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Insider Trading, Option Exercises and Private Benefits of Control

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MŰHELYTANULMÁNYOK **DISCUSSION PAPERS**

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Insider Trading, Option Exercises and Private Benefits of Control

PETER CZIRAKI - PETER DE GOEIJ -

LUC RENNEBOOG

INSTITUTE OF ECONOMICS, HUNGARIAN ACADEMY OF SCIENCES
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Insider Trading, Option Exercises and Private Benefits of Control

Authors:

Peter Cziraki
PhD candidate
Department of Finance
Tilburg University
E-mail: p.cziraki@uvt.nl

Prof. Dr. Luc Renneboog
Department of Finance
Tilburg University,
Tilburg Law and Economics Center
and European Corporate Governance Institute
E-mail: luc.renneboog@uvt.nl

Peter de Goeij
Adjunct Associate Professor
Department of Finance
Tilburg University and Tilburg Law and Economics Center
E-mail: p.c.degoeij@uvt.nl

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Insider Trading, Option Exercises and Private Benefits of Control

Peter Cziraki - Peter de Goeij - Luc Renneboog

Abstract

We investigate patterns of abnormal stock performance around insider trades and option exercises on the Dutch market. Listed firms in the Netherlands have a long tradition of employing many anti-shareholder mechanisms limiting shareholders rights. Our results imply that insider transactions are more profitable at firms where shareholder rights are not restricted by antishareholder mechanisms. This finding goes against the monitoring hypothesis which states that more shareholder orientation and stronger blockholders would reduce the gains from insider trading. We show robust support for the substitution hypothesis as insiders of firms which effectively curtail shareholder rights enjoy valuable private benefits of control in lieu of engaging in insider trading to exploit their position.

Keywords: insider trading, management stock options, timing by insiders, corporate governance, antishareholder mechanisms, anti-takeover mechanisms

JEL: G14, G34, M52

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Bennfentes kereskedés, opciólehívások és a vállalat irányítóinak személyes haszna

Cziráki Péter - Peter de Goeij - Luc Renneboog

Összefoglaló

E tanulmányban a holland részvénypiacon bejelentett legális bennfentes részvénytranzakciókat és opciólehívásokat kísérő abnormális hozamokat vizsgáljuk. Hollandiában a tőzsdén jegyzett vállalatok hosszú ideje alkalmaznak olyan eszközöket, amelyek a részvényesek jogait csorbítják. Vizsgálatunk eredményei szerint a bennfentes kereskedésen elérhető hozam jóval magasabb azon vállalatoknál, amelyek nem alkalmazzák a részvényesek jogait korlátozó szabályokat. Ez cáfolni látszik az ellenőrzési hipotézist, amely szerint a szélesebb részvényesi jogkör, és a nagy részvénytulajdonosok jelenléte mérsékli a bennfentes tranzakciókon kereshető profitot. Robusztus eredményeink ugyanakkor igazolják a helyettesítési hipotézist, amely azt állítja, hogy a részvényeseket háttérbe szorító vállalatok bennfentesei a pozíciójukat kihasználva olyan előnyöket csikarnak ki, amelyek értékesebbek a bennfentes tranzakciókon nyerhető profitnál.

Tárgyszavak: bennfentes kereskedés, vezetői opciócsomagok, piaci tranzackiók időzítése, vállalatkormányzás, részvényesi jogok, felvásárlás ellen védő mechanizmusok

JEL: G14, G34, M52

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)). Analyses of insider option exercises have yielded similar results (Huddart and Lang (2003), Bartov and Mohanram (2004)). To the extent that profitable trading is conducted at the expense of outside shareholders, insider trading and option exercises based on private information constitute one way for managers to abuse their position at the firm. The recent option backdating scandal[1] highlights yet another example of insiders' ill-gotten gains; moreover, besides being arguably unethical, option backdating is also against the law (Narayanan, Schipani and Seyhun (2007)). Analyzing insider transactions is important because they have been documented to have a signaling value to investors, in the short term. Given the private information content of insider trading and option exercising, the magnitude of profits accruing to insiders is an indication of the degree of agency problems at the firm (Bebchuk and Fried (2003)).

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 if they fail to cooperate. The market for corporate control can sanction inefficiencies if the new controlling shareholders impose rigor upon, or simply replace managers who exploit the firm. However, what happens if legally imposed restrictions on shareholder rights disable effective corporate governance? How can shareholders prevent managers from setting their own pay, using company assets for private purposes, or engaging in insider trading if they do not have the right to replace the board, or, even worse, their voting rights are completely stripped? How credible is a takeover threat in a market where two-thirds of the firms have a poison pill?

In this paper we investigate insider trading, option exercises 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 extant 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

[1] Two late examples include the president and chief operating officer of Monster found guilty of options backdating (Bray (2009) and Take Two Interactive Software who agreed to pay $3 million to settle a lawsuit in which they were charged with options backdating (Bloomberg News (2009)).

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 unique dataset contains information on blockholder ownership, as well as anti-shareholder devices employed by firms. Among these anti-shareholder mechanisms, the structured regime is a two-tier board system complemented by the reallocation of decision rights within the company at the expense of shareholders, to the supervisory board. Priority shares are special voting stock whose holder gains the right to decide on influential issues, usually on executive board and supervisory board nominations. Preference shares are tantamount to poison pills and essentially block takeover threats. Depositary receipts are non-voting certificates with full cash-flow rights issued by a trust, in exchange for deposited shares.

First, we delineate and theoretically 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 (and option exercising), insider transactions will be a *substitute mechanism* that insiders resort to if they are barred from exploiting other private benefits. Second, we explicitly analyze how the profits earned on option exercises by insiders are related to the quality of corporate governance, which, to the best of our knowledge is a question that has not been pursued previously in the literature. Third, we provide strong empirical support for the substitution hypothesis. This result is valid for insider purchases, sales and option exercises, 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. Fourth, 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 about 3.5% over the 40-day window following their purchases. However, this is not because they purchase in response to strong stock price performance. On average, purchases, sales and option exercises are preceded by a 40-day cumulative abnormal return of -4.55%, 5.53% and 8.34%, respectively, with abnormal return trends generally reversing over the same horizon following the transaction. We also document that abnormal profits after CEO purchases amount to almost 5%, but when CEOs sell, the average abnormal loss is in excess of -10%. Abnormal stock price movements are less sharp following transactions of executive board members other than the CEO, supervisory board members and other insiders, consistent with an information hierarchy among insiders.

Our findings on the relationship between corporate governance 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 conservatively estimate the lower bound of entrenchment benefits provided by one anti-shareholder mechanism at approximately €13,400 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 about €300,000.

The remainder of the paper is structured as follows. In Section II we offer a synthesis of prior literature on insider trading and insider option exercises, based on which we then develop our research hypotheses. Section III describes the measures used to suppress shareholder rights in the Netherlands. Section IV presents the data and methodology and in Section V we detail our findings on insider trading and option exercises and assess the robustness of our results. In Section VI we estimate the value of private benefits in monetary terms. Section VII summarizes and concludes the paper.

II. Literature review and hypothesis development

II.1. Insider trading, option exercises and cross-sectional determinants of insiders' profits

Insider purchases and sales

By buying (selling) shares of their own firm, insiders increase (decrease) their exposure to the firm's share price. Exercising options and retaining the resulting share stake similarly increases an insider's wealth at risk. In addition, early exercising prior to maturity can also reveal to the market the insider's information about the firm's prospects. The efficient market paradigm holds that the market is strong-form efficient if no investors possess private information that is not reflected in stock prices. Market efficiency is of the semi-strong form if prices adjust to publicly available information other than historical share prices (Fama (1991)).

Initially, returns to insider trading were examined to investigate if insiders were able to exploit private information to earn profits. Jaffe (1974) showed that insiders earn abnormal

returns as they purchase (sell) shares prior to abnormal share price appreciation (depreciation).[2] The main results of Seyhun (1986, 1998) show that abnormal returns peak around insider sales and depict a valley pattern around purchases. His findings are in line with the theory that insiders trade on private information. 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 ample 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.[3] Furthermore, 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 (2009).

In line with prior literature, we hypothesize that insiders will trade profitably by exploiting private information. We thus expect *cumulative abnormal returns (CARs) to be negative (positive) in periods before an insider purchase (sale), but also that they 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 et al. (2002) and Fidrmuc et al. (2006) for UK firms.

Insiders' option exercises

We also assess the abnormal stock return patterns around option exercises. The study of Huddart and Lang (1996) indicates that exercise behavior is related to prior returns but not to

[2] A further question was if outside investors could earn profits using announcements on insider trades. Lorie and Niederhoffer (1968), Jaffe (1974) and Chang and Suk (1998) find that the secondary dissemination of information still allows for such trading gains. Bettis, Vickrey and Vickrey (1997) show that mimickers of insider trades can earn substantial returns, even after subtracting transaction costs. However, the results of Seyhun (1986), Rozeff and Zaman (1988) and Friederich, Gregory, Matatko and Tonks (2002) reach opposite conclusions.

[3] 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 (2009) 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.

subsequent returns. Carpenter and Remmers (2001) find significant positive stock performance in the days (months) before insiders exercise their stock options. However, they only document negative abnormal returns after exercises by top managers at small firms. Although these two studies provide little evidence that insider option exercises are based on private information, the findings of Huddart and Lang (2003) and Bartov and Mohanram (2004) suggest otherwise. Huddart and Lang (2003) unveil that option exercises are significantly more frequent in advance of stock price downturns and conversely, fewer options are exercised prior to periods of stock price appreciation. The conclusion of Bartov and Mohanram (2004) is also that option exercises are motivated by private information. In particular, they claim that insiders know whenever observed good performance is a result of earnings management, and will therefore not persist. They further advocate examining large option exercises rather than all transactions, similarly to Eckbo and Smith (1998) who give sizeable transactions more weight, in contrast with the stealth trading hypothesis of Barclay and Warner (1993).[4] Bartov and Mohanram (2004) argue that this difference in methodology is the reason that their findings are at odds with those of previous papers. Despite conflicting results of prior studies, we conjecture that *insider option exercises are based on private information and are therefore preceded by positive abnormal returns and followed by negative abnormal performance*.

