Corporate Governance Rules and Insider Trading Profits

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Abstract

We investigate patterns of abnormal stock performance around insider trades on the Dutch market. Listed firms in the Netherlands have a long tradition of limiting shareholders rights. Using a change in corporate governance regulations as a natural experiment we show that governance rules have a causal effect on insider trading profits. Our results imply that insider transactions are more profitable at firms where shareholder rights are not restricted by anti-shareholder mechanisms. These findings are inconsistent with internal monitoring of insider trading. Rather, we explain this empirical pattern by imperfect substitution between insider trading profits and other private benefits of control.

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I. Introduction

In addition to their attractive compensation packages, executives and other insiders of public firms appear to reap further benefits through their position, at the expense of dispersed shareholders. Studies of legal insider trading suggest that insiders use private information to increase profits from their transactions (Seyhun (1986), Lakonishok and Lee (2001), Piotroski and Roulstone (2005)).[1] Still, proper corporate governance can restrain selfish managerial decisions that are detrimental to the firm: shareholders can prevent abusive actions by monitoring or disciplining managers, or even by firing them. This paper investigates the relation between insider trading and corporate governance using insiders' transactions in the Netherlands, a market where firms have had a long history of oppressing shareholder rights. We contribute to the existent literature on insider trading and corporate governance by alleviating concerns of endogeneity and addressing the causal relationship between governance rules and insider trading profits. In 2004, there were significant modifications in Dutch corporate governance regulations, which we use as a quasi-natural experiment. We take a differences-in-differences (DD) approach to examine whether profits to insider trading changed as a new corporate governance code and legislation strengthening shareholder rights came into effect. Our study is the first to examine simultaneously the impact of both blockholder structure and governance rules on insider trading. Our unique, hand-collected dataset contains information on blockholder ownership, as well as anti-shareholder devices employed by firms.

We motivate an alternative hypothesis to the monitoring argument which has been the only idea to date underpinning the interrelationship between insider trading and corporate governance. We conjecture that if private benefits owed to managerial entrenchment outweigh the profits from insider trading, insider transactions will be a substitute mechanism that insiders resort to if they are barred from exploiting other private benefits. Our findings provide strong empirical support for the substitution hypothesis. This result is valid for insider purchases and sales, depends on the use of anti-shareholder mechanisms, and is robust to the inclusion of several controls previously shown to affect abnormal returns around insider transactions. Lastly, we use this substitution effect to measure private benefits of control enjoyed by insiders.

Our results indicate that insiders earn an average abnormal return of 3.5% over the 40-day window following their purchases. However, this is not because they purchase in response to strong stock price performance. Our findings on the relationship between corporate governance

[1] Although the focus of this study is on legal insider trading, there are several papers to suggest that insiders also cross the line between legal and illegal when trading in the company stock (Meulbroek (1992), Bhattacharya and Marshall (2009)), or backdating their option packages for financial gains (Lie(2005), Heron and Lie (2007) Narayanan, Schipani and Seyhun (2007)).

and insider trading suggest that the government and nonfinancial blockholders do not monitor insider trading activity. The latter are likely to trade on the same signal, thereby amplifying abnormal returns. Concerning the governance mechanisms of the firm, we find strong evidence for the substitution hypothesis. The returns insiders earn on their transactions are higher at firms that do not limit shareholder power through anti-shareholder mechanisms. This can be explained in a framework where insiders dedicate increased attention to their trades once they are unable to reap private benefits of control. Relying on the 2004 corporate governance changes, our DD estimates suggest that it is indeed corporate governance rules that impact insider trading profits. This is further corroborated by regressions with firm fixed effects. Exploiting the substitution effect uncovered in the data, we estimate the lower bound of entrenchment benefits provided by one anti-shareholder mechanism at approximately €15,000 per year. When placing these estimates in the context of our sample, we find that insiders of the average firm enjoy private benefits that are worth at least €245,000. This value is predicated on the assumption of perfect substitution, and, as it is quite moderate, suggests that insider trading profits and other private benefits of control are imperfect substitutes.

The remainder of the paper is structured as follows. In Section 2 we offer a synthesis of prior literature on insider trading and insider option exercises, based on which we then develop our research hypotheses. Section 3 describes the measures used to suppress shareholder rights in the Netherlands. Section 4 presents the data and methodology and in Section 5 we detail our findings and examine alternative explanations for our results. In Section 6 we estimate the value of private benefits in monetary terms. Section 7 concludes the paper.

2. Literature review and hypothesis development

It has long been recognized that insiders are able to trade on private information and hence earn abnormal returns on their trades (Lorie and Niederhoffer (1968), Jaffe (1974)). Despite the transformation and modernization of financial markets, over time, insiders' ability to trade on private information appears to persist (Seyhun (1998), Ravina and Sapienza (2010), Cohen, Malloy, and Pomorski (2011)). The main results of Seyhun (1986, 1998) show that abnormal returns peak around insider sales and depict a valley pattern around purchases. However, the documented abnormal stock price patterns could also be explained by contrarian investing: selling after periods of stock price appreciation and buying after periods of stock price decline. Notwithstanding, the large body of literature concerned with this question shows that insiders earn higher returns on their trades than a naïve contrarian strategy would yield, implying that

they indeed possess private information.[2] In line with prior literature, we hypothesize that *cumulative abnormal returns (CARs) are positive (negative) in the days following the purchase (sale)*. We furthermore expect that *the absolute magnitude of the market reaction will be larger to purchases than to sales*, for sales can be triggered by reasons other than private information, e.g. liquidity needs or diversification concerns. This argument is supported by the results of Jeng, Metrick and Zeckhauser (2003) and Lakonishok and Lee (2001) for US firms, and Friederich, Gregory, Matatko and Tonks (2002) and Fidrmuc et al. (2006) for UK firms. The empirical approach of our paper is different from Rozeff and Zaman (1998), Lakonishok and Lee (2001), Jenter (2005), and Piotroski and Roulstone (2005) in that we focus on individual trades rather than aggregate insider trading, as do Fidrmuc, Goergen and Renneboog (2006) and Ravina and Sapienza (2010).

An ample body of literature shows that firms ultimately benefit from shareholder-oriented corporate governance (Gompers, Ishii and Metrick (2003), Cremers and Nair (2005), Shleifer and Vishny (1997), Bhagat and Bolton (2008)). Recent empirical studies suggest that strong corporate governance curtails insider trading profits (Fidrmuc et al. (2006), Ravina and Sapienza (2010)). Firdmuc et al. (2006) introduced the notion of blockholder monitoring of insider trading. As large shareholders have a greater stake in the company which gives them both stronger incentives to monitor and larger voting power to effectively intervene, these shareholders will monitor the firm more closely. However, major shareholders are not homogenous in terms of their monitoring quality: their ability and incentives to monitor hinges on their type (Holderness and Sheehan (1988), Franks, Mayer and Renneboog (2001)).

Regarding blockholder monitoring of insider trades, Fidrmuc et al. (2006) find that the price reaction after purchases is smaller in the presence of blockholders who are likely to monitor management, i.e. unrelated individuals, families or corporations. Hence, insider trades are less informative at firms with intensive monitoring. Similarly, the empirical findings of Betzer and Theissen (2009) indicate that major block ownership by a nonfinancial firm attenuates the absolute magnitude of abnormal returns both after purchases and sales. Fidrmuc et al. (2006) also document for the UK that the positive price reaction to sales is greater in the presence of institutional blockholders who do not monitor management, but trade on their signals

[2] Lakonishok and Lee (2001) attempt to disentangle contrarian investment strategies and inside information and show that even though insiders are in general contrarian investors, their transactions are more informative in predicting future stock performance than are simple contrarian strategies. Jenter (2005) argues that managers have contrarian views concerning the stock of their own company and perceive the book-to-market effect as a mispricing. Piotroski and Roulstone (2005) document that insider trades are based both on contrarian beliefs and on superior (inside) information on future cash flows. Ravina and Sapienza (2010) show insiders have excellent timing abilities and are not merely purchasing after periods of stock price decline and selling after the stock price has gone up. The results of Fidrmuc et al. (2006) also suggest that insider trades are based on private information.

instead. Finally, the market reaction (positive for purchases and negative for sales) is mitigated if the director already owns a considerable stake in the company, since in this case outside investors also consider the effect of the transaction on director entrenchment. With the above results in mind, we conjecture that *blockholder monitoring by individuals, families and nonfinancial companies impedes profitable insider trading and therefore attenuates abnormal return patterns around insider purchases, sales and option exercises*.

Ravina and Sapienza (2010) provide evidence that governance rules also impact the profitability of insider trades. They show that profits on insider trades are larger at firms with weak governance standards as expressed by the Governance Index of Gompers et al. (2003). Moreover, their findings indicate that the gap between returns on trades of executives and trades of independent directors is wider at firms with poor corporate governance rules. In this paper we examine the impact of corporate governance on the profitability of insider trades and option exercises. The two hypotheses underlying our analysis are what we call the *monitoring hypothesis* and the *substitution hypothesis*. Although theoretically these hypotheses are not mutually exclusive, their testable implications are distinct such that the data allow us to verify them separately.

The *monitoring hypothesis* asserts that strong corporate governance curtails profitable insider trading, as evidenced by the results of Fidrmuc et al. (2006) and Betzer and Theissen (2009). While strong corporate governance has been shown to decrease agency costs, there is no clear-cut explanation as to how it would mitigate profitable insider trading. We scrutinize two channels through which good corporate governance impacts insider trading: increased shareholder awareness in the absence of anti-shareholder mechanisms and blockholder monitoring. Thus, based on the monitoring hypothesis we would find less profitable insider transactions occurring at firms with stronger corporate governance standards, i.e. fewer anti-shareholder devices. To capture the effect of monitoring by blockholders we control for the identity of the largest blockholder of the firm.

