters ending at the first earnings announcement following 'time zero'. We expect a positive association between the incidence of insider purchases and reported *DACC*. For the sake of completeness we also consider insider sales. The prediction for insider sales is not clear though. On the one hand, mangers may want to sell if they consider firm outlook bleak. Nevertheless, such as sale would involve a significant legal jeopardy. Past research shows that insiders refrain from selling their stocks before reporting bad news (Huddart et al. 2007; Ke et al. 2003; Noe 1999). Not knowing, which of the two effect likely dominates we do not interpret the result on insider sales. Consistent with our expectations *DACC* reported by firms 'in danger' are higher if managers have recently purchased stocks in their own firms. This suggests that the intensity of earnings management in firms 'in danger' is associated with managerial optimism about their company's future.

We further investigate whether firms 'in danger' that report high *DACC* exhibit higher quality *ex post* following the delisting threat. We use four proxies of firm quality. First, we consider a firm's ability to maintain its listing as we expect stronger players to be more likely to avert their delisting. Table 8 indeed shows a positive association between *DACC* and *Survive* that indicates that a firm kept its listing three years after encountering the delisting threat. We examine the three remaining measures for firms that maintained their listing (*Survive* = 1). Even though the delisted firms typically continue their operations and so their accounting profitability is measurable, and sometimes they continue trading on OTC BB or PinkSheets and so their stock returns could be computed (with some data limitation) we do not do so. Past research suggests that involuntary delisting tends to be associated with a significant stock price decline (Baker and Meeks 1991; Macey et al. 2008; Sanger and Peterson 1990; Shumway 1997) and it is plausible to believe that it can also have an impact on the firm's reputation and credibility among business partners, which can harm its operating profitability. Thus for the remaining

three measures we only compare firms that kept trading three years after encountering the delisting threat.

Table 8 shows that the 'surviving' firms that have higher *DACC* tend to exhibit higher quality *ex post*. Unsurprisingly, cash flows from operations *(CFO*) reported 'in danger' has a strong positive impact on the mean return on assets measures over the following three fiscal years. Interestingly, however, reported *DACC* unlike normal accruals *NACC* are also positively associated with future profitability. Table 8 also shows that firms 'in danger' with high *DACC* have stronger market-adjusted stock returns over one year following the delisting danger, which suggests that the market gradually incorporates their quality into stock prices. Finally, Table 8 also shows that high *DACC* reported 'in danger' are associated with a higher likelihood of insider purchases in the year following the delisting danger. We suggest that the insider purchases indicate managers' confidence in longer-term future and so we expect insiders to be more likely to purchase stocks in high quality rather than low quality firms. Taken together these results suggest that firms that inflate their *DACC* are of higher quality.

Finally, in Table 9 we investigate earnings response coefficients (ERC) of firms 'in danger' to see how the market reacts on earnings surprises and on abnormal accruals. If investors understand that higher *DACC* convey favorable information about the prospects of firms 'in danger' we expect them to react on these accruals more favorably than in other firms. Results reported in Table 9 confirm a strong positive stock price reaction on unexpected earnings (*UE*) measured as a scaled difference between the announced earnings-per-share and the most recent mean consensus forecast as provided by IBES. As analyst forecast for accruals does not exist we use the performance-matched discretionary accruals *pmDACC* as a proxy for 'accrual surprise', i.e. the deviation of reported accruals from the level that would be expected in a firm

of given performance. The table also provides some evidence that after controlling for overall earnings surprise the stock market reacts on earnings surprises less strongly if they contain more discretionary accruals. The slope coefficient of *pm DACC* is negative with a *p*-value of 0.078 (*p*-value not tabulated). This is broadly consistent with past research that suggests that accruals (Sloan 1996) and discretionary accruals in particular (Xie 2001) predict earnings persistence and they can be seen as a proxy for earnings quality. Market reaction is attenuated if earnings are of lower quality.