Option packages customarily have a vesting period of a few years, during which they cannot be exercised. From the vesting date the options can be exercised until they expire. Huddart and Lang (1996) document that most employees do not wait until expiration to exercise their option packages. Brooks, Chance and Cline (2007) reach a similar conclusion as they find that 92.34% of the options are exercised before the expiration date. The results of Bettis, Bizjak and Lemmon (2005) also evidence that early exercise is widespread, with exercise occurring a little over two years subsequent to vesting and more than four years prior to expiration on average. Options exercised at vesting are more likely converted into shares for liquidity reasons. Insiders who hold options that are just about to expire will always exercise them rather than let the option grant lapse. Thus, we expect that *the absolute magnitude of abnormal returns to be the largest around option exercises subsequent to the vesting date but prior to the expiration date*.

It should also not be overlooked that, in addition to timing option exercises, managers also pursue other ways of securing additional gains on their option packages.[5] Further phenomena documented in the literature include favorable timing of option grants (Yermack (1997), Aboody and Kasznik (2000)), repricing option packages that are out of the money (Brenner, Sundaram

[4] Eckbo and Smith (1998) study insider trades, rather than option exercises.

[5] Managers are known to alter features of option packages to their own advantage (Bebchuk and Fried (2003)). More generally some executives are able to influence their own pay (Bertrand and Mullainathan (2001). Sometimes this appears in a blatant manner, when executives sit on their own compensation committee, but there are several other, indirect ways they can control their compensation package.

and Yermack (2000)) and backdating (Lie (2005), Heron and Lie (2007), Narayanan et al. (2007)). Yermack (1997) and Aboody and Kasznik (2000) provide strong evidence that CEOs are able to influence the timing of their options awards. If executive stock options are to properly motivate management, then the terms of the options should not be altered, most importantly when the option becomes worthless due to the actual share price declining below the strike. However, Brenner et al. (2000) show that the options of 1.3% of the executives in their sample were repriced with an average price reduction of 40%. Furthermore, smaller firms alter the terms of management options more often; possibly they can do so because they receive less public attention. Moreover, recent studies report that some companies have even engaged in the abusive and, more importantly, potentially illegal practice of options backdating.[6] Narayanan et al. (2007) point out that backdating not only channeled funds from shareholders to managers, but also imposed substantial deadweight losses on the firms involved.

Provided that there are patterns of abnormal returns around insider transactions, several factors may drive the magnitude of these returns. Insiders in small firms have a stronger informational advantage since these firms receive less attention from analysts. This would imply a negative correlation between the information content of directors' dealings and firm size. Seyhun (1986) provides empirical evidence that insider trading is more profitable in small companies.[7] This relation holds also for option exercises: Carpenter and Remmers (2001) report short-term abnormal performance only after exercises by CEOs of small firms. Thus, we expect *the absolute value abnormal returns around insider purchases, sales and option exercises to be inversely related to firm size*.

As our initial position is that insiders can earn abnormal returns using private information, we also aim at investigating whether the value of this information differs by insider type. The information hierarchy hypothesis asserts that insiders who possess more information on the operations of the company, i.e. chairmen, chief executives and other officer-directors, are able to realize larger profits on their transactions. On one hand, Sheyhun (1986, 1998) and Lin and Howe (1990) have found empirical support for this hypothesis. On the other hand, Jeng et al. (2003), Fidrmuc et al. (2006) and Betzer and Theissen (2009) discern no such effect for insider trades and Huddart and Lang (2003) report that the option exercises by junior employees are just as informative of the future stock price as exercises by top management. In spite of the latter results, we conjecture that *share purchases, share sales and option exercises by the chief executive director and other executives are timed more accurately than transactions of other insiders*.

[6] Backdating of option packages is not illegal in itself. However, if firms do not disclose it, they break accounting rules; as such grants are to be recorded as a noncash expense. The SEC has imposed stricter rules in 2006, following the backdating scandals (Scannell and Lublin (2006))

[7] Jeng et al. (2003), however, find no relation between the profitability of insider trading and the size of the firm.

II. 2. The effect of corporate governance on insider trading profits

An ample body of literature shows that firms benefit from good corporate governance. Strong corporate governance has been documented to positively impact share prices in the long run (Gompers, Ishii and Metrick (2003), Cremers and Nair (2005)), to decrease agency costs (Shleifer and Vishny (1997)) and, recently, to curtail (opportunistic) insider trading (Fidrmuc et al. (2006), Rozanov (2008), Ravina and Sapienza (2009)). 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)). The empirical results of Franks, Mayer and Renneboog (2001), indicate that large industrial shareholders (and to a lesser extent of family shareholdings) have a positive effect on the intensity of monitoring within a company, whereas institutional investors (e.g. banks, insurance companies, investment and pension funds) usually take a more passive stance.

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 for well-monitored firms. 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 instead. In contrast, Rozanov (2008) argues that while transient institutional investors in the US do not monitor insiders, dedicated institutions actually curb profitable insider trading. 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 (Fidrmuc et al. (2006)). 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 (2009) 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, Ishii and Metrick

(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. To the best of our knowledge, our paper is the first to investigate the impact of corporate governance on insiders' option exercises. The two hypotheses underlying our analysis are what we shall 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), Rozanov (2008) and Betzer and Theissen (2009). While good corporate governance has been shown, e.g. 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 benefits can outweigh potential gains from insider trading and insiders will therefore seek private benefits at firms with weak corporate governance.

The reader might argue that insiders could choose to exploit *both* private benefits of control *and* still engage in profitable insider trading. A possible explanation of why insiders at firms with weak governance choose only to reap private benefits of control, but not to earn high profits on their trades is based on loss of reputation. The Netherlands Authority for the Financial Markets (AFM) may investigate the trade (after, and even though, the insider has duly reported it)

to discern whether the insider has traded on private information.[8] When the AFM starts an investigation and especially when public prosecution then indicts the insider (even if she is later acquitted – as trading on information is hard to prove), suspicions arise in the market about her integrity and ability to serve the interest of shareholders. Hence, she faces a loss of reputation that may result in the termination of her contract, or not being re-elected. The consequences of a tarnished reputation are more severe for insiders of firms with low shareholder rights because, given the high level of private benefits that they can enjoy (for several years), they have more to lose. Hence they are more averse to a potential loss of reputation and will not time their trades to perfection in order not to attract the suspicion of the AFM.

Also, insiders may refrain from trading on private information if they are able to reap private benefits of control, because of risk aversion. 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.

A third idea that can explain why insiders enjoying substantial private benefits would not trade on private information is one similar to that of Loughran and Ritter (2002). They show that manager-owners act irrationally as they do not mind leaving a considerable amount of money on the table in IPOs. Their explanation is that because of the surge in the share price on the day following a deeply underpriced IPO, managers' portfolio wealth soars. As a consequence, managers are not upset about the wealth transfer to new investors and the additional dilution, which they could have avoided, had they set a higher price. Although managers could have increased their own wealth further through a higher price, forgone profits appear less important when considered alongside the gains they enjoy because of the stock price jump. The notion that insiders do not necessarily maximize their own wealth through multiple activities, when their gains from one source are large enough, is what we argue as well. Since insiders reap a major windfall in the form of private benefits, they may be less interested in further increasing their wealth by timing their trades accurately.

Empirically, the monitoring and substitution hypotheses may not be mutually exclusive. This means that in companies with poor corporate governance, insiders can extract private benefits of control and perform insider trading. For the substitution hypothesis to hold, the degree of insider trading in firms where insiders are entrenched should be lower than that in well monitored companies.

[8] The next section, III. 1. describes the Dutch legislation on insider trading and how it is enforced.

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

III. 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.[9] 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) who subsequently publishes this information on its website and in the financial daily *Financieel Dagblad*.

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 has not reached 5000 EUR. In these cases, the insider can defer disclosure until the cumulative transaction value surpasses the 5000 EUR threshold.[10] 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*. We therefore use day 5 as the reporting day in the empirical analysis of the paper. Degryse, De Jong and Lefebvre (2009) analyze the information content of insider trades in the different reporting regimes.

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 inspection. If there is sufficient evidence to corroborate the initial suspicion, the

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

[10] 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.

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.[11] This means that neither the unconditional probability of an inspection taking place, nor the probability of an indictment conditional on being inspected is negligible. Therefore, loss of reputation can indeed play a role in insiders' trading decisions, as suggested in the previous section.

III. 2. Corporate governance regulation and anti-shareholder mechanisms in the Netherlands

Relating the informativeness of insider trades, block trades and insiders' option exercises 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)).

In the Netherlands, six protective measures are widely used: protective preference shares, priority shares, certificates, structured regime[12], binding appointments, and voting caps. It is common for Dutch firms to instate defense mechanisms (anti-shareholder devices) in the form of special securities, thereby explicitly violating the one-share-one-vote principle. The following three types of securities are commonly used to curtail the power of ordinary shareholders:

- **Protective preference shares** – tantamount 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

[11] We obtain these figures from the annual reports of the AFM. Both the number of inspections and the number of indictments depict a "U" sharpe during our sample period. Both figures peaked in 1999 (72 inspections and 13 indictments). Inspections 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 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.

[12] 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.

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 depository 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 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.

An important feature of the Dutch governance regime is that further institutionalized restrictions may be imposed on shareholder control by law. In addition to the anti-shareholder devices mentioned so far, numerous Dutch firms have what is 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.

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. Although shareholders retain the right to vote on payout policy and takeovers, they are practically left with a marginal role in holding management accountable. Accordingly, Cuijpers, Moers and Peek (2005) find that companies that have a structured regime in place smooth earnings more actively, report more conservatively and are less likely to meet or beat analyst forecasts.

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. This **mitigated structured regime** enables shareholders to vote on the annual accounts and the

appointment of management, but preserves the appointment of supervisory board members by co-optation. Firms are fully exempted if more than 50% of their employees work abroad or if their majority owner is a Dutch multinational that has adopted the structured regime. Nonetheless, 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, DeJong, Mertens, and Wasley (2005)).