The *substitution hypothesis*, in contrast, postulates that gains from insider trading are larger at firms with strong corporate governance as insiders will substitute insider trading with more attractive private benefits at firms where shareholder power is limited, hence corporate governance is weak. Under private benefits of control we intend e.g. the use of company resources for private purposes (Yermack (2006)) or increasing their remuneration by setting low performance targets (Bertrand and Mullainathan (2001)). Liu and Yermack (2007) show that excessive CEO real estate purchases are often preceded by large insider sales and option exercises. Meanwhile, the firm underperforms the market, suggesting that the grandiose CEO home purchases are a sign of CEO entrenchment. We posit that these private benefits can outweigh potential gains from insider trading and insiders will therefore seek private benefits at

firms with weak corporate governance. The results of, Roulstone (2003) and Banerjee and Eckard (2001) support this idea. Roulstone (2003) shows that executive compensation rises significantly after firms impose restrictions on insider trading. The difference is between 4-13% of total compensation. Thus, the paper establishes that insiders substitute private benefits (insider trading profits) with contractual benefits (compensation). We contribute to this strand of the literature by showing that insiders can also substitute one form of private benefits (a higher degree of control over corporate decisions) with another (insider trading profits). Banerjee and Eckard (2001) analyze stock price patterns associated with mergers during the Great Merger Wave of 1897-1903. During this period there were no restrictions at all on insider trading. Surprisingly however, the authors find that for mergers with disclosures similar to today's information dissemination, stock price run-ups relative to the total value gain are not higher than the values observed in the modern merger literature. This result suggests that, despite the complete absence of insider trading regulations, the extent of trading on private information was not higher circa 1900 than is today. A plausible explanation is that insiders enjoyed many *other* sources of private benefits, and thus did not trade extensively on private information.

Empirically, insider trading profits and private benefits of control are likely to be imperfect substitutes. This means that in companies with poor corporate governance, insiders can extract private benefits of control and perform insider trading. Insiders may choose to enjoy private benefits because, for the same amount of gains, these are less risky. Trading on private information does not automatically guarantee a gain. The stock price can decline during an unforeseen industry-wide shock even if the firm's prospects are otherwise encouraging. Moreover, the exact magnitude of gains is uncertain, unlike with consuming private benefits of control. We explore the degree of substitution between insider trading profits and private benefits of control in Section 6 of the paper, and infer that the two are indeed imperfect substitutes.

3. Institutional background: insider trading regulation and corporate governance in the Netherlands

3.1. Insider trading legislation and its enforcement

The essential principles underlying insider trading legislation in the Netherlands hold that market participants are barred from trading on private information and price-sensitive information. The former refers to information that is not publicly available, while the latter refers to information

that is likely to move the firm's stock price.[3] In addition to this prohibition, corporate insiders are required to report their trades in the company's stock and derivative instruments whose value is tied to the firm's share price (e.g. stock options). Insiders, their family up to the second degree, large shareholders, and the company itself have an obligation to disclose their transactions. This obligation was introduced in April 1999 and required all of the above parties to report their transactions no later than 10 days after the end of the month in which they took place. Transactions are disclosed to the Netherlands Authority for the Financial Markets (Autoriteit Financiële Markten, AFM) which subsequently publishes this information on its website and in the financial daily *Financieel Dagblad*. As we analyze individual insider trades, the introduction of the insider trading registry marks the start of our sample period.[4]

In October 2002, regulations were tightened: executive board members and supervisory board members were obliged to report their trades without delay. Finally, rules were changed through the 2005 ratification of the European Market Abuse Directive. From October 2005 onwards, all insiders are required to disclose transactions at most 5 days after their trade. The only exception is if the total value of the insider's transactions in that calendar year does not reach 5,000 EUR. In these cases, the insider can defer disclosure until the cumulative transaction value surpasses the 5,000 EUR threshold.[5] Degryse, De Jong and Lefebvre (2009) analyze the information content of insider trades in the different reporting regimes. Our data suggest that prior to the 2005 regulatory change, insiders other than the management board and supervisory board members disclosed their trades typically 4-7 days after the transaction. Thus, the regulations did not go much further than formalizing the *status quo*. The enforcement of insider trading regulation is the task of the AFM. If, based on the analysis of the stock price, the AFM suspects that an insider has traded on private information, it launches an investigation. If there is sufficient evidence to corroborate the initial suspicion, the AFM reports the case to the public prosecution, after which the insider is indicted. In some cases, the AFM imposes a fine on the company for insider trading. During our sample period the AFM started an annual average of 42 inspections leading to 9 reports to public prosecution and 1 administrative fine per year.[6] This

[3] The Dutch legislation is essentially the adoption of two European Union directives, the Insider Dealing Directive 89/592/EEC and its successor, the Market Abuse Directive 2003/6/EC.

[4] Therefore, we do not discuss insider trading regulations prior to this period. Fernandes and Ferreira (2009) document that Dutch insider trading regulations were altered in 1994 as well, which precedes our sample period.

[5] This also implies that there is no disclosure requirement if the overall value of transactions initiated by the insider does not reach €5,000 in a calendar year. However, in our sample, we find several transactions that insiders reported even though the value stayed below this threshold.

[6] We obtain these figures from the annual reports of the AFM. Both the number of investigations and the number of indictments depict a "U" shape during our sample period. Both figures peaked in 1999 (72 inspections and 13 indictments). Investigations dropped during 2002-2004, reaching the minimum (20) in 2004. The pattern is repeated with a lag of one year (showing that gathering evidence is time-consuming) for the number of indictments, which

means that neither the unconditional probability of an investigation taking place, nor the probability of an indictment conditional on being inspected is negligible.

3.2. Corporate governance regulation and anti-shareholder mechanisms in the Netherlands

Relating the informativeness of insider trades to elements of corporate governance is of particular interest on the Dutch stock market. In contrast with the US or the UK and similar to most countries in continental Europe, the Dutch model of corporate governance is stakeholder-oriented. It essentially aims at establishing a consensus among the company's stakeholders, in particular, employers and employees. Franks and Mayer's (2001) definition of an insider system fully fits the Dutch model: share ownership is highly concentrated, there are relatively few listed firms while takeover activity is rather limited (Cools and van Praag (2007), McCahery, Sautner and Starks (2009)).

We focus on the four most widely-used protective measures on the Dutch market: protective preference shares, priority shares, certificates and the structured regime[7]. It is common for Dutch firms to instate these anti-shareholder devices, all of which explicitly violate the one-share-one-vote principle. Protective *preference shares* – akin to poison pills – are the most widespread antitakeover device. Upon a takeover threat, management issues these securities to a friendly trust office or outside investor. The shares carry full voting rights and are sold at nominal value; however, the purchaser is only to pay 25% of the amount upfront. The size of the issue may reach up to 50%, or depending on the amendments in place, even 100% of the company's outstanding nominal capital. *Priority shares*, customarily sold to a friendly foundation, grant the bearer special voting privileges over matters such as merger approval, public offerings, the appointment of board members, charter amendments, and liquidation. These instruments are comparable to French or British "golden shares". Certificates are tradable *depositary receipts* carrying full cash flow rights but stripped of voting rights. They are issued in exchange for ordinary voting shares – the supervisory board has the authority to request such a transaction –, which are then deposited with the issuer of the certificates, the administration

decrease sharply during 2003-2005. We observe the minimum (2) in 2004. Numbers rise again from 2005 (2006 for indictments) to reach 58 (7) during 2007.

[7] The original Dutch expression *structuurregime* had several English translations. In legal texts and annual reports we have found the following: "statutory two-tier status", "structured regime", "structure regime", "two-tier structure", "dual-board structure", "structural regulations for large companies", "structural regime applicable to dual-board entities". The Tabaksblat Code uses "statutory two-tier status" and "statutory two-tier rules". In our study, we call this anti-shareholder provision structured regime as it is more than a two-tier structure, which is commonly used in Continental Europe, but does not include a substantial reallocation of shareholder powers to the supervisory board.

office. Through this process the legal ownership of the shares is transferred to the trust office which thus assumes all voting rights on the shares withdrawn and usually obtains the majority of the votes as a consequence. The regulations of Euronext Amsterdam permit companies to install at most two of the above security types. This constraint was lifted in 2007, after the end of our sample period.

The final anti-shareholder mechanism considered is an institutionalized restriction imposed on shareholder control by law, called a *structured regime*. Limited liability companies are legally obliged to adopt this scheme if their subscribed capital is in excess of 11.4 million EUR, they employ at least 100 employees and have a legally installed workers' council. The structured regime deprives shareholders of the majority of their tasks and powers, and reallocates them to the supervisory board. As a consequence, the powers of the supervisory board are extensive. Although the name suggests that supervisory board members act as outside directors and hence represent the best interest of shareholders and challenge management decisions, this has not been the case historically. Relations between the management board and the supervisory board tend to be quite cordial, also because members of the latter are often elected from main financiers, customers or business partners. A notable example of the absence of checks and balances between the management board and the supervisory board is the Ahold case, a total breakdown of corporate governance. (De Jong, DeJong, Mertens and Roosenboom (2007)). In a full structured regime, the following powers are transferred to the supervisory board: establishing the approval of annual accounts, election of management, and even election of the supervisory board itself (through co-optation). Moreover, the supervisory board may also overrule major decisions taken by the executive board.[8]

Prior empirical research has shown that the powerful anti-shareholder provisions in place at most Dutch firms have far-reaching effects on their financial value and policy. These effects are exacerbated even further as most Dutch companies use these devices cumulatively, thereby restricting shareholder control severely (Renneboog and Szilagyi (2007)). Empirical evidence suggests that anti-shareholder devices impact corporate policies and performance. De Jong, DeJong, Mertens and Wasley. (2005) find that shareholder control restrictions have considerable valuation effects. Specifically, both the full and the voluntary form of the structured regime are associated with lower firm values – measured by the market-to-book ratio – as are other anti-shareholder devices. Renneboog and Szilagyi (2007) provide empirical evidence that firms with a full structured regime in place pay lower dividends and do not smooth payments over time.

[8] The current law also specifies some exemptions from this two-tier scheme, most notably for firms with foreign ownership or international operations. In particular, companies which are majority-owned by foreign entities may adopt only a mitigated form of the regime. Most exempt companies choose to retain a weaker version of the regime, because its full abolition requires a statute amendment which the supervisory board can readily block (De Jong, et al. (2005)).

Given that (i) Dutch companies are reluctant to shift their governance practices, despite the proven adverse effect of structured regime and other anti-shareholder mechanisms on company value (De Jong et al. (2005)) and (ii) corporate governance mechanisms have been shown to impact firm value and financial policy, we conjecture that corporate governance devices have an impact also on abnormal return patterns around the events analyzed in this paper – i.e. insider trades and option exercises by insiders. The number of anti-shareholder mechanisms is an inverse proxy for shareholder power. It follows that, under the *monitoring hypothesis, we would expect to see more profitable insider transactions at firms with a high number of anti-shareholder mechanisms*. The *substitution hypothesis yields the opposite prediction: profits on insider transactions should be higher at firms with few or no anti-shareholder devices*.