We than introduce our *Danger* variable and we observe that unexpected earnings matter less for the stock price reaction when the firm is in danger. This finding may be driven by a number of factors. For example, higher quality analysts may choose not to cover firms in decline, which may adversely affect the precision of forecasts for firms 'in danger'. Furthermore, firms 'in danger can undergo significant restructuring, which implies that not only the level, but the composition of reported earnings matters. More importantly, however, we investigate how the presence of delisting danger affects market perception of discretionary accruals. The interaction term *Danger * pm DACC* is positive and borderline significant (*p*-value of 0.090, not tabulated). In the last model presented in Table 9 we impose an additional condition that insiders did not purchase any stocks over past two quarters. As insider purchases reveal positive information to the market some of this information can already be reflected in the stock price by the time earnings are announced. When considering only firms where this communication channel was not used the slope coefficient of the interaction term *Danger * pm DACC* turns significant (*p*-value of 0.043, not tabulated). This suggests that under 'normal' circumstances investors consider unexpected earnings less informative if they contain more discretionary accruals. Nevertheless, when a firm is 'in danger' this changes and *DACC* amplify the stock market reaction, which is consistent with the signaling explanation.

5. Conclusion

This paper investigates whether firms that are 'in danger' of being delisted from NASDAQ due to the violation of the minimum bid price requirement manage their earnings upwards by increasing their accruals beyond normal levels. We show that firms 'in danger' report positive performance-adjusted *DACC* and the reported *DACC* are higher for firms that derive greater benefits from public listing and hence have 'more to lose' in case they are barred from the stock exchange of their choice. On the other hand, *DACC* are lower in fiscal quarters audited by a large auditor and after the implementation of SOX both of which increase the cost of earnings management. These results suggest that the inflated *DACC* result from a purposeful application of accounting principles aimed at inflating reported earnings.

We further show evidence consistent with the signaling explanation to our findings. We argue that firm-specific costs of earnings management are decreasing in firm quality and future prospects. Hence, we expect managers to manage earnings more aggressively if there are confident about their company's quality and optimistic about its future. We show that *DACC* are higher in firms where managers purchase equity before the firm encounters the delisting danger. We also show that *DACC* are associated with higher likelihood of maintained listing, and conditional on firm survival with higher accounting profitability, better stock returns and higher likelihood of future insider purchases. We thus propose that investors can use *DACC* reported by firms 'in danger' in assessing their quality and prospects and we show that stock prices indeed react stronger on announced earnings if they contain high *DACC*.

Our results suggest firms have strong preferences over their equity trading venue, they are willing to bear costs to defend the listing of their choice. They also suggest that the delisting danger makes firms reveal their quality and expectations about their future, which can be

helpful to the stock exchange in making the delisting decision and to the investors in valuing the firm. Finally, our findings suggest that high quality audit and more restrictive accounting regulation constrains the application of accounting principles, which limits managerial opportunism but it may also have an indirect effect on the use earnings management for signaling private information.

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Tables

Table 1 – Sample Construction

Panel A – All firms

	No. of observations	No. of firms
Initial sample	162 397	5 892
Missing information for computation of *TACC*	-23 251	-190
Insufficient peer group for estimating *DACC*	-40 461	-1 220
Missing information for at least 3 *L-Index* components	-0	-0
Missing information about auditors	-27 425	-1 312
Other than first time 'in danger'	-23 661	-638
Final sample	47 599	2 532

Panel B – Firms in danger of being delisted

	No. of observations	No. of firms
Initial sample	3 288	1 737
Missing information for computation of *TACC*	-247	-103
Insufficient peer group for estimating *DACC*	-886	-451
Missing information about auditors	-761	-445
Being in danger during ineffectiveness of $1 rule	-413	-158
Excluding multiple receiving notification letter	-481	-80
Final sample	500	500239

The initial sample includes all firms listed on NASDAQ market over the period between March 1998 and 2011. Insufficient peer group for cross-section regression of discretionary accruals (DACC) refer to companies that have less than 8 peer firms in control group. Being in danger during ineffectiveness of $1 represents events where due to special occasions the minimum bid price rule was temporarily ineffectiveness.