Binding appointments mean that a specific party, other than shareholders, is granted the right to appoint board members. Bearers of priority shares commonly receive binding appointment rights; therefore we do not pursue this measure further. **Voting caps,** although still legal in the Netherlands, have been phased out by listed firms (OECD (2004, 2007)), thus are of no interest to our investigation.

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) point out that firms that operate under any form of the structured regime are more likely to install and also to combine preference shares, priority shares and certificates.

De Jong et al. (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 anti-shareholder devices. Accordingly, the turnout at annual general meetings is quite low and those participating put forward few proposals or none at all. In turn, management-sponsored proposals are hardly ever opposed. The findings of De Jong, Mertens and Roosenboom (2006) are illustrative of the peculiar features of Dutch companies' annual meetings. For the period of 1998-2002 they examine 245 annual meetings and find that on average a mere 30% of shareholders were present, only to sponsor no proposals at all. Management, on the other hand, put forward 1583 proposals of which only 9 were rejected or withdrawn (Cziraki, Renneboog and Szilagyi (2009)).

Clearly, management may use their voting power at annual meetings to pass recommendations on payout policy. 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. This also holds for Dutch multinationals that retain the structured regime in spite of being exempted. Furthermore, preference shares have the same effect on dividend policy, even after controlling for the correlation (mentioned earlier) between the adoption of a structured regime and the use of special securities.

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.*

III. 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.[13] The Code basically 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 works 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 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

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

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.[14]

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 see the correlation between the two phenomena decline after 2004. We therefore hypothesize *that profits to insider trading are negatively related to the number of anti-shareholder mechanisms employed by the firm until 2004, but not afterwards.*

IV. Data sources, descriptive statistics and methodology

IV. 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 III 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 transactions performed by insiders of companies not quoted on the Dutch stock market are erased from the sample, as are trades in convertible securities, restricted share awards, stock appreciation right awards and warrant-related transactions. We aggregate multiple insider purchases and sales of one insider, taking place on the same day into a single transaction and, in a similar fashion, aggregate option exercises by the same person on the same day into one observation. If the AFM database indicates that transactions occurred in the weekend (Saturday or Sunday), these transactions are dealt with as if they had occurred on the closest neighboring

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

trading day that corresponds with the price paid by the insider. 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 can then not 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.[15]

The market returns are based on the Amsterdam Exchanges All-Share Index as market index. Since the exercises in the sample not only refer to companies listed at the AEX, but also to midcap and small cap companies, we consider this index as 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.

IV. 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.

– Insert Table 1 here –

Panel A shows statistics on the full sample, whereas Panel B partitions transactions by years 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%). The mean (median) value of insider purchases peaked in 2004 (1999), while the largest mean

[15] 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).

(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 and describes the correlation patterns between these provisions.

– Insert Table 2 here –

IV. 2. Methodology

We use event study methodology to identify to the gains on insider purchases, sales and option exercises. To understand whether the gains are due to timing, we also check the pre-transaction abnormal returns for all categories. To define expected returns, we use the CAPM as a benchmark: $E(R_{i,t}) = R_{f,t} - \beta_i (R_{m,t} - R_{f,t})$ where β_i is the covariance of the stock's return with the market divided by the variance of the market return, $R_{f,t}$ is the risk-free rate, and $(R_{m,t} - R_{f,t})$ is the market risk premium. The abnormal return is then: $AR_{i,t} = R_{i,t} - NR_{i,t}$

The average abnormal return for a given day is: $AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t}$, where N is the number of insider option exercises in our sample. We calculate the cumulative abnormal returns by summing the abnormal returns over time: $CAR_i(c,d) = \sum_{t=c}^{d} AR_{i,t}$, where c and d are the first and the last days of the period. Finally, we compute the cross-sectional average of the cumulative abnormal returns, to eliminate the idiosyncratic effects that might arise for different companies. The cumulative average abnormal return for a given period is: $CAAR(c,d) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(c,d)$

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 (1999) and run the bootstrap simulations with 3000 repetitions.

To provide further evidence that the substitution hypothesis explains the negative correlation 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 III. 3., Dutch legislators and the Committee on Corporate Governance pushed to mitigate the impact of anti-shareholder devices. This has two implications for our sample firms. First, there were companies that cancelled some of their anti-shareholder devices (mostly depositary receipts). Second, even if a firm did not phase out any anti-shareholder mechanisms, according to the new regulations, some of the mechanisms became less effective in curbing shareholder rights. Both of these effects lead 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.

The substitution hypothesis maintains that insiders concentrate more on timing their trades in the company's instruments if they cannot enjoy private benefits of control. As our sample became more uniform in terms of the levels of private benefits after the 2004 corporate governance changes, according to the substitution hypothesis, the sample should also become more uniform in terms of the profitability of insider transactions. This means that we would expect to see a strong correlation between the number of anti-shareholder mechanisms and the profitability of insider transaction prior to 2004, but none or a weaker one afterwards.

To investigate this, we adopt a differences-in-differences (DD) strategy. We construct a dummy variable for transactions that took place prior to or in 2004 and include it, as well as its interaction with the anti-shareholder index, in the regressions of Table 8.[16] Although the change in the corporate governance code became effective on January 1, 2004, many companies amended their corporate governance provisions only in or after 2005. Therefore, we repeat this procedure with a dummy variable for transactions before or in 2005.

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

V. Results

We first conduct tests on the full sample of insider purchases, sales and option exercises, to analyze whether and to what extent insiders are able to time the market and gain from their transactions. The results are exhibited in Table 3.

– Insert Table 3 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. When considering this evidence together with the stock price movements preceding these transactions, it is apparent that insiders are able to time their trades. 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.

Next, we consider the CARs around insider purchases, sales and option exercises in sub-samples based on the size of the firm (as measured by the logarithm of market capitalization). Given the distribution of our sample companies we set the cutoff value to 2bn EUR: roughly 25% of transactions are conducted at companies above this value. The results of this size analysis present no significant difference between the abnormal share price movements at small and large companies.[17] In Tables 4 and 5 we assess whether abnormal share price performance around insider transactions differs by the role the insider assumes at the company.

– Insert Tables 4 and 5 here –

Table 4 shows that insiders in all categories earn significantly positive abnormal returns during the 40 trading days following their stock purchases. Whilst we observe a marked negative CAAR of over −10% following CEO sales, CARs for the other categories of insiders lack statistical significance. The CAAR of almost −11% preceding CEO purchases, followed by a CAAR of some +5% suggests that chief executives use their superior information to time

[17] Table available upon request.

transactions in the company's stock. It is particularly striking that the positive and negative CAARs before and after CEO sales are almost identical in their absolute magnitudes.

The comparison tests reported in Table 5 confirm that the share price decline preceding CEOs' purchases is significantly deeper, suggesting superior timing. In contrast, the differences in CARs around purchases of other groups are negligible. CEOs' stock sales are followed by significantly larger abnormal declines in the stock price when compared to other categories of insiders. When comparing the sales of supervisory board members and executive board members we find that that CAARs are significantly lower following sales of the former group.

Customarily, option packages granted to employees have a vesting period of some years, during which the options cannot be exercised. Insiders may regard their option packages as part of their normal compensation package and exercise the options as soon as they vest to satisfy their liquidity needs. In these cases, they are unable to adjust the time of the option exercise to the firm's share price, therefore we expect that positive CARs are smaller in absolute value preceding option exercises at the vesting. Investors who observe that an exercise took place immediately at vesting would not consider this transaction to have been triggered by private information. Thus, we only expect that exercises after the vesting date contain private information and hence are followed by a negative CAR. In our sample, 228 of the option exercises in our sample occur at vesting, whilst the majority, 937 occur after vesting.

We further partition the latter group into exercises that took place at, or closely before the option packages lapse (215 observations), and exercises neither at vesting nor at expiration, but between the two dates (737 observations). As the expiration date approaches, a rational investor would always exercise option packages, because they are worthless after they expire. Given that the expiration date of the option grant is also a fixed date, just as the vesting date, we expect that the CARs following option exercises will not be different from zero. Also, the abnormal share price run-up should be less steep preceding exercises at expiration. Finally, we expect significantly positive (negative) CARs preceding (following) option exercises between vesting and expiration, and the magnitude of CARs in this group to be larger than for option exercises at vesting or at expiration.

– Insert Table 6 here –

Our findings, presented in Table 6 confirm that abnormal returns prior to option exercises are highest for transactions between the vesting and expiration dates. The CAAR of this group equals 9.64%, significantly greater than (approximately twice the magnitude of) the options exercised at expiration. Although the share price run-up of this group is also larger than that of the options exercised at vesting, the difference is statistically insignificant. However, over the

four-day window following the option exercise, we discern a significant negative reaction to exercises taking place between vesting and expiration. This negative CAR is significantly lower than the (positive) CAR calculated for exercises immediately after vesting. Therefore, we find some evidence that option exercises that are the most likely to have been triggered by private information are followed by negative CARs.

Insiders' timing of the transaction, however, may also be driven by whether the shares were sold after an option exercise. Shares are fully sold following the overwhelming majority (1,179 out of 1,392) of option exercises in our sample. Nonetheless, in untabulated results, we verify that pre-exercise positive CARs are significantly higher and the post-transaction CARs are significantly more negative for option exercises after which the obtained shares are sold, as opposed to when they are retained (174 observations).

Lastly, we scrutinize how anti-shareholder mechanisms (described in Section IV) influence the CARs around insider purchases, sales and option exercises. Table 7 presents CARs around 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 depository receipts simultaneously.