3.3. Corporate governance changes in 2004

In 2004, there were two important modifications in corporate governance practices in the Netherlands (Groenewald (2005)). First, on January 1, the new Dutch Corporate Governance Code (Tabaksblat Code) came into effect.[9] The Code attempted to defuse one of the most commonly used anti-shareholder mechanisms by requiring that depositary receipt holders be granted voting rights at all times. It further encouraged shareholder participation by advising companies to enable proxy voting and facilitate shareholder communication. It also called for a more active role of institutional investors in the general meetings. Furthermore, the Code set caps on the number of supervisory board memberships assumed at other companies by executive board members and supervisory board members. The Code was enforced using a "comply of explain" approach.

The second change in corporate governance regulation came through the Structured Regime Reform Act, effective September 1, 2004. The Act primarily cut back on the authority of the supervisory board, but also increased shareholder power in other respects. It allowed shareholders and the workers' council to recommend candidates for supervisory board membership, prior to the nomination made by the supervisory board. Also the firm's annual accounts and the remuneration of the members of the two boards now had to be approved by the general meeting. Moreover, the Act specified that a general meeting of shareholders representing at least one-third of the issued capital may reject nominations for supervisory board members and dismiss the entire supervisory board with a majority vote. It also required prior shareholder approval for the transfer of the company's business to a third party, the initiation of a sustainable

[9] The "Tabaksblat" committee that drew up the Code was chaired by and named after the former Unilever CEO Morris Tabaksblat.

cooperation (e.g. a joint venture) with other firms and proposed transactions in the shares of companies if the transaction value is greater than or equal to one-third of the firm's own assets. Furthermore, the law explicitly stated the right of both shareholders and holders of depositary receipts to place resolutions on the agenda of general meetings, provided that they hold a stake of at least 1% or 50 million EUR in the company's shares. The Act obliged companies to give depositary receipt holders voting rights, except in the event of a hostile takeover bid.[10]

As both of these corporate governance changes are aimed at strengthening shareholder rights and reducing the impact of anti-shareholder mechanisms, we use the 2004 modifications as a quasi-natural experiment. Since the corporate governance changes increased shareholder power, they arguably diminished the ability of insiders to enjoy private benefits. Hence, if profitable insider trading and reaping private benefits of control are substitutes, we should observe an increase in the profitability of insider trading at firms that reduced the number of anti-shareholder mechanisms as required by the regulation. The next section lays out the empirical strategy and the data we use to capture this effect.

4. Data sources, descriptive statistics and methodology

4.1. Sample description

The primary information source for our sample is the public register of the Netherlands Authority for the Financial Markets (Autoriteit Financiële Markten, AFM). The sample comprises purchases, sales and stock option exercises from April 1999 to April 2007 of all insiders that have a reporting obligation, as defined in subsection 3.1. The register contains disclosed trades in stocks, options and warrants. For insider transactions, AFM publishes information on the company names, insiders' names, transaction dates, number of instruments traded, prices, security type, and transaction type. In the case of option exercises, if stocks are immediately sold after the exercise, the database also includes the sale price and the number of stocks sold.

The number of AFM disclosures in our initial database totals 15,527 for 134 companies. All trades in convertible securities, restricted share awards, stock appreciation right awards and warrant-related transactions are erased from the sample. We aggregate multiple insider purchases and sales of one insider taking place on the same day into a single transaction and, in a similar

[10] Thus, the Structured Regime Reform Act is not as radical as the Corporate Governance Code. The latter, however, is not legally enforceable.

fashion, aggregate option exercises by the same person on the same day into one observation. We drop entries containing typographical errors which could not be validated after searching through the firm's annual report and/or retrieving information from Datastream. We also delete transactions that took place within 40 days of the first quotation of the firm on Euronext Amsterdam as abnormal returns cannot be calculated.

We search the companies' annual reports to gather information on the role of the insider at the firm, various accounting data and anti-shareholder mechanisms in place. Information on companies' ownership structure has been gathered using publicly available information disclosed on the AFM website and companies' annual reports. We use Bureau van Dijk's AMADEUS database, to complement any missing data. Information on the characteristics of the exercised options, i.e. the grant date, vesting period, and expiration date are obtained from the annual reports.[11]

4.2. Descriptive statistics

Table 1 reports the summary statistics on all AFM-disclosed insider purchases, sales and option exercises performed by between April 1999 and April 2007. We separate option exercises and related sales from all other stock sales that are not linked to option exercises. Our intention is to isolate transactions that are less likely to be driven by liquidity motives, similarly to Cohen et al. (2011). Instead of using prior trading patterns, however, we utilize the information on the immediate sale versus partial or full retention of stocks acquired through option exercises in the AFM registry to identify sales that are more likely liquidity-motivated. In the remainder of the paper, we refer to option exercises *and related stock sales* as "option exercises", and *stock sales unrelated to option exercises* as "sales". We tabulate option exercises in Table 1 to show their overall magnitude and prevalence relative to sales. In the rest of the paper, however, we focus on purchases and sales only.

– Insert Table 1 here –

Panel A shows statistics on the full sample, whereas Panel B partitions transactions by year and by insider type. Insider purchases have the highest mean value, in contrast, they also have the lowest median value, suggesting considerable skewness of the distribution. The majority of the exercises occur between the vesting date and the expiration date (725 exercises or 62%). For this category the percentage of stocks sold after exercise is also the highest (90.74%).

[11] Any exercise that occurs within 30 days of the expiration (vesting) date is considered as an exercise performed at expiration (vesting). For part of the sample, the exact dates are unavailable and only the year of expiration (vesting) is known. In these cases, an exercise at expiration (vesting) is defined as any exercise that occurs in the year of expiration (vesting).

The mean (median) value of insider purchases peaked in 2004 (1999), while the largest mean (median) value for sales was calculated in 2000 (2006). For option exercises, we observe the highest mean (median) in 2000 (2007). Most transactions are performed by insiders who are neither members of the executive board nor of the supervisory board. Whereas the proportion of transactions for purchases and sales is approximately equal among the remaining three categories, the second-largest group for option exercises are, by far, members of the executive board (11%). Table 2 provides an overview of the anti-shareholder mechanisms used by firms in our sample.

– Insert Table 2 here –

4.3. Methodology

We use event study methodology to identify to the gains on insider purchases, sales, and option exercises. To define expected returns, we use the CAPM as a benchmark. The market return is defined as the Amsterdam Exchanges All-Share index. Since the transactions in the sample not only refer to companies listed in the AEX, but also to mid-cap and small-cap companies, this index is the best proxy for measuring market returns. Risk-free returns are based on the daily rolling interest rates on Dutch three-month zero discount bonds. The betas are monthly rolling betas with a 5-year moving average. To determine the significance of the AARs and CAARs, we use a simple t-test, as defined in e.g. Barber and Lyon (1997). Since the parametric test may be sensitive to extreme observations, we also compute the nonparametric Wilcoxon rank-sum test. Furthermore, given that we group the data in our univariate analysis according to some firm or insider characteristics and the resulting groups often contain quite few observations we also choose to use a bootstrap method to provide further validation for our t-tests. Under certain conditions, bootstrapped estimators attain a faster convergence to the true value than first-order asymptotic approximations and therefore provide refinements to hypothesis testing in small samples (Horowitz (2001)). Because power loss may be severe for tests at low significance levels, we follow the recommendations of Davidson and MacKinnon (2000) and run the bootstrap simulations with 3000 repetitions. To account for the correlation between CARs following trades by different insiders of the same firm we compute heteroskedasticity-robust standard errors clustered at the firm and the year level. Furthermore, we run regressions with firm fixed effects.

To identify the direction of causality between the profitability of insider transactions and the number of anti-shareholder devices employed by the firm, we use the 2004 changes in Dutch corporate governance regulations as a quasi-natural experiment. As described in subsection 3.3., Dutch legislators and the Committee on Corporate Governance pushed to mitigate the impact of

anti-shareholder devices. Thus, sample firms with many anti-shareholder devices were forced to cancel some of them (mostly depositary receipts and the structured regime). This lead to a decrease in the differences between firms in the level of shareholder-orientation and hence also in the level of private benefits enjoyed by insiders.

To investigate this, we adopt a differences-in-differences (DD) strategy. The goal is to compare the difference between the profitability of insider trading in firms that were forced to change their governance rules, i.e. decrease the number of anti-shareholder mechanisms, (changers, treatment group) to those that were not (non-changers, control group), before versus after 2004. Because firms may endogenously and heterogeneously react to the change in legislation, the definition of the treatment group should not use any information on how firms' governance *actually* changed post-2004. Rather, we use an *ex-ante* assessment of which firms looked likely to be in conflict with the new rules. We call these firms, which form our treatment group, "ex-ante changers". To this group we allocate firms that either had three anti-shareholder mechanisms (the maximum number), or employed depositary certificates in 2004. The former type of firms were likely to comply with the spirit of the law (that governance structures should be more shareholder-friendly), whereas the latter type had to comply with the letter of the law (prohibiting the use of depositary receipts). All other firms are in the control group, the group of "ex-ante non-changers". We construct a dummy variable for transactions that took place after 2004 and include it, as well as its interaction with the group dummy, in the regressions of Tables 6 and 7.[12,13]

We report three types of regressions. Our baseline OLS specification can be written as

$$CAR_{ist}[0,40] = \beta_0 + \beta_1 ASI_{st} + \beta_2 BH_{st} + X'_{ist}\gamma + \varepsilon_{ist}\,, \tag{1}$$

where *ASI* is the anti-shareholder index, a count variable of the number of anti-shareholder provisions in place, *BH* contains binary variables indicating the type of the largest blockholder and *X* contains our control variables. The controls we use are size (Seyhun (1986)), profitability, leverage, and the role of the insider at the firm (Seyhun (1986, 1998) and Lin and Howe (1990)). In order to exploit the regulatory change in 2004, we also employ specifications with firm fixed effects, formulated as

$$CAR_{ist}[0,40] = \alpha_s + \beta_0 + \beta_1 ASI_{st} + \varepsilon_{ist}\,. \tag{2}$$

[12] In these specifications, we exclude the economic trend dummies to avoid multicollinearity.

[13] Repeating the estimation process using 2005 as the intervention year does not produce significant results. We conclude that firms did not deliberately delay changing their governance structures after the law became effective in 2004.