Table 2 – Descriptive Statistics

	N	Mean	StdDev	Median	Min	Max
Panel A – All firms						
TA	47 599	-0.020	0.061	-0.015	-0.379	0.192
DACC	47 599	-0.004	0.053	-0.002	-0.318	0.200
pm DACC	47 599	-0.001	0.062	0.000	-0.270	0.264
Danger	47 599	0.011	0.102	0	0	1
Incentive Index	47 599	0.137	0.492	0.109	-1.650	3.367
ROA	47 599	-0.011	0.073	0.007	-0.492	0.109
Big 4 Auditor	47 599	0.807	0.394	1	0	1
Audited Quarter	47 599	0.240	0.427	0	0	1
SOX	47 599	0.734	0.442	1	0	1
Size q-1 (LnSales)	46 872	3.764	1.745	3.818	-3.219	7.445
Survive	47 599	0.763	0.426	1	0	1
Sales q-1; q0	47 599	0.539	0.498	1	0	1
Purch q-1; q0	47 599	0.273	0.445	0	0	1
Panel B – Firms from control group						
TA	47 099	-0.020	0.060	-0.015	-0.379	0.192
DACC	47 099	-0.004	0.052	-0.002	-0.318	0.200
pm DACC	47 099	-0.001	0.061	0	-0.270	0.264
Danger	47 099	0	0	0	0	0
Incentive Index	47 099	0.141	0.490	0.114	-1.650	3.367
ROA	47 099	-0.010	0.071	0.007	-0.492	0.109
Big 4 Auditor	47 099	0.808	0.394	1	0	1
Audited Quarter	47 099	0.240	0.427	0	0	1
SOX	47 099	0.738	0.440	1	0	1
Size q-1 (LnSales)	46 402	3.783	1.734	3.836	-3.219	7.445
Survive	47 099	0.765	0.424	1	0	1
Sales q-1; q0	47 099	0.542	0.498	1	0	1
Purch q-1; q0	47 099	0.271	0.445	0	0	1
Panel C – Firms being in danger of involuntary delisting						
TA	500	-0.066	0.122	-0.038	-0.379	0.192
DACC	500	-0.035	0.121	-0.017	-0.318	0.200
pm DACC	500	0.018	0.117	0.012	-0.270	0.264
Danger	500	1	0	1	1	1
Incentive Index	500	-0.241	0.463	-0.300	-1.592	1.894

ROA	500	-0.130	0.142	-0.086	-0.492	0.109
Big 4 Auditor	500	0.752	0.432	1	0	1
Audited Quarter	500	0.272	0.445	0	0	1
SOX	500	0.372	0.484	0	0	1
Size q-1 (LnSales)	470	1.886	1.788	1.920	-3.219	7.445
Survive	500	0.506	0.500	1	0	1
Sales q-1; q0	500	0.236	0.425	0	0	1
Purch q-1; q0	500	0.438	0.497	0	0	1

The table reports the number of observations (N), mean (Mean), standard deviation (StdDev), median (Median), minimum (Min) and maximum (Max) for the primary variables for the full sample of all listed companies on NASDAQ (Panel A), for the firms from control group (Panel B), and for the firms facing threat of being involuntary delisted, i.e. received notification letter about non-compliance of minimum bid price criteria (Panel C). TA is the total accruals defined as earnings before extraordinary item minus cash flow from operation scaled by average assets of time q-1 and q. Discretionary accruals (DACC) are residuals from cross-sectional estimation of Modified Jones model. The performance matching discretionary accruals (pm DACC) represents difference between Modified Jones model discretionary accruals and Modified Jones discretionary accruals of closest peer from control group. Danger is a dummy variable equals to 1 if firms received notification letter and zro otherwise. Incentive index is mean value of normalized listing benefits proxies as analyst coverage, stock turnover, rebalancing of leverage, R&D ration, Capex ratio, institutional ownership and Market-to-Book ration. ROA is defined as income before extraordinary items divided average value of total assets for firm i in the quarter t-1 and total assets for firm i in the quarter t. Big 4 auditor is a dummy variable equals to 1 if firm is audited by big 4 auditor. Audited quarter is a dummy variable equals to 1, if current quarter is fourth quarter. Sarbanes Oxley Act (SOX) is a dummy variable equals to 1 if Sarbanes Oxley Act is in force. Size (LnSales q-1) defined as natural logarithm of lagged Sales. *Survive* is a dummy variable equal to one a firm 'in danger' maintained its listing on the stock market 3 years after encountering the delisting threat and zero otherwise. *Purch q-1; q0* is a dummy variable equal to one insiders purchased shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *Sales q-1; q0* is a dummy variable equal to one insiders sold shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. All variables are Winsorized at 1%.