– Insert Table 7 here –

Panel A of Table 7 examines the impact of anti-shareholder mechanisms around purchases. We find no disparity between firms with and without preference shares in terms of the share price decline prior to the purchase. 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. CARs before a purchase are indistinguishable from zero at companies with priority shares, whilst the price drops 7.7% over the 40 days before the purchase at firms without this anti-shareholder measure. Moreover, 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 both the pre- and the post-transaction share price movements are more pronounced at firms with no priority shares, the data support the substitution hypothesis. Purchases are timed more accurately 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, the timing of purchases is less accurate 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: both pre- and 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. The insiders of companies without the structured regime on average purchase shares when the abnormal return had declined by 10.4%, which is a much larger decrease than for companies that impose the structured regime (-2.5%). During the 35 days following the announcement date of the purchase (day 5), the abnormal rise in the stock price is in excess of 5% for firms without the structured regime as opposed to 2% at firms that apply this anti-shareholder mechanism. CARs following the event as well as the announcement are comparable in magnitude for the subsamples of firms with and without depository receipts.[18]

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. Abnormal losses in the 40 days leading up to the exercise are much more severe for companies without anti-shareholder mechanisms. In contrast, firms using three or no anti-shareholder mechanisms do not differ significantly in terms of the post-purchase CARs. The results thus far suggest that the absence of anti-shareholder mechanisms magnifies the absolute values of both the CARs preceding and following insider purchases. This pattern of CARs supports our substitution hypothesis, whereas it casts doubt on the validity of the monitoring hypothesis. We now perform identical tests on sales (Table 7, Panel B) and option exercises (Panel C).

The first part of Panel B shows CARs around insider sales at firms with and without preference shares. The share price run-up before the sale is notably sharper in the absence of preference shares (11.75%), as is the subsequent decline, irrespective of whether the CARs are measured from the transaction date [0,40] or the supposed reporting date [5,40]. 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. Also, 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 significant at the 1% level. Hence, these univariate results for the subsample of stock sales are in favor of the substitution hypothesis.

[18] 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 depository 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.

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 appreciation is significantly larger (10.9%) at firms lacking all anti-shareholder mechanisms. Abnormal stock price patterns after (the announcement of) the sale differ significantly: 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.

Panel C shows the results on the sample of option exercises. In general, we find that the abnormal share price appreciation is significantly greater for option exercises at firms that do not employ a specific anti-shareholder mechanism. Moreover, pre-event CARs are approximately twice as large for firms that do not employ preference shares or priority shares, respectively, compared to their counterparts that do. The difference in the abnormal share price appreciation is four-fold between firms with all possible anti-shareholder mechanisms and without any. However, CARs following option exercises do not exhibit significant differences between subgroups. Therefore, to the extent that pre-transaction CARs are indicative of insiders' trading strategies, the data on option exercises provide some support for the substitution hypothesis.

Taken together, these results suggest that the lack of anti-shareholder mechanisms is associated with more careful timing of insiders' transactions. Even though these patterns appear to be 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 8, 9 and 10 we regress CAR[0,40] for insider purchases, sales and option exercises, 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 simple OLS regression, without controls. In the second column we include firm fixed effects, so that the coefficient on the anti-shareholder index is identified only by firms that change the number of anti-shareholder mechanisms. The third column exhibits differences-in-differences estimates, using the 2004 changes in corporate governance as an exogenous shock to the number of anti-shareholder mechanisms. In the fourth and fifth columns we re-estimate the specifications of the first and third columns, respectively, using an extensive set of controls. Control variables include the position of the insider at the firm, company size, profitability, leverage, the identity of the largest blockholder, and dummy variables capturing the macroeconomic trend. For option exercises, we also control for exercise at or prior to expiration and the retention or sale of the obtained shares.

– Insert Table 8 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. DD estimates buttress this finding, with a coefficient of similar magnitude, significant at the 1% level. The DD regression reveals also that, consistent with our conjecture, the number of anti-shareholder mechanisms had no impact on the CARs after the corporate governance changes of 2004. 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.

The inclusion of control variables in both the basic OLS regression and the DD specification yields coefficients that are not only similar to those found without controls but are to each other (-2.25% for OLS and -2.88% for DD). Moreover, coefficients are significant at the 1% level in both extended regressions. Taken together, when including control variables, we find equally strong empirical support for the substitution hypothesis. Furthermore, results from the DD approach indicate that it is the number of anti-shareholder mechanisms that influences the CARs following insider purchases and not conversely. Moreover, coefficients are also significant economically, an issue which we return to in Section VI.

Coefficients on other covariates indicate that insider type affects the extent to which the share price movements favor the insider. Holding other factors constant, CARs are significantly lower following purchases of supervisory board members compared to those of CEOs and other types of insiders. 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 but is consistent with the substitution hypothesis.

Firm size appears to be positively related to post-purchase CARs, contradicting the conjecture that investors have more information about large firms in general. CARs after purchases appear to decrease with leverage. To the extent that high leverage is a symptom of financial distress and the firm underperforms, we would indeed expect there to be fewer stock price movements that managers can exploit. Abnormal share price patterns after insider purchases are not influenced by the overall trend in the economy.[19,20]

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

[20] 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 9 shows results from the same five regression specifications on the 40-day CAR following insider sales. The baseline OLS regression suggests that following insider sales, CAR[0,40] is significantly positively related to the number of anti-shareholder mechanisms at the firm. After controlling for firm fixed effects, the point estimate of the coefficient is comparable to that found in the OLS setting and is once again significant at the 1% level, suggesting that whenever a firm reduced the number of anti-shareholder mechanisms, CARs following insider sales become more negative. The relationship is still significant with a coefficient of roughly 2 even after including control variables. In sum, the regression results on the subsample of sales provide further support for the substitution hypothesis.

– Insert Table 9 here –

DD estimates lack statistical significance, most likely because the full sample CAAR[0,40] for sales is much smaller in absolute value than for purchases, a result that has been long recognized in the literature. The smaller size of post-sales CARs renders it more difficult to accurately identify drivers of cross-sectional or time-series variation, as evidenced by 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 two 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.

When scrutinizing CARs following option exercises, in Table 10, consistent correlation patterns are hard to ascertain. This is unsurprising as option exercises may be driven by reasons other than private information. Accordingly, and in contrast to stock transactions, it is actually the macroeconomic trend that emerges as a significant driver of CARs after option exercises. CARs are significantly more positive during the economic upturn through September 2000, and more negative during the subsequent decline, which ended in early 2003. The magnitude of the effect of the macroeconomic cycle appears to be symmetrical during these periods, approximately 4.25%.

– Insert Table 10 here –

Although the coefficient on the number of anti-shareholder mechanisms is positive in three out of five specifications and significant in the DD regression without controls (third

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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 25, we find no evidence of this, furthermore, *a priori*, we would expect these changes to have had an impact also on sales and option exercises.

column), it is unclear whether the substitution hypothesis holds also in the case of option exercises. If these transactions are not driven by private information, then our findings regarding substitution of private benefits and insider trading profits should indeed be limited. Notwithstanding, we again provide evidence that blockholder monitoring by the government is quite ineffective: CARs are substantially more negative at firms where the government has the largest stake. Lastly, there is some support for the conjecture that option exercises occurring at vesting are followed by less negative abnormal returns. Although Tables 8, 9 and 10 report only conventional t-statistics, our results are virtually unaltered when using t-statistics based on bootstrapped standard errors.

Previously we have shown that significant negative CARs precede insiders' stock purchases and there is a sizeable abnormal share price run-up before their stock sales and option exercises. In supplementary analysis, we reveal that, in addition to post-transaction CARs, these pre-transaction abnormal stock price movements are also significantly correlated with the number of anti-shareholder mechanisms. In Tables 11, 12 and 13 of the Appendix, we tabulate the same regression specifications as in Table 8, 9 and 10, with the dependent variable is CAR[-40,-1]. The results of these regressions are quite similar to our findings on the post-transaction CARs: the more anti-shareholder mechanisms a firm has, the smaller the abnormal share price movement that favors the insider. DD estimates with and without controls also produce significant results, suggesting that it is indeed firm-specific governance rules that influence CARs preceding insider transactions.

Lastly, in Tables 14 and 15 of the Appendix, we use a measure which combines pre-and post-transaction abnormal returns to more accurately detect the incidence of trading on private information. We construct this variable by dividing the gross cumulative abnormal return over the event window following the transaction by the gross cumulative abnormal return over the event window preceding the transaction. We then take the natural logarithm of this ratio, thereby obtaining a variable which is expected to be positive for purchases (where the stock price first declines then recovers, depicting a "V" shaped pattern) and negative for sales and option exercises (where the price peaks around the transaction and declines afterwards). Thus the dependent variable in our regressions is $\ln R(\tau) = \ln\left(\frac{1+CAR(0;\tau)}{1+CAR(-\tau;-1)}\right)$ where τ is the length of the two event windows (by construction, the pre-event window is always a day shorter).[21] Table 14

[21] This indicator is a modified version of the *PricePattern* measure developed by Rozanov (2008).

exhibits OLS specifications with control variables, whereas Table 15 shows DD regressions. Again, results are consistently in favor of the substitution hypothesis.[22]

Overall, the regression models reinforce 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 more accurate timing by insiders, not less. 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 and option exercises. Hence, the findings of our multivariate analysis also corroborate the substitution hypothesis and go against the monitoring hypothesis.

V. 1. Robustness checks

To eliminate possible sources of spurious correlation, we subject our results to four further robustness checks.

Transactions in months of frequent trading

We examine whether the detected relationship between insider trading, option exercises and corporate governance is driven by transactions in months when the majority of insiders was purchasing (selling) the stock or when there were a large number of insiders exercising their option packages. 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. Lastly, we order months by the number of option exercises that took place and label the top decile as high option exercise months. We then re-estimate the regressions shown in Tables 8, 9 and 10 and add the corresponding binary variable for high net purchase months, high net sale months or high option exercise months to the regressions that feature control variables. Compared to the baseline results reported in the fourth and fifth columns of Tables 8, 9 and 10 this procedure yields quantitatively similar coefficient estimates and identical significance levels.[23] Therefore, we are reassured that

[22] To ensure the robustness of results to the choice of the event window, in untablulated regressions we confirm that our predictions are qualitatively similar when using ln$R$(20). Results are even stronger if we use a modified version of ln$R$(40), where the post-event gross CAR is calculated over the window [5;40] so that it spans a period where the transaction is revealed to all investors.
[23] Results are available upon request.

that our main results hold equally in periods of intensive insider purchasing, selling and option exercising.