This has two advantages over the OLS setup. First, in these regressions with firm FE, β_1 is identified only by transactions at firms that alter their governance structures. Second, although we employ numerous control variables, firm FE capture effects beyond size, profitability, leverage or blockholder structure.

Finally, the differences-in-differences regressions take the form

$$CAR_{ist}[0,40] = \beta_0 + \beta_1 CHG_{st} + \beta_2 BH_{st} + \beta_3 POST2004 + \beta_4 CHG_{st} \times POST2004 + X'_{is}\gamma + \varepsilon_{ist}. \quad (3)$$

POST2004 indicates any level effect, (i.e. common time trends) that influenced the profitability of insider trading at all firms following 2004. It captures, for instance, the regulatory change concerning the disclosure of insider trades, analyzed in detail by Degryse et al. (2009). *CHG×POST2004* is our key dependent variable: it shows the effect of anti-shareholder mechanisms on the profitability of insider trading in the period following the 2004 corporate governance changes. If the number of anti-shareholder mechanisms indeed influences insider trading profits, then we should observe a positive (negative) coefficient on the interaction term in the regression of CARs following purchases (sales). Thus, if corporate governance rules have a causal effect on insider trading profits, β_4 should be significantly different from zero.

To justify our empirical setup, we proceed by describing how the anti-shareholder index evolved over time in our two groups. Figure 1 shows the number of anti-shareholder mechanisms in the two groups over time, using the equally weighted averages from the purchase subsample. There is a marked difference between the averages of ex-ante changers and non-changers at the beginning of the sample period. However, as expected, the wedge between the two groups is reduced significantly by 2005. In Table 3 we present the average number of anti-shareholder mechanisms in the two groups over time in the two subsamples based on transaction type (purchases and sales). Since in the regressions our observations are transactions, we tabulate both equally-weighted averages and averages weighted by the number of transactions, to account for the higher number of some firms' transactions in the sample. Furthermore, we tabulate the number of anti-shareholder mechanisms for firms that *actually* changed their governance structures in 2004 (termed "actual changers" and "actual non-changers"), to show that our ex-ante definition is highly correlated with the actual outcome. For example, the yearly average values of the anti-shareholder index in the purchase subsample for ex-ante changers (shown in Figure 1) and actual changers have a correlation coefficient in excess of 95%. The fluctuation in the averages is due to firms' attrition and re-appearance: not all firms have transactions in all our sample years. During our sample period, no single firm increased the number of anti-shareholder

mechanisms in place. They either retained the existing anti-shareholder devices or abolished some of them from one year to the next.

- Insert Table 3 here –

- Insert Figure 1 here -

A possible source of bias to our empirical strategy is if firms that would have had to alter their governance structures chose instead to delist from the stock exchange. We obtain data on delistings from Euronext Amsterdam. The average number of delistings during 2003-2005 is lower (not higher) than the average taken over our entire sample period of 1999-2007. Furthermore, during 2003-2005 none of our sample firms initiated a voluntary delisting and more than 89% of delistings occurred due to M&A or bankruptcy. We conclude that our sample firms did not attempt to sidestep the imposed changes in governance rules by delisting from the stock exchange.

5. Results

We first conduct tests on the full sample of insider purchases and sales, to analyze whether and to what extent insiders are able to gain from their transactions. The results are exhibited in Table 4.

– Insert Table 4 here –

Purchases are followed by a significant abnormal stock price appreciation of approximately 3.5%, whereas the stock price depreciates only 0.44% abnormally after a stock sale. Calculating the abnormal returns following the supposed announcement date (day 5), we find significant CARs of 2.67% and -1.14% for purchases and sales, respectively. As expected, purchases have higher information content than sales. Similarly to Ravina and Sapienza (2010), we check that these abnormal returns are not an artifact of insiders purchasing during periods of stock price appreciation or selling during stock price declines. Purchases are preceded by a significant share price decline of -4.55% (not annualized) over 40 days, whereas we discern a notable price run-up of 5.53% over the same period before sales. The significance of the reported results is confirmed by bootstrapped t-statistics. The results on abnormal stock performance prior to insider transactions are also consistent with portfolio rebalancing decisions after portfolio proportions get too far away from optimal levels. Thus, in the remainder of the paper we focus solely on abnormal returns following insider transactions.

We scrutinize how anti-shareholder mechanisms influence the CARs following insider purchases and sales. Table 5 presents CARs following purchases grouped by the presence of the four main anti-shareholder mechanisms. A maximum of three measures may be present because

firms are forbidden to employ preference shares, priority shares, and depositary receipts simultaneously.

– Insert Table 5 here –

Panel A of Table 5 examines the impact of anti-shareholder mechanisms following purchases. Results on the disparity between firms with and without preference shares suggest that purchases are followed by larger positive abnormal returns at firms with preference shares. When we split our sample based on the use of priority shares, we find considerably smaller abnormal movements in the share price at companies which use these defensive securities. Following purchases, CARs over a period of two months subsequent to the transaction (day 0) or announcement (day 5) are approximately two times larger at firms with no priority shares, providing further evidence of more accurate timing by insiders. As post-transaction share price movements are more pronounced at firms with no priority shares, the data support the substitution hypothesis. Purchases are followed by higher abnormal returns at firms where insiders are unable to curtail shareholder rights as there are no priority shares which would allow them to decide on e.g. the composition of the supervisory board and the executive board by themselves. Conversely, CARs following purchases are lower at firms where insiders can effectively bypass shareholders in numerous decisions and can thus use the company's assets for goals other than maximizing shareholder value.

Partitioning the observations according to the presence of the structured regime yields similar results: post-event abnormal share price movements are substantially larger in absolute value if shareholder power is not diminished by the adoption of the structured regime. During the 40 days following the date of the purchase, the abnormal rise in the stock price is in excess of 7% for firms without the structured regime as opposed to 2.77% at firms that apply this anti-shareholder mechanism. CARs following the event as well as the announcement are similar in magnitude for the subsamples of firms with and without depositary receipts, therefore, based on the univariate analysis, we cannot clearly support any of the hypotheses regarding the impact of corporate governance.[14]

Finally, we examine the disparities between trades at firms employing three anti-shareholder mechanisms (the regulatory maximum) and at those that have no such measures in place. The results thus far suggest that the absence of anti-shareholder mechanisms usually magnifies the absolute values of CARs following insider purchases. This pattern of CARs, albeit somewhat mixed, provides more support substitution hypothesis, and less for the monitoring hypothesis. We now perform identical tests on sales (Table 5, Panel B).

[14] Nonetheless, we note that the reaction appears to be delayed as significantly positive abnormal returns are realized over the 5 days after the purchase at companies without depositary receipts, whereas a CAR of similar magnitude is observed only after the announcement of the trade at firms that have this defense mechanism in place.

The first part of Panel B shows CARs around insider sales at firms with and without preference shares. The share price decline following sales is substantially higher, irrespective of whether the CARs are measured from the transaction date [0,40] or the supposed reporting date [5,40]. The difference is significant at the 1% level for the [0,40] event window. Moreover, in economic terms, it amounts to a (non-annualized) abnormal return of 5%. We observe similar patterns for the structured regime and priority shares. For both categories, we see that CARs following sales are again distinct in the two subgroups: they are negative for companies that employ no priority shares but positive for their peers that do. Partitioning the sample based on the structured regime produces largely similar results. Lastly, when splitting the sample based on the presence of depositary receipts, we find that CARs after sales are more negative at companies that do not use this instrument to lessen shareholder rights. The difference is economically meaningful, and significant at the 1% level. Hence, these univariate results for the subsample of stock sales are in favor of the substitution hypothesis.

Finally, we investigate the CARs at firms with an intensive use of anti-shareholder mechanisms and those without. Consistent with results on the individual anti-shareholder mechanisms, the abnormal share price depreciation subsequent to (the announcement of) sales differs statistically significantly across groups: while CARs are positive following sales at firms with all possible anti-shareholder mechanisms, they are negative at their counterparts that refrain from installing such devices. The economic magnitude of the difference is approximately 4%.

Taken together, these results suggest that the lack of anti-shareholder mechanisms is, in most cases, associated with a higher absolute magnitude of CARs following insiders' transactions, rather than a lower one. Even though these patterns appear fairly robust in a univariate setting, given the correlation between anti-shareholder mechanisms and other firm characteristics such as size, profitability or ownership structure, as well as the association amongst the anti-shareholder mechanisms themselves, we further analyze the role of anti-shareholder mechanisms in a multivariate framework. We use the post-transaction CARs a dependent variable. We consider event windows of forty days. In Tables 6 and 7 we regress the CAR[0,40] for insider purchases and sales, respectively, on an index counting the number of anti-shareholder devices at the firm (ranging from 0 to 3) and numerous controls. The first column shows a regression with firm fixed effects (FE), so that the coefficient on the anti-shareholder index is identified only by firms that change the number of anti-shareholder mechanisms. In the second column we regress the CAR following purchases on an extensive set of controls. These include company size, profitability, leverage (all three measured in the business year prior to the transaction), the firm's age, the position of the insider at the firm, the identity of the largest blockholder, and dummy variables capturing the macroeconomic trend. The third column contains a specification where we keep the controls and add firm FE. The

fourth column exhibits differences-in-differences estimates, using the 2004 changes in corporate governance as an exogenous shock to the number of anti-shareholder mechanisms. Instead of the anti-shareholder index, we add a dummy for ex-ante switchers, one for trades taking place after 2004, and their interaction term to the regressions.

– Insert Table 6 here –

Departing from the full sample average CAR[0,40] of 3.46%, our within-firm specifications show that when the number of anti-shareholder mechanisms was reduced at a firm, the CAR becomes significantly higher, on average by 2.21% for each anti-shareholder mechanism. Although the interpretation is different, the OLS regression with controls produces a similar estimate both qualitatively and quantitatively (-2.39%). When including both controls and firm FE, both the statistical and the economic significance of the coefficient increases (-3.55%, $p<0.01$). From these regressions we infer that a high number of anti-shareholder mechanisms leads to less profitable insider purchasing, both in the cross-section and in the time-series. DD estimates in column 4 buttress this finding: insiders of firms that ex ante were likely to alter their governance structures in 2004 traded significantly more profitably after 2004. The effect is 5.29%, considerably higher than the full sample average. Thus, the number of anti-shareholder mechanisms is not merely correlated with the returns to insider trading, but we also have suggestive evidence to argue the direction of causality. From our regression estimates, we infer that changes to corporate governance rules affected the profitability of insider purchases. DD estimates and the use of firm FE suggest that the direction of causality was not the opposite, nor are the correlations due simply to unobserved heterogeneity of firms. Despite using CARs as a dependent variable, the coefficients in all four regressions are significant at least at the 5% level.