Table 3 – Correlation Matrix

	TA	*DACC*	*pmDACC*	*Danger*	*L-Index*	*ROA*	*Big4*	*Q4*	*SOX*	*LnSales*	*Survive*	*Sales q-1; q0*
TA	1											
DACC	**0.8550**	1										
pm DACC	**0.5140**	**0.649 0.0**	1									
Danger	**-0.0780**	**-0.059 0.0**	**0.031 0**	1								
L-Index	**0.0300**	-0.006 0.19	**-0.015 0**	**-0.079 0**	1							
ROA	**0.5180**	**0.451 0**	**0.067 0**	**-0.168 0**	**-0.021 0**	1						
Big4	**-0.0190**	**-0.049 0**	**-0.054 0**	**-0.014 0**	**0.147 0**	**0.025 0**	1					
Q4	**-0.1320**	**-0.033 0**	-0.002 0.60	0.008 0.09	**-0.015 0**	**-0.029 0**	0.003 0.48	1				
SOX	**0.0500**	**0.017 0**	0.005 0.27	**-0.085 0**	**0.082 0**	**0.079 0**	0.000 0.96	-0.005 0.31	1			
Size q-1 (LnSales)	**0.0460**	0.003 0.54	**-0.084 0**	**-0.108 0**	**-0.081 0**	**0.404 0**	**0.205 0**	0.002 0.65	**0.135 0**	1		
Survive	0.008 0.07	**0.018 0**	-0.008 0.10	**-0.062 0**	**0.071 0**	**0.055 0**	**0.029 0**	0.002 0.74	**-0.068 0**	**0.071 0**	1	
Sales q-1; q0	**0.0380**	**0.012 0.01**	**-0.031 0**	**-0.063 0**	**0.298 0**	**0.141 0**	**0.103 0**	0.002 0.74	**0.034 0**	**0.193 0**	**0.0720**	1
Purch q-1; q0	**-0.0260**	**-0.014 0**	**0.009 0.04**	**0.038 0**	**-0.043 0**	**-0.072 0**	**-0.013 0**	0.005 0.30	**-0.091 0**	**-0.049 0**	**-0.0180**	-0.006 0.17

Pairwise correlation coefficients and the corresponding p-values (in parentheses). Correlations significant at better than a 5% level are highlighted in bold. TA is the total accruals defined as earnings before extraordinary item minus cash flow from operation scaled by average assets of time q-1 and q. Discretionary accruals (DACC) are residuals from cross-sectional estimation of Modified Jones model. The performance matching discretionary accruals (pm DACC) represents difference between Modified Jones model discretionary accruals and Modified Jones discretionary accruals of closest peer from control group. Danger is a dummy variable equals to 1 if firms received notification letter and zero otherwise. Incentive index is mean value of normalized listing benefits proxies as analyst coverage, stock turnover, rebalancing of leverage, R&D ration, Capex ratio, institutional ownership and Market-to-Book ration. ROA is defined as income before extraordinary items divided average value of total assets for firm i in the quarter t-1 and total assets for firm i in the quarter t. Big 4 auditor is a dummy variable equals to 1 if firm is audited by big 4 auditor. Audited quarter is a dummy variable equals to 1, if current quarter is fourth quarter. SOX is a dummy variable equals to 1 if Sarbanes Oxley Act is in force. Size (LnSales q-1) defined as natural logarithm of lagged Sales. *Survive* is a dummy variable equal to one a firm 'in danger' maintained its listing on the stock market 3 years after encountering the delisting threat and zero otherwise. *Purch q-1; q0* is a dummy variable equal to one insiders purchased shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *Sales q-1; q0* is a dummy variable equal to one insiders sold shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. All variables are Winsorized at 1%.