Clustering of option exercises

To ascertain the robustness of our findings on option exercises, we delve into exercises by insiders at the same company. Thus far, we have argued that insiders are able to time their option exercises to the market, realizing a significant abnormal return on the transaction. If this is the case, then it is also plausible that *more* insiders at a given firm take advantage of the favorable price movements. Hence, exercises may occur in groups rather than in a random fashion over time. When more insiders of the same company exercise their option packages on the same day, the signal sent to the market is clearer. Furthermore, there are no complications in identifying the event day and no overlapping event windows. Although we initially find that multiple insider exercises are timed more carefully than standalone transactions, this difference vanishes once we exclude exercises that occur at vesting or at expiration, which are arguably natural clustering dates.[24]

Informational opaqueness

One possible mechanism that may explain the difference between the CARs following insider transactions is that firms with strong corporate governance are more transparent. 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).

Notwithstanding, we choose to examine empirically whether informational opaqueness can, in part, explain our results. To this end, we gather information on earnings announcements and use changes in stock price volatility around these events to capture informational opaqueness. Our proxy is defined as the percentage change in the 10-day realized stock return volatility before

[24] Tables are available upon request.

and after the earnings announcement. To eliminate idiosyncratic effects, we consider three-year moving averages of this measure by averaging over all earnings announcements in a given year, the previous year and the following year. We then add this proxy to the regressions in the fourth (OLS with controls) and fifth (DD with controls) columns of Tables 8, 9 and 10. We find that the change in volatility around earnings announcements does not enter significantly in any of the regressions. We conclude that informational opaqueness cannot explain the variation in CARs following insider transactions.

Liquidity

One further concern regarding the interpretation of our results is that 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 8, 9 and 10. Our results (untabulated) indicate that although turnover is significantly correlated with post-event CARs in the case of purchases and option exercises, coefficient estimates and significance levels for the anti-shareholder index are unchanged by the inclusion of this control variable.

VI. Estimating the value of private benefits

In Section V, we have shown that CARs are higher after insider purchases and lower following sales and option exercises 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 transaction 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 and option exercises 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.[25] We base our estimates on the coefficient in the fourth column of Table 8, although point estimates are remarkably 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 €13,397. 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, thereby creating 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 consider the total value of entrenchment over our sample period of ten years at a firm which is

[25] 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.

average according to all measures in our sample. This means that the firm employs two anti-shareholder mechanisms (the sample average and median, as reported in Table 2) and the firm's insiders perform the sample average number of purchases (calculated as the total number of purchases, divided by the number of firms in the purchase subsample, reported in Panel A of Table 1). Then, throughout our sample of ten years, *each* of the two anti-shareholder mechanisms would be worth €98,669 to these corporate insiders, hence the total value of entrenchment at the average firm in our sample (which has two anti-shareholder devices) would equal €197,338. Moreover, based on our estimation procedure, employing the regulatory maximum of 3 anti-shareholder devices results in entrenchment benefits of €296,007.[26]

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 specifications in the third and fifth columns of Table 8 confirm 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.

VII. 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 option exercises, and establishes their connection to several aspects of corporate governance: governance rules (as measured by the anti-shareholder mechanisms) and blockholder concentration. We examine a sample of insider

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[26] These figures are calculated as $a * B_{buy} * \frac{n_{buy}}{f_{buy}}$, where a is the number of anti-shareholder devices employed, n_{buy} is the total number of transactions in a subsample (purchases, sales, options), f_{buy} is the number of firms in the subsample, the fraction is the average number of transactions at a firm over our sample period and B_{buy} is the benefit calculated in the previous step, equal to $|\beta| pq$.

trades and option exercises 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

Our results show that insiders earn a cumulative abnormal return of 3.46% following purchases, however, the price does not move in their favor following stock sales and option exercises. To better understand if these returns are due to timing or simply purchasing after the stock has been appreciating for a certain period, we also look at abnormal returns preceding insider transactions. We discern a 5% abnormal depreciation of the share price over the 40-day window before purchases. We also observe a similar appreciation before sales, and an abnormal climb in excess of 8% prior to option exercises. Our analysis reveals also that abnormal share price appreciation after CEO purchases is roughly 5%, whereas the abnormal loss following a CEO stock sale is in excess of -10%. In line with an information hierarchy among insiders, abnormal stock price movements are less sharp following transactions of executive board members other than the CEO, supervisory board members and other insiders.

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, depository receipts, and the structured regime influence abnormal stock price patterns around insider trading and option exercises. Our baseline hypothesis on this relationship is 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. 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 strongest for insider purchases, consistent with the notion supported by previous empirical work that sales may be motivated by liquidity or diversification motives.

The paper contributes to the extant 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 uses the 2004 changes in Dutch corporate governance regulations as quasi-natural experiment which shifts corporate governance rules. Our findings indicate that as

firms did away with shareholder-unfriendly governance structures, profits to insider purchases did indeed increase.

These results are unanimously 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. In contrast, we observe that insiders at companies with several anti-shareholder mechanisms earn significantly lower abnormal returns following their trades. 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, insiders cannot (or to a lesser extent) 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 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.

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 private benefits is approximately €13,397 for share purchases per year, per anti-shareholder mechanism. Based on the number of insider purchases and anti-shareholder mechanisms at our sample firms, the average company's insiders enjoy private benefits worth just under €300,000.

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Table 1: Descriptive statistics

Panel A reports statistics for the full sample. The sample is partitioned by exercise time (early, at expiration, on or after the vesting date). An early exercise is defined as an exercise with more than 30 days to expiration, when the exact expiration dates are known. When the exact dates are unknown and only the year of expiration (vesting) is available, an exercise at expiration is defined as any exercise that occurs in the year of expiration (vesting). Of the 1,392 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 the 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 transaction year and type of insider. 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 works 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 exercises	Number of firms	Number of insiders	Transaction value		Mean (median) % of stocks sold		Mean (median) years prior to expiration	
				mean	median				
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	-	-
Insider purchases	663	90	339	595,437	20,113				
Insider sales	739	86	349	438,618	63,000				

Table 1 - continued

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
Full Sample	663	739	1,392	595,437	20,113	438,618	63,000	169,358	47,120	86.45	100	2.17	1.83
1999	69	83	109	386,835	59,000	358,050	57,532	109,925	37,800	79.29	100	2.11	2.33
2000	132	122	248	465,159	25,003	711,075	80,300	325,483	68,666	88.03	100	2.25	2.08
2001	122	96	211	459,078	17,370	436,635	64,500	145,242	28,680	87.96	100	1.53	1.00
2002	89	88	99	278,754	19,891	693,811	90,502	145,860	38,540	80.42	100	0.86	0.75
2003	43	53	62	217,329	11,291	257,411	52,200	211,797	24,031	72.58	100	0.91	0
2004	60	77	106	2,810,560	22,175	91,900	40,250	74,449	24,062	87.86	100	2.18	1.17
2005	41	76	158	666,459	13,500	198,521	44,007	73,034	31,231	86.69	100	2.51	1.75
2006	82	81	312	243,000	17,323	394,492	156,340	151,434	83,240	89.09	100	2.71	2.00
2007	25	63	87	13,824	6,375	583,291	48,430	205,780	120,557	93.00	100	2.58	1.25
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

	Number of purchases	Number of sales	Number of option exercises
None	45	53	83
Structured regime only	66	97	36
Preference shares only	83	124	353
Priority shares only	14	7	34
Depositary receipts only	1	0	13
Structured regime and preference shares	104	68	321
Structured regime and priority shares	17	1	1
Structured regime and depositary receipts	1	0	3
Preference shares and priority shares	17	44	68
Preference shares and depositary receipts	22	35	208
Priority shares and depositary receipts	0	0	0
Three anti-shareholder mechanisms	161	208	76

Correlation matrix - purchases

	Structured regime	Preference shares	Priority shares	Depositary receipts
Structured regime	1	.	.	.
Priority shares	0.0950	1	.	.
Preference shares	0.2242	0.1304	1	.
Depositary receipts	0.0116	0.2127	-0.2160	1

Correlation matrix - sales

	Structured regime	Preference shares	Priority shares	Depositary receipts
Structured regime	1	.	.	.
Priority shares	-0.0386	1	.	.
Preference shares	0.1913	0.3109	1	.
Depositary receipts	0.1391	0.2866	-0.1364	1

Correlation matrix - option exercises

	Structured regime	Preference shares	Priority shares	Depositary receipts
Structured regime	1	.	.	.
Priority shares	0.1644	1	.	.
Preference shares	0.089	-0.0416	1	.
Depositary receipts	-0.0629	0.145	-0.267	1

Table 3: 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 3,000 resamplings. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

PURCHASES *n=663*				**SALES** *n=739*				**OPTION EXERCISES** *n=1,392*			
Panel A: Abnormal returns											
Event window	Mean %	t-statistic	bootstrapped t significance	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***		0	0.25	3.73***	
1	0.40	2.92***		1	0.21	1.86*		1	-0.18	-3.05***	
2	0.41	3.43***		2	-0.09	-0.91		2	0.04	0.74	
3	-0.04	-0.12		3	0.01	0.12		3	0.05	0.85	
4	-0.08	-0.62		4	0.12	1.15		4	0.05	0.89	
5	0.07	0.60		5	0.10	1.10		5	-0.01	-0.11	
6	0.19	1.47		6	-0.12	-1.12		6	0	0.04	
7	-0.09	-0.15		7	-0.08	-0.76		7	-0.12	-1.96**	
8	-0.15	-1.29		8	0.11	1.06		8	-0.06	-0.98	
9	0.14	1.19		9	-0.15	-1.66*		9	0.1	1.64	
10	-0.01	-0.08		10	-0.10	-1.33		10	0.02	0.39	
Panel B: Cumulative Average Abnormal Returns											
[-40,-1]	-4.55	-5.33***	***	[-40,-1]	5.53	7.08***	***	[-40,-1]	8.34	20.36***	***
[0,1]	0.52	2.59***	***	[0,1]	0.66	2.74***	***	[0,1]	0.06	0.73	
[0,5]	0.87	3.05***	***	[0,5]	0.81	2.82***	***	[0,5]	0.2	1.37	*
[0,40]	3.46	5.47***	***	[0,40]	-0.44	-0.63		[0,40]	1.17	3.01***	***
[5,8]	0.16	0.72		[5,8]	0.02	0.13		[5,8]	-0.18	-1.4	*
[5,40]	2.67	4.48***	***	[5,40]	-1.14	-1.84*	**	[5,40]	0.96	2.79***	***