Coefficients on other covariates indicate that insider type has no significant effect on the extent to which the share price movements favor the insider. Regarding blockholder monitoring, as our base category contains widely-held firms (with no entity owning 5% or more), we also conclude that CARs following purchases are significantly higher if either the government or an industrial or commercial company holds a substantial stake in the firm. The latter finding is difficult to square with the idea of blockholder monitoring, hence it goes against the monitoring hypothesis. Firm age shows no significant relation with the CARs. We can therefore reject the conjecture that the difference in governance structures is due solely to firm age, or to the renown on the Dutch or the international market. Abnormal share price patterns after insider purchases are not influenced by the overall trend in the economy.[15,16]

[15] Results are unaffected by exchanging the economic trend variables with year fixed effects.

[16] We infer that the overall situation of the economy is irrelevant to the abnormal returns after insider trades. An alternative explanation could be that since 2003 the effectiveness of timing by insiders declined. Most notably,

Table 7 shows results from the same four regression specifications on the 40-day CAR following insider sales. The simple OLS regression in column 2 suggests that following insider sales, CAR[0,40] is positively related to the number of anti-shareholder mechanisms at the firm, but this result is devoid of statistical significance. In the specification with firm FE (column 1), however, the relation becomes statistically significant at the 1% level. After including control variables the relation is still significant at the 1% level with an even higher coefficient (5.86). These results suggest that whenever a firm reduced the number of anti-shareholder mechanisms, CARs following insider sales become more negative. Estimates from the DD regression suggest that sales by insiders of firms with a high ex-ante likelihood of being affected by the 2004 governance reforms were more profitable following the 2004 changes. Hence, the (ex-ante likely) reduction in the number of anti-shareholder mechanisms led to an increase in the profitability of insider sales, providing further corroboration that the direction of causality goes from governance rules to insider trading profits. In sum, the regression results on the subsample of sales provide further support for the substitution hypothesis.

– Insert Table 7 here –

Our results on the abnormal returns following sales are mostly significant even though the smaller size of post-sales CARs renders it more difficult to accurately identify drivers of cross-sectional or time-series variation. The lower accuracy is reflected also in the substantially lower goodness-of-fit values. Further empirical evidence of this pattern is provided by the coefficients on the control variables, of which only three appear to be significant. Firstly, CARs are more negative after stock sales by CEOs, which suggests that chief executives have superior information about the firm's prospects. Secondly, CARs are less negative for insider sales at large firms, and thirdly, they are also less negative at firms with high leverage. Although Tables 6 and 7 report only conventional t-statistics, our results are virtually unaltered when using t-statistics based on bootstrapped standard errors.

Overall, the regression models qualify the results of our univariate analysis and suggest that at firms with a lower number of anti-shareholder mechanisms insider purchases entail more positive CARs, whereas sales and option exercises at such firms entail more negative CARs. Moreover, we reveal that the presence of blockholders is associated with higher abnormal returns following insider trades, not lower. In line with our expectations and previous literature, results are marked for stock purchases, which are most likely to be based on private information, and somewhat less pronounced for sales. Hence, the findings of our multivariate analysis substantiate the substitution hypothesis and go against the monitoring hypothesis.

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changes to insider trading regulations and disclosure rules in 2002 and 2006, respectively, may have had an impact on timing. However, when using year fixed effects, as discussed in footnote 14, we find no evidence of this, furthermore, *a priori*, we would expect these changes to have had an impact also on sales.

5.1. Alternative explanations

To eliminate alternative explanations underlying our results, we consider four possible sources of spurious correlation. First, we examine whether the detected relationship between insider trading and corporate governance is driven by transactions in *months of frequent trading*, i.e. when the majority of insiders was purchasing or selling the stock. We define a high net purchase month as any month in which purchases outnumbered sales by ten or more. High net sale months are defined similarly. We then re-estimate the regressions shown in Tables 6 and 7, and add the corresponding binary variable for high net purchase months or high net sale months to the regressions that feature control variables. Compared to the baseline results reported in the fourth and fifth columns of Tables 6 and 7 this procedure yields quantitatively similar coefficient estimates and identical significance levels (these results are untabulated). Therefore, we are reassured that that our main results hold equally in periods of intensive insider purchasing and selling.

Second, our results indicate that legal insider trading and option exercising is less profitable at firms with a higher number of anti-shareholder mechanisms. However, insiders at firms with weak shareholder orientation may choose a different approach and trade more *frequently*, thereby making up for the lower of profitability of the individual trades. We explicitly test for this explanation by examining the average number of trades executed per year. We then compare the averages for all three types of transactions across different levels of the anti-shareholder index. For all three transaction types we find that the number of transactions per year does not differ significantly in the groups created based on the anti-shareholder index. An inherent problem with this approach is that firms that changed their governance structures have a different number of anti-shareholder mechanisms, and thus belong to two different groups in different sample years. To address this problem, we repeat the analysis for ex-ante switchers and non-switchers. Again, there is no evidence of differences in trading frequencies across groups.

Third, a possible mechanism that may explain the difference between the CARs following insider transactions is that firms with strong corporate governance are more *transparent,* their stock prices are more informative (Ferreira and Laux (2007)). Thus, shareholders have more information based on which they can adjust their valuation of the stock price. It follows that insider transactions do not carry much additional information. By contrast, firms with weak governance are informationally opaque, therefore insider transactions should be more informative. If this were the case, we would expect to see more sizable CARs after insider purchases at firms with weak corporate governance (high number of anti-shareholder mechanisms) than at firms with strong governance (few or no anti-shareholder mechanisms).

However, we observe exactly the opposite in our data: the number of anti-shareholder mechanisms is *negatively* related to CARs following purchases, not positively (and positively, not negatively to the CARs following sales).

Fourth, *liquidity* of the firm's stock may be a further concern regarding the interpretation of our results. Investors may be reluctant to hold and trade in stocks of firms with a high number of anti-shareholder mechanisms. If this were the case, the anti-shareholder index used in our regressions would not only proxy for the strength of corporate governance at the firm level, but also for the liquidity of the stock. To distinguish between our explanation and one based on liquidity, we consider the turnover of the stock over the one-year period preceding the insider transaction, expressed in percentage terms. We include this variable in the regressions in the fourth (OLS with controls) and fifth (DD with controls) columns of Tables 6 and 7. Our results (untabulated) indicate that although turnover is significantly correlated with post-event CARs in the case of purchases, coefficient estimates and significance levels for the anti-shareholder index are unchanged by the inclusion of this control variable.

6. Estimating the value of private benefits

In Section 5, we have shown that CARs are higher after insider purchases and lower following sales at firms that employ fewer anti-shareholder mechanisms or employ none at all. We argue in our substitution hypothesis that the reason underlying this pattern is that insiders of firms protected by anti-shareholder mechanisms enjoy substantial private benefits of control. The empirical support this hypothesis receives in our dataset suggests that these benefits of entrenchment, both monetary and nonmonetary, may outweigh the prospective gains from insider trading. Therefore, CARs following insider transactions will favor the insider to a lesser extent at firms where they are ensured a powerful position owing to anti-shareholder mechanisms. However, at corporations where shareholder rights are not suppressed and the degree of entrenchment is thus small, they may resort to legal insider trading to still exploit their position. In line with previous literature, we have established that CARs have the largest absolute value following insider purchases as sales may take place for liquidity and other reasons.

Hence, the value of an anti-shareholder mechanism can be approximated by the coefficient estimates on the anti-shareholder index in our regressions of CAR[0,40] following insider purchases, as these express the average incremental gains to insider trading at companies

that have one anti-shareholder mechanism fewer.[17] We base our estimates on the coefficient in the column 2 of Table 6, although point estimates are similar across specifications. The hypothetical increment in profits due to the change in CARs is calculated as $|\beta|pq$, where p is the observed market price of the shares on the day the transaction took place, q is the number of shares purchased and β is the regression coefficient on the anti-shareholder index in the regression of CAR[0,40]. Because abolishing one anti-shareholder mechanism at a firm would, on average, lead to an increment in insider trading profits, we interpret these profits as the *value* of the anti-shareholder mechanism. Alternatively, if the firm had one anti-shareholder mechanism more, insiders would be able to consume *more* private benefits of control and would therefore devote *less* attention to their trades in the company's stock. Our regressions predict that this would shrink their profits from insider trading by $|\beta|pq$. Finally, we take the average of the estimates for the individual transactions. When performing the estimation for the subsample of stock purchases, this procedure yields an annual average value of €15,511, adjusted for inflation, expressed in 2007 Euros. We interpret this as the average value of entrenchment that is due to one anti-shareholder mechanism.

We underline that this is a rather conservative estimate and that it refers to the value of one anti-shareholder mechanism. As seen in Table 2 the majority of our sample firms employs two or more anti-shareholder mechanisms. This creates a greater degree of entrenchment which, according to our estimation procedure, would double or treble the value of private benefits. Moreover, our estimate is based on *single* transactions of *individual* insiders. Insiders can repeatedly trade in the firm's stock, which suggests that the longer the anti-shareholder mechanisms remain installed, the more valuable they are. Furthermore, an insider may purchase (and sell company) stock frequently within the span of one (business) year. Lastly, insiders of the same firm collectively enjoy benefits of control stemming from entrenchment, therefore one could also valuate these benefits as the sum of incremental gains from insider trading realized by all insiders of a firm, or, at the very least the CEO and the board of directors. These considerations underscore that the approximation of the value of entrenchment presented in this paper renders a conservative estimate, which is a lower bound for the value of entrenchment.

We therefore repeat the estimation using data on the actual transactions and number of anti-shareholder mechanisms for each firm-year. Thereafter, we sum up the estimated entrenchment values during our sample period for each firm, explicitly taking into account that not every firm had each transaction type each year (i.e. for some years the value is zero), as

[17] By using the number of anti-shareholder mechanisms, we proxy for the value of the private benefits as there is no one-to-one relation between the consumption of private benefits and the reduction of insider trading. As we have argued before, they are not perfect substitutes. If they were, in fact, imperfect substitutes, our estimation procedure would understate the true value of entrenchment.

mentioned on p.18. The average of the firm-level estimates, using the subsample of purchase transactions is €244,975.[18] As this value is moderate, we confirm that insider trading profits and other private benefits are indeed *imperfect* substitutes.