Table 4 – Discretionary Accruals

	DACC	*DACC*	*DACC*	*pm DACC*	*pm DACC*	*pm DACC*
	coef/t	*coef/t*	*coef/t*	*coef/t*	*coef/t*	*coef/t*
Danger	-0.031***	0.009***	0.005**	0.019***	0.027***	0.022***
	(-12.98)	(4.03)	(2.21)	(6.83)	(9.46)	(7.82)
ROA		0.328***	0.429***		0.063***	0.133***
		(109.48)	(129.47)		(16.11)	(29.87)
LnSales q-1			-0.007***			-0.005***
			(-51.87)			(-28.16)
Intercept	-0.004***	-0.001***	0.025***	-0.001***	-0.000	0.019***
	(-17.09)	(-4.36)	(45.49)	(-3.18)	(-1.01)	(25.33)
Number of observations	47 599	47 599	46 872	47 599	47 599	46 872
Adjusted R2	0.004	0.204	0.266	0.001	0.006	0.026

The table shows discretionary accruals reported by firms 'in danger' of being delisted. The dependent variable *DACC* are discretionary abnormal accruals measured by the residuals from the cross-sectional modified Jones model. *pmDACC* are performance-matched discretionary accruals based on Kothari et al. (2005). *Danger* is a dummy variable equal to 1 in the fiscal quarter during which a company experienced the danger of delisting and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. All continuous variables Winsorized at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

Table 5 – Benefits and Costs

	DACC	*DACC*	*DACC*	*DACC*	*DACC*	*DACC*
	coef/t	*coef/t*	*coef/t*	*coef/t*	*coef/t*	*coef/t*
*Danger * L-Index*	0.027***					0.028***
	(6.01)					(6.40)
*Danger * Big4*		-0.017***		-0.006		-0.007
		(-3.56)		(-1.11)		(-1.30)
*Danger * Q4*			-0.004	0.028***		0.031***
			(-0.93)	(2.93)		(3.23)
*Big4 * Q4*				-0.003***		-0.003***
				(-2.60)		(-2.59)
*Danger * Big4 * Q4*				-0.042***		-0.044***
				(-3.80)		(-4.03)
*Danger * SOX*					-0.010**	-0.013***
					(-2.21)	(-2.97)
Danger	0.011***	0.017***	0.006**	0.010**	0.008***	0.022***
	(4.72)	(4.18)	(2.39)	(2.19)	(3.00)	(4.26)
L-Index	-0.000					-0.000
	(-0.25)					(-0.20)
Big4	-0.001**	-0.001		-0.000	-0.001**	-0.000
	(-2.00)	(-1.61)		(-0.18)	(-2.06)	(-0.22)
Q4	-0.002***		-0.002***	0.001	-0.002***	0.001
	(-3.84)		(-3.76)	(0.70)	(-3.89)	(0.70)
SOX					-0.001	-0.001
					(-1.23)	(-1.25)
ROA	0.429***	0.429***	0.429***	0.428***	0.428***	0.429***
	(128.83)	(128.84)	(129.15)	(128.51)	(128.65)	(128.69)
LnSales q-1	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	(-49.61)	(-50.17)	(-51.78)	(-50.07)	(-49.69)	(-49.11)
Intercept	0.026***	0.025***	0.025***	0.025***	0.026***	0.025***
	(39.97)	(39.71)	(45.30)	(36.38)	(36.77)	(33.59)
Number of observations	46 872	46 872	46 872	46 872	46 872	46 872
Adjusted R2	0.267	0.267	0.267	0.267	0.267	0.268