Table 4: Cumulative abnormal returns around insider transactions grouped by the type of insider performing the transaction

This table reports the CAARs around insider purchases and sales, for the transactions partitioned according to the type of insider involved. The categories are: CEOs, Executive Board Members, Supervisory Board Members and Other Insiders with a duty to report their trade. Other insiders include large shareholders, the executive 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. Abnormal returns are estimated with the CAPM, using the Amsterdam Exchanges All-Share Index as market index. Day 5 is assumed to be the announcement date. Bootstrapped t-statistics are calculated based on 3,000 resamplings. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

Event window	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic
						PURCHASES						
	CEOs (n=115)			*Executive board members (n=98)*			*Supervisory board members (n=113)*			*Others (n=337)*		
[-40,-1]	-10.90	-4.19***	***	-2.99	-1.51	*	-1.23	-0.88		-3.96	3.29***	***
[0,1]	0.91	1.65	*	0.49	0.80		0.35	0.76		0.46	1.76*	**
[0,5]	0.77	0.96		1.33	1.52	*	-0.37	-0.71		1.19	3.09***	***
[0,40]	4.87	2.97***	***	3.64	2.03**	**	2.46	1.98**	**	3.26	3.66***	***
[5,8]	0.51	0.84	.	-0.05	-0.12		-0.19	-0.52		0.22	0.64	
[5,40]	3.96	2.67***	***	1.93	1.21		2.64	2.15**	**	2.46	2.86***	***
						SALES						
	CEOs (n=70)			*Executive board members (n=88)*			*Supervisory board members (n=61)*			*Others (n=520)*		
[-40,-1]	10.20	2.58**	***	4.51	2.24**	***	3.68	1.15		5.28	6.36***	***
[0,1]	-1.25	-1.55	*	0.98	1.81*	**	0.71	1.10		0.85	2.85***	***
[0,5]	-1.32	-1.36	*	0.41	0.65		1.06	1.19		1.13	3.21***	***
[0,40]	-10.36	-3.02***	***	1.26	0.72		-1.98	-1.13		0.79	1.00	
[5,8]	-1.16	-1.99*	*	-0.08	-0.20		0.71	1.23		0.12	0.51	
[5,40]	-9.02	-2.61**	***	0.88	0.57		-2.23	-1.24		-0.30	-0.44	
						OPTION EXERCISES						
	CEOs (n=44)			*Executive board members (n=148)*			*Supervisory board members (n=26)*			*Others (n=1174)*		
[-40,-1]	6.36	2.19**	**	6.4	4.55***	***	14.31	4.31***	***	8.53	19.73***	***
[0,1]	0.05	0.1		-0.21	-0.71		0.16	0.19		0.1	1.03	
[0,5]	-0.38	-0.26		0.17	0.35		1.35	1.22		0.2	1.33	
[0,40]	-0.62	-0.21		1.11	0.95		5.19	1.61		1.15	2.77***	***
[5,8]	-2.00	-1.50		-0.02	-0.04		1.38	1.06		-0.17	-1.26	
[5,40]	-1.00	-0.42		0.86	0.76		4.12	1.28		0.98	2.67***	**

Table 5: Differences in cumulative abnormal return patterns by insider type

This table shows the results of two-sample comparison tests between the means of cumulative abnormal returns before and after transactions by insiders, where the subsamples are created by insider type. A + (-) indicates that the CAAR for the group listed in the row, to the left, was significantly higher (lower) than the CAAR for the group listed in the column, at the top. The number of + (-) signs corresponds to the level of significance with 1, 2 and 3 signs indicating significance at the 10%, 5% and 1% level, respectively. The equality of variances among the two groups was tested prior to the mean comparison test, and the appropriate version (equal or unequal variances) of the mean comparison test was implemented. Data are from the period 1999-2007.

Purchases

		CEO		Executive board		Supervisory board	
		[-40,-1]	[5,40]	[-40,-1]	[5,40]	[-40,-1]	[5,40]
CEO	[-40,-1]						
	[5,40]						
Executive board	[-40,-1]	+ + +					
	[5,40]		n.s.				
Supervisory board	[-40,-1]	+ + +		n.s.			
	[5,40]		n.s.		n.s.		
Others	[-40,-1]	+ + +		n.s.		–	
	[5,40]		n.s.		n.s.		n.s.

Sales

		CEO		Executive board		Supervisory board	
		[-40,-1]	[5,40]	[-40,-1]	[5,40]	[-40,-1]	[5,40]
CEO	[-40,-1]						
	[5,40]						
Executive board	[-40,-1]	–					
	[5,40]		+ + +				
Supervisory board	[-40,-1]	n.s.		n.s.			
	[5,40]		+		–		
Others	[-40,-1]	n.s.		n.s.		n.s.	
	[5,40]		+ + +		n.s.		n.s.

Option exercises

		CEO		Executive board		Supervisory board	
		[-40,-1]	[5,40]	[-40,-1]	[5,40]	[-40,-1]	[5,40]
CEO	[-40,-1]						
	[5,40]						
Executive board	[-40,-1]	n.s.					
	[5,40]		n.s.				
Supervisory board	[-40,-1]	+		+ +			
	[5,40]		n.s.		n.s.		
Others	[-40,-1]	n.s.		n.s.		–	
	[5,40]		n.s.		n.s.		n.s.

Table 6: Cumulative abnormal returns - exercises at vesting, between vesting and expiration and at expiration

This table reports the cumulative average abnormal returns around option exercises and the corresponding t-statistics and Wilcoxon rank-sum statistics for the exercises at vesting, between vesting and expiration and at expiration. Abnormal returns are estimated with the CAPM-model, using the Amsterdam Exchanges All-Share Index as market index. These results apply to the sample of option exercises for which the vesting date is known (n=1,180). Options exercised on the vesting date are those exercised between zero and 30 days after the vesting date, when the exact expiration dates are known. For part of the sample only the year of vesting (expiration) is available. In these cases, an exercise at the vesting (expiration) date is defined as any exercise that occurs in the year of vesting (expiration). Day 5 is assumed to be the announcement date. Bootstrapped t-statistics are calculated based on 3,000 resamplings. ***, **, * represent the 1%, 5% and 10% two-tailed significance respectively. Data are from the period 1999-2007.

	Exercises at vesting (n=228)			*Exercises between vesting and expiration (n=737)*			*Exercises at expiration (n=215)*		
Day	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic	CAAR %	t-statistic	bootstrapped t-statistic
[-40,-1]	8.94	9.82***	***	9.64	16.05***	***	4.85	6.44***	***.
[0,1]	-0.14	-0.73		0.20	1.49		-0.14	-0.98	
[0,5]	0.11	0.34		0.24	1.10		0.17	0.50	
[0,40]	1.37	2.29**	**	1.02	1.76*	*	1.39	1.74*	*
[5,8]	0.36	1.56		-0.38	-1.90*	*	-0.60	-1.90*	
[5,40]	1.63	3.01***	***	0.62	1.24		1.13	1.59	

	Difference at vesting and between vesting and expiration			*Difference at vesting and at expiration*			*Difference between vesting and expiration and at expiration*		
Day	t-statistic difference	bootstrapped t-statistic difference	Wilcoxon Z-statistic difference	t-statistic difference	bootstrapped t-statistic difference	Wilcoxon Z-statistic difference	t-statistic difference	bootstrapped t-statistic difference	Wilcoxon Z-statistic difference
[-40,-1]	-0.64		-0.98	3.46***	***	2.26**	4.96***	***	4.41***
[0,1]	-1.47	*	-1.28	0.01		-0.36	1.74*	**	0.90
[0,5]	-0.35		-1.76*	-0.13		-1.49	0.18		0.41
[0,40]	0.42		1.35	-0.02		1.17	-0.38		-0.44
[5,8]	2.42**	***	1.04	2.45**	**	1.59	0.59		0.86
[5,40]	1.37	*	2.93***	0.56		1.86*	-0.59		-0.93

Table 7: 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. Note that firms may not employ preference shares, priority shares and depository 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 3,000 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=387)			*No preference shares (n=144)*				*Difference*	
[-40,-1]	-4.94	-4.31***	***	-6.00	-3.20***	***	-0.48		0.59
[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=167)			*No priority shares (n=364)*				*Difference*	
[-40,-1]	0.14	0.09	.	-7.70	-6.23***	***	-4.07***	***	-2.45**
[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=349)			*No structured regime (n=182)*				*Difference*	
[-40,-1]	-2.54	-2.81***	***	-10.40	-4.67***	***	-3.27***	***	-2.00**
[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
	Depository receipts (n=81)			*No depository receipts (n=582)*				*Difference*	
[-40,-1]	-5.79	-2.98***	***	-4.38	-4.70***	***	0.58		0.75
[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=161)			*No anti-shareholder mechanisms (n=166)*				*Difference*	
[-40,-1]	-0.98	-0.62		-5.14	-2.66***	***	-1.66*	*	-0.69
[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 7 - 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=479)			*No preference shares (n=159)*				*Difference*	
[-40,-1]	3.65	5.01***	***	11.75	4.45***	***	2.96***		1.14
[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=190)			*No priority shares (n=448)*				*Difference*	
[-40,-1]	1.31	1.27	*	7.52	6.59***	***	4.02***	***	4.04***
[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=375)			*No structured regime (n=263)*				*Difference*	
[-40,-1]	4.27	4.31***	***	7.67	4.95***	***	1.85*		0.68
[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**
	Depository receipts (n=127)			*No depository receipts (n=511)*				*Difference*	
[-40,-1]	4.16	3.56***	***	5.80	6.29***	***	1.24		-1.22
[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=208)			*No anti-shareholder mechanisms (n=154)*				*Difference*	
[-40,-1]	2.83	3.84***	***	10.91	5.32***	***	3.70***	***	1.80*
[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 7 - continued