There are two caveats to this interpretation. The first is that these results are predicated on the assumption that the relationship between the number of anti-shareholder mechanisms and the CARs following insider purchases is linear. As our dependent variable is essentially a residual, including higher-order terms may be demanding of the data, or lead us to overfit the regressions in-sample. The second caveat is that if substitution between profitable insider trading and private benefits of control ceased after the 2004 corporate governance changes, then we should not use data from 2005 onwards to estimate the magnitude of private benefits. The DD specification in the fourth column of Table 6 confirms that regression coefficients were higher for the period 1999-2004, therefore, our estimates on the value of an anti-shareholder mechanism to one insider would also be higher. Once again, these results underline the conservative nature of our estimation procedure and that our calculations are a lower bound on the value of anti-shareholder mechanisms.

7. Conclusion

Insiders of publicly listed firms possess more information about the company than outside shareholders. This informational advantage can be converted into profits through insider trading, illegal or legal. This paper studies insider trading, and establishes its connection to two aspects of corporate governance: governance rules (as measured by anti-shareholder mechanisms) and blockholder concentration. We examine a sample of insider trades at listed firms in the Netherlands, a financial market where shareholder rights are significantly restrained through several anti-shareholder mechanisms. The most widely used anti-shareholder devices are the structured regime, priority shares, preference shares, and depositary receipts. The paper contributes to the existent literature on insider trading and corporate governance by alleviating concerns of endogeneity and addressing the causal relationship between governance rules and insider trading profits. To accomplish this, we adopt a differences-in-differences approach which

[18] This figure is calculated as $\sum_{i=1}^{n}\frac{1}{n}\sum_{t=1999}^{2007}\sum_{j=1}^{m}|\beta|p_{i,t,j}q_{i,t,j}a_{i,t}$, where β is the regression coefficient of the anti-shareholder index in the regression of the CAR[0,40] following insider purchases, from Table 6, column 4, p is the actual price at which the transaction was executed, q is the number of securities involved in the transaction, a is the number of anti-shareholder devices employed by the firm in that year, i indexes the firm, t indexes the year and j indexes the transaction in a given firm-year. The total number of firms in a subsample (in this case, purchases) is denoted by n, and the number of transactions (purchases) at a firm in a year is m.

uses the 2004 changes in Dutch corporate governance regulations as quasi-natural experiment which shifts corporate governance rules.

We shed new light on the interrelationship between insider trading and corporate governance by assessing how anti-shareholder mechanisms such as preference shares, priority shares, depositary receipts, and the structured regime influence abnormal stock price patterns following insider trading. We test two hypotheses, firstly, the monitoring hypothesis, which asserts that the absence of anti-shareholder devices leads to greater shareholder awareness, which curtails insider trading. Based on this argument, insider trading should be more profitable at companies employing many anti-shareholder mechanisms. The alternative, the substitution hypothesis posits that private benefits of control owed to anti-shareholder mechanisms are larger than potential profits to insider trading. Therefore, insiders are likely to seek trading profits if they cannot exploit private benefits, implying larger profits to insider trading at firms with fewer anti-shareholder devices.

Our results show that insiders, on average, earn a cumulative abnormal return of 3.46% following purchases, however, the price does not decline significantly following stock sales. We provide compelling evidence that the absolute value of abnormal returns following insider transactions is higher at firms that do not limit shareholder rights by employing anti-shareholder mechanisms. The findings are somewhat stronger for insider purchases, consistent with the notion supported by previous empirical work that sales may be motivated by liquidity or diversification motives. Furthermore, we establish the direction of causality using a DD framework. As firms did away with shareholder-unfriendly governance structures in 2004, profits to insider purchases, as well as sales, at these firms did indeed increase. These results are in the favor of our substitution hypothesis and suggest that corporate insiders are more inclined to make profits on trades in the shares of their company if they do not (or to a lesser extent) enjoy private benefits stemming from weak shareholder rights. From this, we infer that private benefits of control outweigh the returns to insider trading and option exercising if management is heavily entrenched. However, if anti-shareholder devices do not impede shareholder participation in company decisions, it is more difficult for insiders to attain private benefits, and will substitute them with profitable insider trading. The most likely reason our results differ from those of previous studies is that the variation in shareholder rights during our sample period, especially until 2004, is much larger in the Netherlands than in the US or the UK, simply because the range extends much further at the end of low shareholder rights. Indeed, even in the early ‘90s some US shareholders were shocked to discover that they are completely powerless at their Dutch investee firms, with voting with their feet being their only option.

Finally, the substitution effect uncovered in this paper allows for the measurement of the monetary value of entrenchment provided by anti-shareholder mechanisms. Using an extensive

set of control variables we find that the relationship between anti-shareholder devices and profits to insider purchases remains significant both statistically and economically. Based on our regression analysis, our conservative estimate for the lower bound of private benefits is approximately €15,000 for share purchases per year, per anti-shareholder mechanism. Considering the number of insider purchases and anti-shareholder mechanisms at our sample firms, the average company's insiders enjoy private benefits worth approximately €245,000. As these figures, calculated based on the assumption of perfect substitution, are moderate, we conclude that insider trading profits and private benefits of control are imperfect substitutes.

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Figure 1: Average number of anti-shareholder mechanisms employed by changers and non-changers in the purchase subsample

This figure shows the number of anti-shareholder mechanisms at ex-ante changers and non-changers. *Ex-ante changers* are firms that, ex ante, looked likely to change their governance structures, because they either had 3 anti-shareholder mechanisms in place or employed depositary receipts in 2004. *Ex-ante non-changers* are firms for which neither of these conditions is satisfied. Numbers shown are equally weighted averages. Data run from 1999 to 2007 and are based on our purchase subsample, so that a firm's anti-shareholder index is considered in the average in a given year if a legal insider purchase took place at that firm in that year. The thick gray line represents the event of the regulatory change.

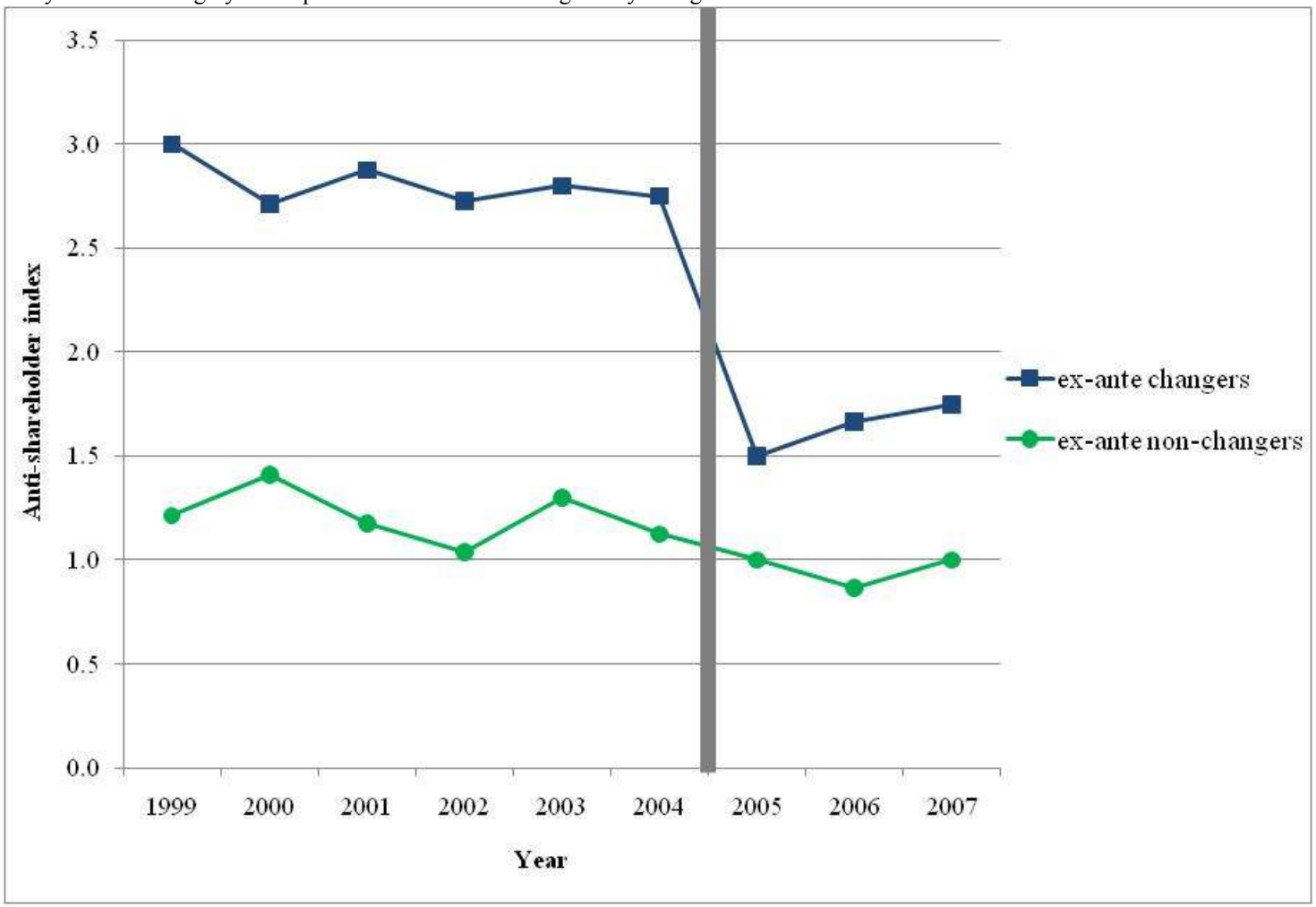

Table 1: Descriptive statistics

Panel A reports statistics for the full sample. The sample of option exercises is partitioned according to whether the exercise occurred early or at expiration and according to whether the exercise occurred on or after the vesting date. An early exercise is defined as an exercise with more than 30 days to expiration, if the exact expiration date is known. If the exact date is unknown and only the year of expiration (vesting) is available, an exercise at expiration (vesting) is defined as any exercise that occurs in the year of expiration (vesting). Of the 1,392 option exercises, 211 (226) do not report an exact expiration (vesting) date. In Panel A the word "transaction" refers to option exercises, insider sales and insider purchases. Mean value of options exercised is measured as number of options exercised times the stock's closing price on the exercise date. Transaction values are quoted in Euros. *Panel B* reports statistics for the sample partitioned by the type of insider performing the transaction. The 4 categories of insiders are CEOs, executive board members excluding the CEO, supervisory board and other insiders. Other insiders include large shareholders, the management board and supervisory board of companies in which the company has an interest of at least 10%, partners and first degree relatives of CEOs, executive board members and supervisory board members that live in the same household, first degree relatives of CEOs, executive board members and supervisory board members that do not live in the same household, but have an equity stake of at least 5% in the company and members of the workers' council. Data are from the period 1999-2007.