The table shows the effect of factors influencing benefits and costs of earnings management on discretionary accruals reported by firms 'in danger' of being delisted. The dependent variable *DACC* are discretionary abnormal accruals measured by the residuals from the cross-sectional modified Jones model. *Danger* is a dummy variable equal to 1 in the fiscal quarter during which a company experienced the danger of delisting and zero otherwise. *L-Index* is a listing benefit index based on seven measures identified in past research to be related to listing benefits (book-to-market equity ratio, research and development ratio, capital expenditure ratio, financial leverage ratio, stock turnover, analyst coverage, institutional ownership). *Big4* is a dummy variable equal to one if a firm is audited by a Big-4 auditor (PwC, E&Y, Deloitte, KPMG) and zero otherwise. *Q4* is a dummy variable equal to one in the fourth (i.e. audited) fiscal quarter and zero otherwise. *SOX* is a dummy variable equal to one if the fiscal year end of the current quarter is in year 2003 or later and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. All continuous variables Winsorized

at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

Table 6 – Listing Benefits Index

	Split	*Survive*	*Survive | No Split*
	coef/t	*coef/t*	*coef/t*
L-Index	0.305**	0.345***	0.329**
	(2.55)	(3.02)	(2.48)
ROA q-1	0.582	1.444***	1.404***
	(1.39)	(3.65)	(3.10)
LnSales q-1	0.094***	0.001	-0.004
	(2.79)	(0.04)	(-0.10)
Intercept	-0.617***	0.029	-0.059
	(-6.64)	(0.33)	(-0.58)
Number of observations	761	761	550
Adjusted R2	0.014	0.019	0.020

The table shows the association between the listing benefits index (*L-Index*) and the incidence of reverse stock splits (*Split*) and a firm's survival on the stock market. The dependent variable *Split* is a dummy variable equal to one a firm 'in danger' of delisting performed a reverse stock split in the 180 of the 'remedy period' and zero otherwise. The dependent variable *Survive* is a dummy variable equal to one a firm 'in danger' maintained its listing on the stock market 3 years after encountering the delisting threat and zero otherwise. *L-Index* is a listing benefit index based on seven measures identified in past research to be related to listing benefits (book-to-market equity ratio, research and development ratio, capital expenditure ratio, financial leverage ratio, stock turnover, analyst coverage, institutional ownership). *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. All continuous variables Winsorized at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

Table 7 – Managerial Expectations

	DACC	*pm DACC*
	coef/t	*coef/t*
*Danger * Purch q-1; q0*	0.021***	0.020***
	(4.42)	(3.46)
*Danger * Sales q-1; q0*	0.003	-0.012*
	(0.54)	(-1.78)
Purch q-1; q0	-0.001*	0.000
	(-1.65)	(0.42)
Sales q-1; q0	-0.000	-0.001**
	(-0.19)	(-2.40)
Danger	-0.035***	0.003
	(-10.18)	(0.69)
ROA q-1	0.099***	-0.022***
	(25.72)	(-4.89)
LnSales q-1	-0.002***	-0.002***
	(-11.97)	(-13.33)
Intercept	0.004***	0.009***
	(6.02)	(10.60)
Number of observations	46 126	46 126
Adjusted R2	0.019	0.008

The table shows the association between insider purchases before encountering the delisting danger and reported discretionary accruals. The dependent variable *DACC* are discretionary abnormal accruals measured by the residuals from the cross-sectional modified Jones model scaled by total assets. The dependent variable *pmDACC* are performance-matched discretionary accruals based on Kothari et al. (2005) scaled by total assets. *Danger* is a dummy variable equal to 1 in the fiscal quarter during which a company experienced the danger of delisting and zero otherwise. *Purch q-1; q0* is a dummy variable equal to one insiders purchased shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *Sales q-1; q0* is a dummy variable equal to one insiders sold shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. All continuous variables Winsorized at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

Table 8 – Firm Quality

	Survive	*Survive*	*mnROA 3y*	*mnROA 3y*	*ExRet y+1*	*ExRet y+1*	*Purch y+1*	*Purch y+1*
	coef/t	*coef/t*	*coef/t*	*coef/t*	*coef/t*	*coef/t*	*coef/t*	*coef/t*
DACC	1.870***		0.378*		6.698**		0.708**	
	(4.78)		(1.89)		(2.51)		(2.22)	
pm DACC		1.131**		0.555**		4.820**		0.453*
		(2.57)		(2.54)		(2.17)		(1.77)
NACC	1.876**	1.350	0.361	0.525				
	(2.29)	(1.57)	(0.95)	(1.35)				
CFO	0.849**	0.949**	1.968***	2.147***				
	(2.03)	(2.10)	(10.06)	(9.91)				
ROA					-11.293***	-8.654***	-0.709**	-0.405*
					(-4.54)	(-4.20)	(-2.55)	(-1.80)
LnSales q-1					0.320**	0.250	0.007	-0.000
					(2.00)	(1.62)	(0.37)	(-0.03)
Intercept	-0.181***	-0.268***	-0.138***	-0.142***	0.522	0.684	0.451***	0.471***
	(-3.05)	(-4.82)	(-5.27)	(-5.76)	(1.19)	(1.61)	(8.85)	(9.57)
Num. obs.	960	960	323	323	220	220	326	326
Adjusted R2	0.020	0.006	0.235	0.241	0.075	0.068	0.015	0.010