Panel C: Option exercises									
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=1222)			*No preference shares (n=170)*				*Difference*	
[-40, -1]	7.22	20.01***	***	16.46	8.11***	***	-4.48***	***	-3.74***
[0,1]	-0.05	-0.52		0.85	2.38**	**	-2.43**	**	-2.61***
[0,5]	0.00	0.01		1.64	2.83***	***	-2.74***	***	-2.73***
[0,40]	0.70	2.26**	**	4.51	2.01**	**	-1.68*		-0.99
[5,8]	-0.27	-1.89*	*	0.41	1.19		-1.82*	*	-1.69*
[5,40]	0.65	2.35**	**	3.16	1.59		-1.25		0.01
	Priority shares (n=229)			*No priority shares (n=1163)*				*Difference*	
[-40, -1]	4.93	9.36***	***	9.02	19.07***	***	-5.25***	***	-3.01***
[0,1]	0.25	1.49		0.03	0.27		1.14		0.93
[0,5]	0.59	2.04**	**	0.13	0.76		1.38		0.30
[0,40]	0.86	1.37		1.23	2.75***	***	-0.48		-0.13
[5,8]	0.40	1.79*	*	-0.30	-1.98**	**	2.60***	**	1.54
[5,40]	0.37	0.59		1.08	2.73***	***	-0.97		-0.65
	Structured regime (n=633)			*No structured regime (n=759)*				*Difference*	
[-40, -1]	6.70	13.79***	***	9.72	15.44***	***	-3.80***	***	-3.38***
[0,1]	0.13	1.28		0.01	0.08		0.69		0.76
[0,5]	0.27	1.76*	*	0.15	0.62		0.41		0.50
[0,40]	1.61	4.08***	***	0.81	1.28		1.07		3.41***
[5,8]	0.03	0.23		-0.36	-1.68*		1.56		0.62
[5,40]	1.32	3.59***	***	0.66	1.19		1.00		3.59***
	Depository receipts (n=370)			*No depository receipts (n=1022)*				*Difference*	
[-40, -1]	7.99	15.01***	***	8.47	16.17***	***	-0.64		1.02
[0,1]	0.33	2.31**	**	-0.03	-0.30		2.03**	**	1.46
[0,5]	0.78	3.67***	***	-0.01	-0.03		2.77***	***	2.78***
[0,40]	0.40	0.79		1.45	2.92***	***	-1.49		-1.61
[5,8]	-0.11	-0.70		-0.21	-1.25		0.44		0.32
[5,40]	-0.49	-1.03		1.48	3.41***	***	-3.06***	***	-3.47***
	Three anti-shareholder mechanisms (n=272)			*No anti-shareholder mechanisms (n=83)*				*Difference*	
[-40, -1]	6.09	9.63***	***	26.07	7.04***	***	-5.31***	***	-5.54***
[0,1]	0.34	2.33**	**	1.18	1.74*	*	-1.21		-1.24
[0,5]	0.41	1.86*	*	3.05	2.78***	**	-2.35**	**	-2.97***
[0,40]	2.03	3.46***	***	10.28	2.35**	**	-1.87*	*	-1.90*
[5,8]	-0.06	-0.31		0.15	0.24		-0.32		0.14
[5,40]	1.48	2.84***	***	7.77	2.04**	**	-1.63		-0.71

Table 8: Cross-sectional determinants of abnormal return patterns following insider purchases

Type of insider dummies are binary variables that equal one if the insider 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. 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. ROE and leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.
Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * 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		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	4.72	3.92***	7.14	4.20***	0.06	0.05	-6.93	-0.92	-16.32	-2.14**
Anti-shareholder mechanisms in place										
Anti-shareholder index	-0.76	-1.30	-2.21	-2.18**	0.80	1.37	-2.25	-3.13***	-0.54	-0.63
Corporate governance regime										
Until 2004					7.20	3.60***			8.88	4.26***
Until 2004 * anti-shareholder index					-2.50	-2.61***			-2.88	-2.61***
Type of Insider										
CEO							1.36	0.74	0.69	0.39
Executive board							-0.73	-0.37	-1.59	-0.86
Supervisory							-3.09	-1.95*	-3.51	-2.22**
Largest stake in the company										
Directors							-3.02	-0.95	-1.41	-0.43
Financial companies							3.19	1.16	5.24	1.79*
Families or individuals							-0.42	-0.14	0.85	0.28
Ind./Com. Companies							16.17	3.76***	17.59	4.12***
Government							13.69	3.77***	15.65	4.34***
Accounting data										
Firm size (ln market cap)							0.54	1.82*	0.69	2.42**
ROE							-0.06	-2.64***	-0.06	-2.79***
Leverage							1.66	0.86	1.63	0.82
Economic trend										
Growth 1-4-99 to 4-9-00							1.12	0.67		
Decline 5-9-00 to 12-03-03							1.24	0.71		
Number of observations	663		663		663		663		663	
Adjusted R^2	0.23%		30.36%		1.08%		10.97%		12.79%	

Table 9: Cross-sectional determinants of abnormal return patterns following insider sales

Type of insider dummies are binary variables that equal one if the insider 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. 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. ROE and leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.

Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * 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		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-4.20	-2.36**	-5.22	-2.15**	-1.88	-1.53	-18.89	-1.71*	-21.54	-1.83*
Anti-shareholder mechanisms in place										
Anti-shareholder index	2.22	2.97***	2.81	2.10***	1.65	2.33**	1.80	2.26**	0.82	1.06
Corporate governance regime										
Until 2004					-3.53	-1.26			-0.98	-0.31
Until 2004 * anti-shareholder index					0.87	0.72			0.85	0.69
Type of Insider										
CEO							-8.23	-2.29**	-8.20	-2.39**
Executive board							-0.44	-0.21	-1.12	-0.60
Supervisory							-2.50	-1.03	-3.60	-1.57
Largest stake in the company										
Directors							-3.94	-1.09	-2.98	-0.80
Financial companies							0.39	0.11	1.25	0.34
Families or individuals							1.60	0.23	3.10	0.41
Ind./Com. Companies							1.25	0.19	2.53	0.37
Government							-10.05	-1.17	-9.77	-1.12
Accounting data										
Firm size (ln market cap)							0.89	2.05**	1.02	2.25**
ROE							0.00	-0.17	0.00	-0.06
Leverage							2.51	1.38	2.76	1.40
Economic trend										
Growth 1-4-99 to 4-9-00							0.82	0.31		
Decline 5-9-00 to 12-03-03							-2.47	-1.35		
Number of observations	739		739		739		739		739	
Adjusted R^2	1.41%		16.81%		1.45%		5.90%		5.53%	

Table 10: Cross-sectional determinants of abnormal return patterns following insider option exercises

Type of insider dummies are binary variables that equal one if the insider performs a function of the corresponding type at the time of exercise. CEOs are excluded from the category Executive Board. The base category is 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. ROE and Leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.

Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * 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		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	3.27	2.20**	-4.19	-0.64	-4.20	-2.47**	14.17	1.60	5.84	0.74
Anti-shareholder mechanisms in place										
Anti-shareholder index	-1.28	-1.72*	3.27	0.81	3.29	3.66***	-0.26	-0.25	1.20	1.53
Corporate governance regime										
Until 2004					10.70	3.57***			5.25	1.48
Until 2004 * anti-shareholder index					-5.99	-4.27***			-3.39	-2.04**
Type of Insider										
CEO							-1.55	-0.46	-1.55	-0.44
Executive board							-1.98	-0.96	-1.97	-0.98
Supervisory							-3.71	-1.14	-5.56	-1.88*
Largest stake in the company										
Directors							-6.01	-2.01	-4.73	-1.59
Financial companies							-8.75	-3.09***	-7.60	-2.68**
Families or individuals							-10.42	-1.80*	-8.95	-1.49
Ind./Com. Companies							0.59	0.10	0.79	0.13
Government							-12.83	-2.80***	-12.05	-2.70***

Table 10: Cross-sectional determinants of abnormal return patterns following insider option exercises - continued

	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Accounting data										
Firm size (ln market cap)							0.01	0.04	0.25	0.79
ROE							-0.14	-5.46***	-0.15	-5.21***
Leverage							-0.04	-0.73	-0.05	-0.98
Economic trend										
Growth 1-4-99 to 4-9-00							4.24	2.30**		
Decline 5-9-00 to 12-03-03							-4.28	-3.31***		
Exercise characteristics										
Exercise at vesting							1.39	1.42	2.49	2.73***
Exercise at expiration							0.89	0.72	0.20	0.15
Full sale of acquired shares							0.74	0.41	0.78	0.42
Firm FE			YES							
Number of observations	1392		1392		1392		1392		1392	
Adjusted R^2	0.43%		25.59%		2.46%		10.74%		8.24%	

Appendix

Table 11: Cross-sectional determinants of abnormal return patterns preceding insider purchases

