

## Signaling Power of Open Market Share Repurchases in Germany

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### Abstract

This paper shows that abnormal stock price returns around open market repurchase announcements are about four times higher in Germany than in the US (12% versus 3%). We hypothesize that this observation can be explained by country differences in repurchase regulation. Our empirical evidence indicates that German managers primarily buy back shares to signal an undervaluation of their firm. We demonstrate that the stringent repurchase process prescribed by German law attributes a higher credibility to such a signal than lax US regulations and thereby corroborate our hypothesis.

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## **Introduction**

In May 1998 the “Corporation Control and Transparency Act” (KonTraG) abolished major restrictions for German corporations to repurchase their own shares. In the five years until April 2003 more than 180 German firms used the new freedom through some 240 share repurchase announcements.

The new German laws on share repurchase programs differ in important respects from the laws and regulations that govern share repurchase transactions in the US. For example, managers of German firms must first obtain approval for a specified share repurchase program on their annual shareholder meeting and must then publicly announce any imminent share repurchase. On the shareholder meeting that follows a share repurchase, management must report the reason for the transaction, its volume and the price paid per share. In contrast, US firms need only obtain an approval from their company board and are only required to publicly announce the establishment of a repurchase program. US firms do not need to disclose the details of any actual repurchase transactions to authorities or to shareholders. The extant empirical literature on US open market share repurchases that is cited below provides strong evidence that many US firms announce repurchase programs to convey their assessment to investors that their shares are undervalued. A change in disclosure requirements might affect the quality of such a signal and might hence affect the motivation of firms to engage in share repurchases. An empirical analysis of share repurchases in Germany therefore promises to provide new insights on the role of specific legal provisions in instigating corporate insiders to successfully disseminate private information to capital markets.

This paper proceeds from this general conjecture and pursues two goals. In order to find out whether German share repurchase announcements have a different market impact than repurchase announcements in other countries, we measure the abnormal share price effects around the two major publicly observable events in the context of share repurchases in Germany, namely a firm’s initial voluntary statement to seek shareholder approval and the subsequent obligatory announcement to start repurchasing shares. We then test four popular hypotheses on why managers repurchase shares and thereby investigate whether motivations of German firms differ systematically from the motivations of US firms. Our main empirical result is that although both, German and US firms seem to primarily repurchase shares to signal that their firm is undervalued, average announcement effects are dramatically higher in German than in the US. We discuss three possible explanations for this observation and conclude that

German repurchase regulations are stricter than US regulations and therefore provide for higher signal strength.

The paper unfolds as follows: The next section describes the German legal framework governing repurchase programs and compares this framework to US regulations. Section 3 briefly reviews the empirical literature on repurchase transactions in various countries. Section 4 presents the dataset and section 5 describes the methodology. Section 6 reports and discusses the empirical results. The last section summarizes the paper and concludes with a side note to regulators. Throughout the paper we concentrate on open market programs because they have been by far the most popular vehicle in Germany.

## **1. Repurchase motivations**

Potential motivations of managers to repurchase shares have been extensively discussed in the literature<sup>1</sup>. In what follows we only provide a brief overview. For this purpose we group the most widely discussed motivations into two categories. The five motivations from the first category are generally considered to be in line with shareholders' interests. The second category contains three motivations that tend to contravene shareholders' interests.

Motivations broadly in line with shareholders' interests include the attempt by management to signal to investors that the true value of their corporation's equity exceeds its current market value. Such a signal might be based on management's assessment that the true mean of the probability distribution of the firm's future cash flows is actually higher than perceived by the market or alternatively, that the true variance of future returns is higher than expected, holding the distribution mean constant (DANN 1981). In the first case, all of the firm's risky securities appear to be undervalued. In the latter case, only equity claims appear to be undervalued, whereas claims in the form of risky debt might in fact be overvalued. Share repurchases might then lead to an expropriation of debtholders' wealth to the benefit of shareholders. It is typically assumed that a firm's management is better informed about the firm's true current competitive position and its future value creation prospects than outside investors. However, a straight public announcement by the management that it considers its firm's shares to be undervalued generally lacks credibility. Because outside investors cannot distinguish between true and

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<sup>1</sup> See for example COMMENT/JARRELL (1991), STEPHENS/WEISBACH (1998) and GRULLON/IKENBERRY (2000).

deliberately misleading announcements they will perceive of all undervaluation announcements as cheap talk unless the cost of producing false announcements is sufficiently high. Share repurchase announcements cause two types of costs to overvalued firms. Firstly, firms that repurchase overvalued shares must reckon that the share price will soon decline to its true intrinsic value so that they incur a loss from such a transaction. Secondly, firms that announce to repurchase shares but then decide not to do so might see their general reputation for honest capital market communication deteriorate. Depending on the legal and regulatory ramifications for share repurchase programs, such firms also risk that authorities initiate investigations of price manipulation. Given these potential costs, share repurchase announcements can serve as a device to enhance the credibility of an undervaluation signal. Such credible signals should then lead to an appreciation in stock price.