The table shows the association between discretionary accruals reported by firms 'in danger' and proxies of firm quality. The dependent variables include *Survive* is a dummy variable equal to one a firm 'in danger' maintained its listing on the stock market 3 years after encountering the delisting threat and zero otherwise, *mnROA 3y* is mean return on assets over three fiscal years following the delisting danger, *ExRet y+1* is a market-adjusted stock return over one year after encountering the delisting threat, and *Purch y+1* is a dummy variable equal to one insiders purchased shares in their own firm one year after encountering the delisting threat and zero otherwise. *DACC* are discretionary abnormal accruals measured by the residuals from the cross-sectional modified Jones model scaled by total assets. *pm DACC* are performance-matched discretionary accruals based on Kothari et al. (2005). *NACC* are normal accruals measured by the predicted values from the cross-sectional modified Jones model scaled by total assets. *CFO* is quarterly cash flow from operations scaled by total assets. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. All continuous variables Winsorized at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

Table 9 – Earnings Response Coefficients

	ExRet 3d	*ExRet 3d*	*ExRet 3d*	*ExRet 3d*	*ExRet 3d* | *Purch q-1q0* = 0
	coef/t	*coef/t*	*coef/t*	*coef/t*	*coef/t*
*Danger * UE*			-0.144***	-0.150***	-0.216***
			(-4.03)	(-4.18)	(-4.62)
*Danger * pm DACC*				0.083*	0.136**
				(1.69)	(2.02)
UE	0.221***	0.223***	0.263***	0.266***	0.341***
	(14.59)	(14.68)	(14.85)	(14.98)	(14.41)
pm DACC		-0.014*		-0.018**	-0.027***
		(-1.76)		(-2.22)	(-2.86)
Danger			0.007	0.006	-0.003
			(1.13)	(0.96)	(-0.42)
LnSales q-1	0.002***	0.002***	0.002***	0.002***	0.001***
	(6.37)	(6.27)	(6.54)	(6.45)	(4.49)
Intercept	-0.004***	-0.004***	-0.004***	-0.004***	-0.004**
	(-3.42)	(-3.36)	(-3.63)	(-3.58)	(-2.46)
Number of observations	29 776	29 776	29 776	29 776	21 850
Adjusted R2	0.009	0.009	0.009	0.009	0.011

The table shows earnings response coefficients conditional of the use of discretionary accruals. The dependent variable *ExRet 3d* is a 3-day market-adjusted stock return around a quarterly earnings announcement. *UE* are the unexpected earnings measured as the difference between actual earnings-per-share and the most recent mean consensus forecast as provided by IBES scaled by stock price at the time of the announcement. *pmDACC* are performance-matched discretionary accruals based on Kothari et al. (2005). *Danger* is a dummy variable equal to 1 in the fiscal quarter during which a company experienced the danger of delisting and zero otherwise. *ROA* is the return on assets defined as quarterly income before extraordinary items divided by average total assets in the beginning and at the end of a fiscal quarter. *LnSales* is the natural logarithm of net sales in a fiscal quarter. *Purch q-1q0* is a dummy variable equal to one insiders purchased shares in their own firm in the fiscal quarter when the firm encountered the delisting threat or in the preceding quarter and zero otherwise. All continuous variables Winsorized at bottom and top 1 per cent. We report *t*-statistics in brackets below the slope coefficients. ***, **, * denote statistical significance at 1 per cent, 5 per cent and 10 per cent respectively.

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