Type of insider dummies are binary variables that equal one if the insider 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. 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. ROE and leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.
Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: CAR[-40,-1]									
	OLS		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-6.91	-3.58***	-1.16	-0.48	1.39	0.93	0.40	0.03	3.58	0.26
Anti-shareholder mechanisms in place										
Anti-shareholder index	1.42	1.55	-2.04	-1.42	0.59	0.66	5.07	4.42***	1.53	1.38
Corporate governance regime										
Until 2004					-13.43	-4.23***			-16.97	-6.25***
Until 2004 * anti-shareholder index					2.48	1.63			4.17	2.95***
Type of Insider										
CEO							0.08	0.03	-4.88	-1.78*
Executive board							8.22	3.28***	5.42	2.30**
Supervisory board							8.98	3.95***	7.01	3.11***
Largest stake in the company										
Directors							-8.89	-1.36	-12.23	-1.86*
Financial companies							-17.03	-2.91***	-19.05	-3.22***
Families or individuals							-12.37	-1.93*	-5.58	-0.90
Ind./Com. Companies							-1.58	-0.24	-6.07	-0.93
Government							-20.70	-2.85**	-25.88	-3.47***
Accounting data										
Firm size (ln market cap)							0.23	0.51	0.53	1.16
ROE							-0.02	-0.79	-0.03	-1.11
Leverage							9.01	3.40***	6.23	2.29**
Economic trend										
Growth 1-4-99 to 4-9-00							-18.52	-6.90***		
Decline 5-9-00 to 12-03-03							-15.53	-7.00***		
Number of observations	663		663		663		663		663	
Adjusted R^2	0.27%		47.29%		3.65%		14.55%		11.46%	

Table 12: Cross-sectional determinants of abnormal return patterns preceding insider sales

Type of insider dummies are binary variables that equal one if the insider 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. 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. ROE and leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.
Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: CAR[-40,-1]									
	OLS		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	10.11	5.52***	5.49	1.96*	3.83	2.60***	-34.47	-3.09***	-44.98	-3.96***
Anti-shareholder mechanisms in place										
Anti-shareholder index	-2.70	-3.64***	0.03	0.01	0.70	0.83	-3.01	-4.08***	-0.39	-0.41
Corporate governance regime										
Until 2004					8.54	2.89***			11.56	3.66***
Until 2004 * anti-shareholder index					-4.32	-3.39***			-4.90	-3.28***
Type of Insider										
CEO							0.90	0.24	2.31	0.63
Executive board							-2.85	-1.24	-2.13	-0.95
Supervisory board							-1.83	-0.57	-3.17	-0.94
Largest stake in the company										
Directors							15.75	5.23***	17.49	5.42***
Financial companies							14.62	5.32***	16.94	5.33***
Families or individuals							-1.55	-0.14	3.99	0.42
Ind./Com. Companies							28.31	4.20***	31.09	4.43***
Government							6.30	1.51	9.39	2.82***
Accounting data										
Firm size (ln market cap)							1.72	3.55***	1.87	3.92***
ROE							-0.11	-3.95***	-0.08	-3.50***
Leverage							-6.26	-3.49***	-7.05	-3.68***
Economic trend										
Growth 1-4-99 to 4-9-00							10.81	2.79***		
Decline 5-9-00 to 12-03-03							1.11	0.66		
Number of observations	739		739		739		739		739	
Adjusted R^2	1.70%		27.95%		2.31%		10.18%		9.60%	

Table 13: Cross-sectional determinants of abnormal return patterns preceding insider option exercises

Type of insider dummies are binary variables that equal one if the insider performs a function of the corresponding type at the time of exercise. CEOs are excluded from the category Executive Board. The base category is 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. ROE and Leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.

Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: CAR[-40,-1]									
	OLS		OLS with firm FE		DD		OLS		DD	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	14.46	9.89***	3.12	0.97	8.09	8.93***	36.40	4.18***	20.11	2.44**
Anti-shareholder mechanisms in place										
Anti-shareholder index	-3.47	-5.07***	2.96	1.60	-0.79	-1.58	-2.30	-2.01**	0.05	0.06
Corporate governance regime										
Until 2004					11.63	4.52***			14.54	3.60***
Until 2004 * anti-shareholder index					-4.66	-4.02***			-5.84	-3.09***
Type of Insider										
CEO							-4.62	-1.23	-4.66	-1.24
Executive board							-3.62	-1.87*	-3.26	-1.66*
Supervisory board							2.67	0.57	0.00	0.00
Largest stake in the company										
Directors							-5.11	-1.51	-2.28	-0.62
Financial companies							-2.73	-0.87	0.24	0.07
Families or individuals							-10.67	-1.43	-7.40	-0.87
Ind./Com. Companies							10.04	2.07**	11.51	2.07**
Government							3.33	0.79	3.58	0.85

Table 13: Cross-sectional determinants of abnormal return patterns preceding insider option exercises - continued

	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Accounting data										
Firm size (ln market cap)							-1.03	-3.27***	-0.61	-1.93*
ROE							0.01	0.43	0.02	0.81
Leverage							-0.11	-2.15**	-0.12	-2.25**
Economic trend										
Growth 1-4-99 to 4-9-00							12.68	5.84***		
Decline 5-9-00 to 12-03-03							-1.97	-1.6		
Exercise characteristics										
Exercise at vesting							-2.80	-2.22**	-0.96	-0.76
Exercise at expiration							-2.50	-1.86*	-4.32	-3.29***
Full sale of acquired shares							3.00	1.31	2.99	1.26
Number of observations	1392		1392		1392		1392		1392	
Adjusted R^2	3.48%		29.46%		6.17%		18.30%		11.70%	

Table 14: Cross-sectional determinants of abnormal return patterns around insider transactions

The dependent variable is ln*R*(40), defined as the natural logarithm of the ratio (1+CAR[0;40])/(1+CAR[-40;-1]) Type of insider dummies (CEO, Executive board and Supervisory board) are binary variables that equal one if an insider performs a function of the corresponding type at the time of exercise. CEOs are excluded from the category Executive Board. 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. ROE and Leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.
Ownership 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. The economic trend dummies of economic growth and economic decline: 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 clustered at the firm level. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: ln*R*(40)					
	PURCHASES		**SALES**		**OPTION EXERCISES**	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.020	0.11	0.148	0.97	-0.197	-1.99**
Type of Insider						
CEO	0.073	1.38	-0.124	-1.51	0.033	0.84
Executive board	-0.104	-2.96***	0.041	1.3	0.013	0.56
Supervisory	-0.146	-3.81***	-0.001	-0.02	-0.034	-0.62
Anti-shareholder mechanisms in place						
Anti-shareholder index	-0.095	-3.9***	0.038	3.91***	0.032	2.82***
Largest stake in the company						
Directors	0.057	0.72	-0.212	-3.27***	-0.017	-0.53
Financial companies	0.232	3.33***	-0.135	-2.73***	-0.066	-2.39**
Families or individuals	0.125	1.68*	0.043	0.23	-0.011	-0.11
Ind./Com. Companies	0.142	1.85*	-0.243	-3.1***	-0.140	-2.05**
Government	0.413	4.4***	-0.182	-1.45	-0.176	-3.03***
Accounting data						
Firm size (ln market cap)	0.000	0.03	-0.008	-1.23	0.010	2.69***
ROE	-0.001	-1.05	0.002	2.72***	-0.002	-5.23***
Leverage	-0.125	-2.59***	0.113	3.72***	0.001	1.12
Economic trend						
Growth 1-4-99 to 4-9-00	0.190	5.92***	-0.140	-4.36***	0.009	0.37
Decline 5-9-00 to 12-03-03	0.220	5.53***	-0.026	-0.65	-0.068	-3.92***
Exercise characteristics						
Exercise at vesting					0.019	1.32
Exercise at expiration					0.045	2.83***
Full sale of acquired shares					-0.027	-0.99
Mean of dependent variable	0.098		-0.066		-0.081	
Std of dependent variable	0.365		0.363		0.200	
Number of observations	651		724		858	
Adjusted R^2	12.49%		11.84%		8.74%	

Table 15: Cross-sectional determinants of abnormal return patterns around insider transactions: the effect of corporate governance changes in 2004

The dependent variable is lnR(40), defined as the natural logarithm of the ratio (1+CAR[0;40])/(1+CAR[-40;-1]). Type of insider dummies are binary variables that equal one if the insider performs a function of the corresponding type at the time of exercise. CEOs are excluded from the category Executive Board. The base category is 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. ROE and Leverage are the return on equity and debt-to-equity ratio at the end of the year, respectively.
Ownership 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. Until 2004 is a binary variable that takes value 1 if the transaction occurred in 2004 or earlier.. T-statistics are calculated based on Huber-White standard errors clustered at the firm level. ***, **, * represent two-tailed significance at the 1%, 5% and 10% level, respectively. Data are from the period 1999-2007.

	Dependent variable: ln*R*(40)					
	PURCHASES		**SALES**		**OPTION EXERCISES**	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-0.110	-0.62	0.246	1.58	-0.124	-1.29
Type of Insider						
CEO	0.126	2.22**	-0.173	-2.10**	0.029	0.75
Executive board	-0.075	-2.31**	0.015	0.55	0.012	0.52
Supervisory	-0.113	-3.17***	0.007	0.16	-0.052	-1.07
Anti-shareholder mechanisms in place						
Anti-shareholder index	-0.016	-0.97	0.010	0.95	-0.006	-0.5
Corporate governance regime						
Until 2004	0.292	5.99***	-0.138	-3.28***	-0.107	-3.06***
Until 2004 * anti-shareholder index	-0.084	-3.36***	0.054	3.47***	0.043	2.05**
Largest stake in the company						
Directors	0.119	1.57	-0.241	-3.75***	-0.028	-0.86
Financial companies	0.271	3.86***	-0.174	-3.36***	-0.070	-2.46**
Families or individuals	0.032	0.47	-0.016	-0.10	-0.008	-0.08
Ind./Com. Companies	0.214	2.94***	-0.276	-3.40***	-0.131	-1.95*
Government	0.494	4.96***	-0.220	-1.82*	-0.161	-2.64***
Accounting data						
Firm size (ln market cap)	-0.003	-0.44	-0.009	-1.37	0.009	2.41**
ROE	-0.001	-1.00	0.001	2.16**	-0.002	-5.53***
Leverage	-0.098	-2.06**	0.124	3.54***	0.000	0.61
Exercise characteristics						
Exercise at vesting					0.033	2.46**
Exercise at expiration					0.047	2.86***
Full sale of acquired shares					-0.023	-0.8
Mean of dependent variable	0.098		-0.066		-0.081	
Std of dependent variable	0.365		0.363		0.200	
Number of observations	651		724		869	
Adjusted R^2	11.86%		11.03%		6.72%	

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