Also in line with shareholders' interests are share repurchases through which a firm aims to distribute excess cash to its shareholders. Excess cash gives rise to agency conflicts as self-interested managers might use these funds for negative net present value investments like fringe benefit consumption or empire building and thereby harm the owners of the firm (JENSEN 1986). Agency problems might also arise in situations where a firm's management does not engage in outright value destruction but merely runs out of value-adding investment opportunities and keeps excess cash on its balance sheet. Shareholders are not able to reallocate their capital to more productive uses in the economy. Both types of agency problems are ameliorated if excess cash is used to repurchase the firm's own shares. As a consequence, share price effects of such share repurchases should be *ceteris paribus* stronger for firms where manager and shareholder interests are less aligned. Alignment is typically attained through incentive-based manager compensation contracts or through concentration of control rights in the hands of large blockholders, who have stronger incentives to monitor and discipline management than dispersed owners (SHLEIFER/VISHNY 1986). If effective corporate governance structures are in place, excess cash distributions in the form of share repurchases should therefore not come at a big surprise to investors and share prices should not react strongly as a consequence.

A third motivation concerns the optimization of a firm's capital structure. However, in many countries such as Germany, France, Italy and Hong Kong, the volume of shares to be repurchased must not exceed 10% of total shares outstanding. Firms from such countries can therefore not use repurchase programs to increase their debt-to-capital ratio dramatically and to transfer value from debt holders to shareholders. As GRULLON/IKENBERRY (2000) point out,

firms might nevertheless use repurchase programs to fine-tune their capital structure in response to potential dilution effects from their employee and executive stock options incentive plans. If the subsequent change in the capital structure is only marginal and if – as typically is the case – the announcement does not provide new information on the ramifications of the compensation plan, price effects should be quite moderate.

In countries where the tax burden on investor's income is typically higher for dividend income than for capital gains, shareholder-oriented managers have a fourth motivation to repurchase shares. Given a tax-induced preference of most of their firm's shareholders for capital gains over dividend income, such managers should substitute dividend payouts by share repurchases. Because tax differentials are publicly known and because dividend payouts and share repurchases are otherwise largely economically equivalent, dividend substitution per se should not have a material effect on share prices (BLACK/SCHOLES 1974).

The last motivation from this category is also tax-induced and applies to firms that plan to acquire another firm. In many jurisdictions, an exchange of shares is more tax-efficient for the target firm than the receipt of cash. The acquirer firm can therefore repurchase own shares to obtain a tax-efficient currency for M&A transactions. Tax advantages for the target might then translate into a lower acquisition price and thereby benefit the shareholders of the acquiring firm. If the characteristics of the acquisition deal are known ex ante, the repurchase announcement will however not convey new information to the market and should leave the acquirer's market value unchanged.

Motivations that tend to contravene shareholders' interest include management's efforts to fend off a value-creating takeover attempt. If the target management must fear that it will be ousted as a consequence of such a transaction and that it will not be compensated for any losses in future income and private benefits it might use share repurchases to reduce the amount of outstanding shares that the raider may purchase from dispersed outside shareholders and to deplete any cash reserves of the target firm that the raider may want to obtain through the acquisition. BAGWELL (1991) provides a more subtle argument why share repurchases can deter a takeover. She argues that shareholders that tender in a repurchase tend to have lower valuations for the firm than the average shareholder. This heterogeneity in valuations might leave the raider with a more "expensive" pool of shareholders after the repurchase, possibly deterring him to make a takeover offer. Given the above mentioned restrictions on the volume of shares to be repurchased in Germany, chances to fend-off a takeover by means of solely

repurchasing shares are probably quite low. However, the share repurchase may be just one of several defensive measures taken by incumbent target management and as such might indeed contribute to shareholder value destruction.