Panel A: Summary statistics for the full sample of insider sales, purchases and option exercises

	Number of transactions	Number of firms	Number of insiders	Transaction value		% of stocks sold		Years prior to expiration	
				mean	median	mean	median	mean	median
Insider purchases	663	90	339	595,437	20,113				
Insider sales	739	86	349	438,618	63,000				
Option exercises	1,392	79	733	169,358	47,120	86.45	100	2.17	1.83
Exercised on vesting date	228	35	156	196,276	100,561	87.91	100	3.88	3.75
Exercised before expiration and after vesting date	725	59	448	175,320	47,412	90.74	100	2.22	1.83
Exercised at expiration	220	27	143	110,609	24,547	84.55	100	-	-

Panel B: Summary statistics by calendar years and insider type

	Number of purchases	Number of sales	Number of option exercises	Value of purchases		Value of sales		Value of options exercised		Option exercises			
				mean	median	mean	median	mean	median	% of stocks sold		Years prior to expiration	
										mean	median	mean	median
CEOs	115	70	44	588,270	54,462	1,017,132	122,723	385,704	64,501	82.03	100	1.32	0.42
Executive Board members	98	88	148	358,442	44,482	517,752	104,175	304,027	64,956	78.54	100	1.70	1.25
Supervisory Board members	113	61	26	519,845	16,732	756,096	269,300	462,570	137,230	84.62	100	2.02	1.46
Other insiders	337	520	1,174	692,148	13,954	310,106	53,768	135,663	44,487	87.64	100	2.25	1.83

Table 2: Descriptive statistics and correlations for anti-shareholder mechanisms

This table shows transactions in the sample by the number of anti-shareholder mechanisms in place at the firm

	Number of purchases	Number of sales
None	95	92
Structured regime only	96	114
Preference shares only	79	145
Priority shares only	16	7
Depositary receipts only	1	0
Structured regime and preference shares	122	75
Structured regime and priority shares	17	6
Structured regime and depositary receipts	4	0
Preference shares and priority shares	22	46
Preference shares and depositary receipts	30	49
Priority shares and depositary receipts	24	1
Three anti-shareholder mechanisms	157	204

Table 3: Average number of anti-shareholder mechanisms in shifting and non-shifting firms.

This table shows the average number of anti-shareholder mechanisms in each year for different groups of firms. *Actual changers* are firms that changed their governance structures and abandoned some anti-shareholder mechanisms following the 2004 changes in legislation. *Actual non-changers* are firms that did not. *Ex-ante changers* are firms that, ex ante, looked likely to change their governance structures, because they either had 3 anti-shareholder mechanisms in place or employed depositary receipts in 2004. *Ex-ante non-changers* are firms for which neither of these conditions is satisfied. The analysis is performed separately for insider sales and purchases. These categories are not exclusive. In Panel A we tabulate a simple average of the number of anti-shareholder mechanisms in each category-year. Panel B contains weighted averages with the number of transactions in the given year (purchases or sales) as weights.

Panel A: Equally weighted

Year	Purchases				Sales			
	actual non-changers (n = 70)	actual changers (n = 19)	ex-ante non-changers (n = 62)	ex-ante changers (n = 27)	actual non-changers (n = 67)	actual changers (n = 19)	ex-ante non-changers (n = 61)	ex-ante changers (n = 25)
1999	1.40	2.60	1.21	3.00	1.55	2.60	1.28	3.14
2000	1.63	2.49	1.41	2.71	1.71	2.50	1.26	2.81
2001	1.60	2.67	1.17	2.88	1.48	2.45	1.06	2.86
2002	1.28	2.20	1.04	2.73	1.50	2.33	1.18	2.78
2003	1.67	2.33	1.30	2.80	1.39	3.00	0.93	3.00
2004	1.44	2.33	1.13	2.75	1.92	1.88	1.38	2.86
2005	1.17	1.20	1.00	1.50	1.57	1.71	1.30	2.17
2006	0.93	1.56	0.87	1.67	1.08	1.60	0.93	2.13
2007	2.50	1.00	1.00	1.75	1.62	0.91	1.19	1.50

Table 3 – continued

Panel B: Weighted by the number of transactions in a given year								
Year	Purchases				Sales			
	actual non-changers (n = 70)	actual changers (n = 19)	ex-ante non-changers (n = 62)	ex-ante changers (n = 27)	actual non-changers (n = 67)	actual changers (n = 19)	ex-ante non-changers (n = 61)	ex-ante changers (n = 25)
1999	1.41	2.72	1.33	3.00	1.74	2.50	1.34	3.05
2000	1.76	2.37	1.46	2.53	1.13	2.41	0.81	2.66
2001	1.67	2.67	1.29	2.83	1.40	2.67	0.97	2.97
2002	1.16	2.37	1.07	2.83	1.96	2.52	1.22	3.24
2003	1.29	2.18	1.21	2.67	1.85	3.00	0.86	3.00
2004	1.83	2.14	0.80	2.66	1.63	2.41	1.19	2.97
2005	0.91	1.00	0.69	1.50	1.82	1.75	1.23	2.55
2006	0.95	1.68	0.87	1.77	0.88	1.52	0.87	1.95
2007	2.33	1.06	1.00	1.53	1.71	0.93	1.35	1.39

Table 4: Abnormal returns and cumulative abnormal returns around insider purchases and sales

This table reports the average abnormal returns around insider purchases, insider sales and option exercises for the full sample of insider purchases and sales reported to the AFM between April 1999 and April 2007. Abnormal returns are estimated with the CAPM, using the Amsterdam Exchanges All-Share Index as market index. Panel A shows the daily average abnormal returns from day 0 (the day of the trade) to day 10. Panel B reports the cumulative average abnormal returns for 6 windows around the event date. Day 5 is assumed to be the announcement date and CAR [0,1] covers both the transaction date and the subsequent trading day. Bootstrapped t-statistics are calculated based on 3000 resamplings. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively.

Purchases			(n=663)	**Sales**			(n=739)
Panel A: Abnormal returns							
Event window	Mean %	t-statistic	bootstrapped t significance	Event window	Mean %	t-statistic	bootstrapped t significance
0	0.19	1.04		0	0.55	3.04***	
1	0.40	2.92***		1	0.21	1.86*	
2	0.41	3.43***		2	-0.09	-0.91	
3	-0.04	-0.12		3	0.01	0.12	
4	-0.08	-0.62		4	0.12	1.15	
5	0.07	0.60		5	0.10	1.10	
6	0.19	1.47		6	-0.12	-1.12	
7	-0.09	-0.15		7	-0.08	-0.76	
8	-0.15	-1.29		8	0.11	1.06	
9	0.14	1.19		9	-0.15	-1.66*	
10	-0.01	-0.08		10	-0.10	-1.33	
Panel B: Cumulative Average Abnormal Returns							
[-40, -1]	-4.55	-5.33***	***	[-40, -1]	5.53	7.08***	***
[0,1]	0.52	2.59***	***	[0,1]	0.66	2.74***	***
[0,5]	0.87	3.05***	***	[0,5]	0.81	2.82***	***
[0,40]	3.46	5.47***	***	[0,40]	-0.44	-0.63	
[5,8]	0.16	0.72		[5,8]	0.02	0.13	
[5,40]	2.67	4.48***	***	[5,40]	-1.14	-1.84*	**

Table 5: Cumulative abnormal returns around insider transactions partitioned by anti-shareholder mechanisms in place

This table reports cumulative average abnormal returns around insider transactions partitioned according to anti-shareholder mechanisms in place at the firm. Panel A shows results for share purchases, panel B for share sales and panel C for option exercises. Abnormal returns are estimated with the CAPM, using the Amsterdam Exchanges All-Share Index as market index. Firms may not employ preference shares, priority shares and depositary receipts at the same time, a maximum two of the three are allowed. Day 5 is assumed to be the announcement date. Bootstrapped t-statistics are calculated based on 3000 resamplings. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

Panel A: Share purchases

Event window	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic	t-statistic difference	bootstrapped t-statistic difference	Wilcoxon Z-statistic difference
	Preference shares (n=410)			*No preference shares (n=253)*				*Difference*	
[0,1]	0.68	2.63***	***	1.43	2.78***	***	1.30	*	-0.30
[0,5]	1.17	3.03***	***	1.52	2.71***	***	0.51	.	0.07
[0,40]	4.93	5.40***	***	2.67	2.44**	***	-1.59	*	-1.53
[5,8]	0.37	1.17	.	-0.33	-0.79	.	-1.34	*	-0.61
[5,40]	3.95	4.54***	***	1.02	1.09	.	-2.28**	**	-1.69*
	Priority shares (n=194)			*No priority shares (n=469)*				*Difference*	
[0,1]	1.31	3.58***	***	0.69	2.31**	**	-1.31	*	-2.03**
[0,5]	1.41	2.56**	***	1.20	3.06***	***	-0.31	.	0.10
[0,40]	2.75	2.60**	***	5.04	5.32***	***	1.61	*	1.12
[5,8]	-0.16	-0.39	.	0.34	1.05	.	0.95	.	1.36
[5,40]	1.22	1.16	.	4.04	4.64***	***	2.05**	**	2.08**
	Structured regime (n=396)			*No structured regime (n=267)*				*Difference*	
[0,1]	0.76	3.28***	***	1.12	2.15**	**	0.64	.	-0.50
[0,5]	1.04	3.10***	***	1.71	2.52**	***	0.89	.	0.61
[0,40]	2.77	3.70***	***	7.28	4.69***	***	2.61***	***	2.03**
[5,8]	0.16	0.56	.	0.23	0.44	.	0.12	.	-0.17
[5,40]	2.03	2.78***	***	5.31	3.74***	***	2.06**	**	1.50
	Depositary receipts (n=105)			*No depositary receipts (n=558)*				*Difference*	
[0,1]	-0.54	-0.93	.	0.67	3.07***	***	2.01**	**	1.00
[0,5]	0.43	0.61	.	0.93	3.02***	***	0.47	.	0.20
[0,40]	2.48	1.68	*	3.59	5.20***	***	0.63	.	-0.20
[5,8]	1.40	2.91***	***	-0.01	-0.03	.	-2.60***	***	-2.77
[5,40]	2.99	1.93*	*	2.63	4.08***	***	-0.21	.	-1.04
	Three anti-shareholder mechanisms (n=157)			*No anti-shareholder mechanisms (n=95)*				*Difference*	
[0,1]	1.05	2.69***	***	0.27	0.58	.	-1.28	.	-3.69***
[0,5]	1.31	2.21**	**	0.35	0.57	.	-1.11	.	-2.05**
[0,40]	3.19	2.76***	***	1.47	1.27	*	-1.05	.	-1.27
[5,8]	-0.18	-0.49	.	-0.03	-0.09	.	0.27	.	0.01
[5,40]	2.09	1.76*	**	1.07	1.02	.	-0.64	.	0.10