A second situation in which share repurchases can violate the interests of at least one group of shareholders arises when only inside shareholders get to know the exact timing of repurchase transactions. They might use that knowledge to dispose of their shares at a higher price than under normal market conditions (IKENBERRY/VERMAELEN 1996). This would cause a wealth transfer from outside shareholders to inside shareholders and if anticipated by outside shareholders should lead to a negative announcement effect.

Finally, managers who hold a substantial equity stake in their firm might launch a repurchase program in an attempt to dilute the control rights of other shareholder groups. Even if these other shareholders are not willing to sell their shares to the firm the transaction costs associated with such an attempt might have a negative value impact.

If the market believes that a firm is driven by one or several motivations from the first (second) category and if there still remains some uncertainty on whether the firm will actually repurchase shares, one should observe positive (negative) price effects on the very date when managers credibly announce to repurchase shares. On the contrary, if the market has no prior belief regarding the motivations of a given firm, its share price should not react at all in response to an announcement. In such a scenario, investors expect that the firm in question will be buying back shares solely to shrink its asset base and as a consequence, that total earnings will decline by the same percentage value as the number of shares outstanding.<sup>2</sup> Earnings per share (EPS) will therefore remain unchanged. As a consequence, firms that solely buy back shares to increase their EPS ratio should not be able to achieve this goal if the market is aware of that attempt. The “EPS bump”-story which is often advocated by investment banks and the firms themselves can hence be simply ruled out by pure logic.

In this paper we content ourselves with testing four out of the eight hypotheses regarding potential motivations of German firms to repurchase shares: the “undervaluation signal”-, the “excess cash”-, the “takeover defense” - and the “tax efficiency”-hypothesis. As will be shown

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<sup>2</sup> More specifically, investors will assume that the funds that are used to repurchase shares could have been used as productively within the firm as all other assets of the firm. In contrast, if distributed funds had yielded a below-average return within the firm such funds would have been considered excess funds and as a consequence, investors would have had reason to believe that the firm is repurchase shares to reduce agency cost.

in the next section the “rent seeking by insiders”-motivation is largely ruled out by German law so that the associated hypothesis can be falsified straight away. There are two reasons why we refrain from testing the remaining three hypotheses in this paper. The first is a methodological reason. Our empirical approach is based on regressing abnormal returns from share buyback announcements on firm characteristics. As we have argued above, buyback announcements that are driven either by the “capital structure optimization”-, the “acquisition currency”- or the “control dilution”- motivation would most likely result in very small share price reactions. We have therefore reason to believe that even covariates that ideally captured any of these three motivations would carry statistically insignificant coefficients in our regression model. The second reason concerns data availability. It would be extremely difficult to obtain accurate information on relevant firm characteristics.

## **2. Share repurchase regulation in Germany and in the US**

The German Corporation Control and Transparency Act (KonTraG) became effective on May 1, 1998 and permitted German firms to repurchase common and preferred shares under the following conditions and subject to the following requirements. A share repurchase program has to be first authorized by the annual general meeting of shareholders (AGM). The AGM has to decide on the maximum amount of shares to be repurchased during the program. The amount must not exceed ten percent of total shares outstanding<sup>3</sup> and the repurchase has to be made out of distributable profits. The AGM also determines the length of the period during which transactions can take place. This period cannot be longer than 18 months. Moreover, shareholders must decide on the precise buyback method unless the firm plans to repurchase shares through the open market.<sup>4</sup> AGM approval has to be reported to Germany’s financial services authority (BaFin) immediately. Before a firm can repurchase shares on the open market it has to make a public announcement. This announcement does not have to state the volume of shares to be repurchased and it is not binding for the firm, i.e. the firm can choose not to

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<sup>3</sup> A five-percent threshold applies to financial institutions trading in their own purposes (section 71 (1) Nr. 7 AktG). The law does not specify whether the thresholds apply to the total stock of repurchased shares held in treasury or solely to one 18-month period. In the latter case, firms could in principle buy back a substantially higher portion of own shares by obtaining AGM approval in subsequent years. For a discussion of this ambiguity see KRAFT/ALTVATER (1998) and BOSSE (2000).

<sup>4</sup> Existing types of non-open-market buy-backs include fixed-price tender offers, where the corporation offers to buy a specified amount of shares at a fixed price - typically exceeding current market prices - during a pre-specified period; Dutch-auction tender-offers, which are similar to fixed-price tender offers, except that prices are set in a book-building procedure and targeted buy-backs, where the corporation negotiates with a particular shareholder over the purchase of a block of shares.

transact. If it repurchases shares, transactions have to be conducted in a way such that all the firm's shareholders are treated exactly the same. Moreover, transactions must not be used for the purpose of trading. On the AGM following a transaction the firm has to report why it bought back shares, how many shares it bought back and at which price it bought back the shares.

In their totality these legal provisions strongly mitigate the motivations that we discussed in the introduction as not being commensurate with the interests of (outside) shareholders. Firstly, the requirement of equal treatment of all shareholders in combination with the obligation to obtain an explicit AGM authorization for tender offers or targeted buy-backs strongly impedes wealth transfers from one shareholder group to another. As a matter of fact, a mere four out of the 237 buyback announcements in our initial sample were not open market programs. Secondly, because the amount of equity to be repurchased is capped at 10% of total nominal capital, chances to substantially change a firm's capital structure or to deter a takeover are fairly limited.<sup>5</sup> Moreover, the fact that repurchased shares held in treasury are not entitled to voting rights impedes control right dilution.

German legal ramifications might also impose prohibitively high costs on firms that make a misleading repurchase announcement. Firstly, the costs of establishing a repurchase program are not trivial because AGM approval is required. Secondly, firms that publicly announce an imminent repurchase transaction but then actually do not repurchase any or only a miniscule amount of shares must fear that regulators suspect price manipulation and initiate investigations. Shareholders of these firms will most likely also make inquiries, possibly calling into question the managers' reputation for truthful disclosures. Repurchasing and immediately reselling shares is neither a viable option for this type of firms because such behavior would certainly be viewed as trading in own shares, which is explicitly prohibited by law. Generally, higher expected costs of misleading repurchase announcements will reduce the occurrence of such announcements. In turn, such higher costs will increase the strength of the signal that honest managers can communicate to the market by means of a repurchase announcement. Arguably then, the strictness of German repurchase regulation permits for fairly strong signals.

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<sup>5</sup> In fact, GERKE ET AL. (2003) report that German firms have on average only bought back 3.2% of their outstanding shares. This figure is actually not too far away from the corresponding US figure. GRULLON/MICHAELY (2004) report that the median US firm sought to repurchase 5% of its outstanding shares and STEPHENS/WEISBACH (1998) find that US firms completed roughly 75% of their authorized shares during a three-year period after the announcement.



US regulations on open market share repurchase differ along some important lines from German laws.<sup>6</sup> In the US, share repurchase programs do not require approval by the AGM but only by the board of directors. There is neither a restriction on the duration of the program nor on the number of shares to be repurchased. STEPHENS/WEISBACH (1998) report that it is indeed not uncommon that US open market programs spread out over several years. Apart from making an initial public announcement, firms are not obliged to formally disclose any details of their repurchase programs and their individual repurchase transactions. As a consequence, both, the costs for establishing a repurchase program and the penalties for not buying shares after an announcement are lower in the US than in Germany. At the same time, US firms have more flexibility in terms of transaction volume and transaction timing. That might open up more opportunities for corporate insiders to extract some rents from corporate outsiders.

Two broad empirical implications follow from these discrepancies between German and US legal ramifications. We would expect a smaller portion of negative abnormal announcement returns in Germany than in the US and, if both German and US firms are mainly motivated by signaling undervaluation, we would also expect that positive returns are on average higher in Germany than in the US.

### **3. Related empirical literature**

The empirical literature on stock buy-backs has so far largely focused on US markets. A number of clear-cut results have emerged. Share repurchases lead to significant positive abnormal returns on average, but stock price reactions to tender offers are on average at least twice as large than stock price reactions to open market transactions. MASULIS (1980), DANN (1981), VERMAELEN (1981) and COMMENT/JARRELL (1991) found that abnormal returns from fixed price tender offers well in excess of 10% and that the average premium of tender over market price is more than 20%. According to Comment/Jarrell (1991) Dutch auction tender offers lead on average to an abnormal return of 8% during the three days around the announcement. In contrast, open market transaction by US corporations were found by virtually all studies to result in much smaller abnormal returns of around 3% (see Table 1).

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<sup>6</sup> For an international overview on the open market share repurchase regulations see KIM/SCHREMPER/VARAIYA (2004). The regulations in other European Union countries are fairly similar to the regulations in Germany.