Table 5 - continued

Panel B: Share sales									
Event window	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic	t-statistic difference	bootstrapped t-statistic difference	Wilcoxon Z-statistic difference
	Preference shares (n=519)			*No preference shares (n=220)*				*Difference*	
[0,1]	0.45	2.60***	***	0.43	0.82	.	-0.04	.	-0.59
[0,5]	0.87	3.56***	***	-0.10	-0.14	.	-1.34	***	-2.73***
[0,40]	1.12	1.47	*	-4.43	-2.31**	**	-2.69***	***	-5.97***
[5,8]	0.06	0.28	.	0.40	0.87	.	0.66	.	-1.20
[5,40]	0.36	0.52	.	-4.06	-2.30**	**	-2.33**	***	-5.29***
	Priority shares (n=194)			*No priority shares (n=545)*				*Difference*	
[0,1]	0.38	1.83*	**	0.47	1.91*	*	0.28	.	-0.02
[0,5]	1.30	4.33***	***	0.34	1.04	.	-2.13**	**	-2.41**
[0,40]	1.92	2.35**	**	-1.19	-1.18	.	-2.40**	**	-2.43**
[5,8]	0.52	1.94*	*	-0.01	-0.03	.	-1.38	*	-1.94*
[5,40]	0.85	1.07		-1.41	-1.53	*	-1.86*	**	-2.05**
	Structured regime (n=399)			*No structured regime (n=340)*				*Difference*	
[0,1]	0.38	1.75*	**	0.54	1.68*	**	0.40	.	-0.64
[0,5]	0.91	3.16***	***	0.22	0.50	.	-1.30	**	-2.31**
[0,40]	0.57	0.76		-1.45	-0.99	.	-1.22	***	-2.69***
[5,8]	0.70	3.15***	***	-0.64	-1.65*	**	-3.00***	***	-3.33***
[5,40]	-0.11	-0.15		-1.63	-1.25	.	-1.02	**	-2.21**
	Depositary receipts (n=142)			*No depositary receipts (n=597)*				*Difference*	
[0,1]	0.76	3.18***	***	0.63	2.15**	***	-0.64	.	-1.54
[0,5]	1.89	4.83***	***	0.56	1.66*	**	-2.71***	***	-3.51***
[0,40]	3.97	4.30***	***	-0.14	-1.71*	**	-4.43***	***	-5.33***
[5,8]	0.73	2.62***	***	-0.13	-0.56	.	-2.30**	**	-2.55**
[5,40]	2.16	2.44**	***	-0.19	-2.55**	***	-3.50***	***	-4.04***
	Three anti-shareholder mechanisms (n=157)			*No anti-shareholder mechanisms (n=95)*				*Difference*	
[0,1]	0.70	3.35***	***	1.86	2.01**	**	1.22		-0.16
[0,5]	1.87	6.21***	***	1.51	1.48		-0.34		-2.85***
[0,40]	3.97	4.76***	***	-0.30	-0.15		-1.94*	*	-5.40***
[5,8]	1.05	4.60***	***	-0.28	-0.69		-2.85***	***	-4.15***
[5,40]	2.33	3.01***	***	-1.87	-1.18		-2.38**	**	-4.95***

Table 6: Cross-sectional determinants of abnormal return patterns following insider purchases

Anti-shareholder index is a count of the number of anti-shareholder mechanisms employed at the firm. *Ex-ante switcher* is a binary variable equal to 1 if the firm was likely to change the number of anti-shareholder mechanisms in response to the 2004 regulations. *After 2004* is a binary variable equal to 1 for trades placed after 2004. *Insider dummies* are binary variables that equal 1 if the insider placing the trade performs a function of the corresponding type at the time of the transaction. CEOs are excluded from the category Executive Board. The base category is other insiders, which includes large shareholders, the management board and supervisory board of companies in which the company has an interest of at least 10%, partners and first degree relatives of CEOs, executive board members and supervisory board members that live in the same household, first-degree relatives of CEOs, executive board members and supervisory board members that do not live in the same household, but have an equity stake of at least 5% in the company and members of the workers' council. *ROE* and *leverage* are the return on equity and debt-to-equity ratio at the end of the year, respectively. *Largest blockholder dummies* (directors, financial institutions, families or individuals, industrial or commercial companies and government) are set to one if shareholders belonging to the corresponding category have the largest stake as compared to the other categories. The base case is no blockholder of 5% or more. *Economic trend* dummies: the base category is the period from March 12 2003 until the end of the sample period in 2007. T-statistics are calculated based on Huber-White standard errors, and are clustered at the firm level in columns (1) and (3), and at the firm and the year level in columns (2) and (4). ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: CAR[0,40]							
	OLS with firm FE		OLS		OLS with firm FE		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	7.14***	4.30	-6.50	-0.38	3.23	0.16	-9.26	-0.61
Anti-shareholder index	-2.21**	-2.22	-2.39**	-2.20	-3.55***	-2.85		
Ex-ante switcher							-4.07**	-2.42
After 2004							-5.36***	-2.65
After 2004 × ex-ante switcher							5.29**	2.33
Insider: CEO			1.39	0.55	4.22	1.39	0.93	0.33
Insider: executive board member			-0.57	-0.19	1.78	0.62	-0.62	-0.19
Insider: supervisory board member			-2.85	-1.31	2.62	0.96	-1.83	-0.60
Largest: directors			-2.98	-1.37	-23.6***	-4.39	-1.72	-0.65
Largest: financial institutions			3.28	1.60	-6.51***	-4.09	3.59	1.17
Largest: families or individuals			-0.68	-0.22	-6.76**	-2.03	1.38	0.50
Largest: ind./com. companies			16.08**	2.15	-6.53**	-2.21	16.30**	2.21
Largest: government			13.91**	2.20			13.00**	2.58
Firm size (ln market cap)			0.49	0.67	0.43	0.44	0.60	0.87
ROE			-0.06**	-2.17	-0.08**	-2.14	-0.07**	-2.19
Leverage			1.55	0.40	7.93	1.45	0.91	0.22
Firm age (in 1999)			0.01	0.73			0.01	0.41
Economic growth 1-4-99 to 4-9-00			1.24	0.56	4.94	1.65		
Economic decline 5-9-00 to 12-03-03			1.32	0.53	3.45	1.07		
Number of observations	663		663		663		663	
Adjusted R^2	30.36%		11.02%		33.80%		11.30%	

Table 7: Cross-sectional determinants of abnormal return patterns following insider sales

Anti-shareholder index is a count of the number of anti-shareholder mechanisms employed at the firm. *Ex-ante switcher* is a binary variable equal to 1 if the firm was likely to change the number of anti-shareholder mechanisms in response to the 2004 regulations. *After 2004* is a binary variable equal to 1 for trades placed after 2004. *Insider dummies* are binary variables that equal 1 if the insider placing the trade performs a function of the corresponding type at the time of the transaction. CEOs are excluded from the category Executive Board. The base category is other insiders, which includes large shareholders, the management board and supervisory board of companies in which the company has an interest of at least 10%, partners and first degree relatives of CEOs, executive board members and supervisory board members that live in the same household, first-degree relatives of CEOs, executive board members and supervisory board members that do not live in the same household, but have an equity stake of at least 5% in the company and members of the workers' council. *ROE* and *leverage* are the return on equity and debt-to-equity ratio at the end of the year, respectively. *Largest blockholder dummies* (directors, financial institutions, families or individuals, industrial or commercial companies and government) are set to one if shareholders belonging to the corresponding category have the largest stake as compared to the other categories. The base case is no blockholder of 5% or more. *Economic trend* dummies: the base category is the period from March 12 2003 until the end of the sample period in 2007. T-statistics are calculated based on Huber-White standard errors, and are clustered at the firm level in columns (1) and (3), and at the firm and the year level in columns (2) and (4). ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: CAR[0,40]							
	OLS with firm FE		OLS		OLS with firm FE		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-5.22***	-3.22	-19.28*	-1.87	-74.16	-1.35	-21..07**	-2.07
Anti-shareholder index	2.81***	2.95	1.82	1.43	5.86***	3.27		
Ex-ante switcher							5.13**	2.24
After 2004							0.77	0.27
After 2004 × ex-ante switcher							-3.78*	-1.81
Insider: CEO			-8.12**	-2.03	-1.25	-0.20	-7.60**	-2.43
Insider: executive board member			-0.47	-0.13	-1.46	-0.37	-1.07	-0.29
Insider: supervisory board member			-2.59	-0.95	-1.47	-0.30	-3.34	-1.32
Largest: directors			-4.01	-0.89	-38.16*	-1.95	-3.60	-1.01
Largest: financial institutions			0.42	0.11	-24.00***	-4.66	0.91	0.86
Largest: families or individuals			1.75	0.27			3.22	0.34
Largest: ind./com. companies			1.22	0.25	-15.17	-0.73	2.25	0.48
Largest: government			-9.61	-1.08	-23.94***	-5.43	-11.24	-1.26
Firm size (ln market cap)			0.92**	2.06	4.48	1.63	1.01*	1.92
ROE			-0.004	-0.34	0.05	1.57	-0.001	-0.05
Leverage			2.48	1.63	8.36**	2.63	2.46*	1.68
Firm age (in 1999)			-0.005	-0.29			0.000	0.05
Economic growth 1-4-99 to 4-9-00			0.84	0.23	-3.88	-0.82		
Economic decline 5-9-00 to 12-03-03			-2.47	-1.30	-4.74	-1.50		
Number of observations	739		739		739		739	
Adjusted R^2	16.80%		5.80%		19.20%		5.90%	