The studies cited so far all provide strong evidence for the validity of the undervaluation signal hypothesis. IKENBERRY ET AL (1995) observe a strong negative relationship between the market-to-book ratio before the buy-back announcement and the magnitude of positive abnormal returns thereafter. Abnormal returns were also found to be larger for firms whose stocks underperformed the market during the days before announcement (STEPHENS/WEISBACH 1998, COMMENT/JARRELL 1991 and IKENBERRY ET AL 1995). Both results reconcile neatly with the view that signaling effects are stronger the higher the potential for an actual undervaluation. VERMAELEN (1981) shows evidence that the strength of the signal is also a function of its credibility. He discovers that abnormal returns increase in the amount of shares held by management as well as in the announced portion of outstanding equity to be repurchased (see also COMMENT/JARRELL 1991 and IKENBERRY ET AL. 1995). The idea is that signal credibility increases in the manager wealth at risk. Finally, the extent of information asymmetries between management and investors also seems to have a bearing on announcement effects. IKENBERRY ET AL. (1995) document that price effects are inversely related to firm size. Given that smaller firms disclose less information to capital markets and are less researched by equity analysts, information asymmetries should decrease with firm size. Taken together, buybacks seem to serve as a credible signaling device for managers who seek to convey to investors that the market capitalization of their firm is lower than its true value.<sup>7</sup>

Among others, SHOVEN/SIMON (1987), BAGWELL/SHOVEN (1988), EVANS ET AL (2000) and LI/MCNALLY (1999) have explicitly tested the validity of the free cash flow hypothesis. They find a positive correlation between abnormal returns and measures for excess funds at the discretion of management. They conclude that buy-backs can be an effective means of convincing the market that management refrains from shirking and other negative-NPV investments. Moreover, STEPHENS/WEISBACH (1998) observe that firms with more excess cash ceteris paribus tend to buy back a larger volume of shares, indicating that repurchases are indeed used by some firms to reduce excess cash.

BAGWELL/SHOVEN (1989) provide some evidence that is inconsistent with the tax efficiency-hypothesis. Cash distributions through repurchases have not declined in the US right after the 1986 Tax Reform Act although the act abolished the tax advantage of repurchases over

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<sup>7</sup> Further studies that underscore this insight include NETTER/MITCHELL (1989) and BARTOV (1991). WANSLEY ET AL (1989) directly assess buy-back motivations by means of questionnaires and found that perceived undervaluation was indeed one of the most frequently quoted motivations.

dividends. LIE/LIE (1999) qualify this result by showing that a large number of US firms did indeed prefer regular dividend increases over open market repurchases in the late eighties.

A few studies have measured market reactions to US repurchase announcements that might be motivated at least to some extent by a firm’s objective to deter a takeover attempt. DANN/DEANGELO (1988), DAVIDSON/GARRISON (1989) and DENIS (1990) observe negative abnormal stock price returns and thereby corroborate the hypothesis that this type of buy-back transaction violates shareholders’ interests.

In summary and not surprisingly, there is no single overriding motivation for US firms to repurchase shares. However, “undervaluation signaling” seems to be the most prominent motivation.

Table 1: Prior empirical results on abnormal returns from announcing open-market repurchase programs (OMR)

Country	Study	Abnormal Returns	Dataset
<b>US</b>	McNally (1999)	CAR [-1;+1]: 2.5%	702 OMR (1984-1988)
	Grullon/Michalek (2004)	CAR [-1;+1]: 2.7%	4,443 OMR (1980-1997)
	Vermaelen (1981)	CAR [-1;+1]: 3.7%	243 OMR (1970-1978)
	Stephens/Weisbach (1998)	CAR [-1;+2]: 2.7%	591 OMR (1981-1990)
	Ikenberry et al. (1995)	CAR [-2;+2]: 3.5%	1,239 OMR (1980-1990)
	Comment/Jarrell (1991)	CAR [-1;+1]: 2.3%	1,197 OMR (1984-1988)
<b>Australia</b>	Lamba/Ramsay (2000)	CAR [-1;+1]: 3.3%	103 OMR (1989-1998)
<b>Canada</b>	Li/McNally (1999)	CAR [-2;+2]: 3.6%	183 OMR (1989-1992)
	Ikenberry et al. (2000)	CAR [-15;+15]: 0.9%	1,060 OMR (1989-1997)
<b>Germany</b>	Schremper (2002)	CAR [-1;+1]: 4.1%	112 (mostly) OMR (1998-2000)
	Gerke et al. (2003)	CAR [-1;+1]: 6.1%	120 OMR (1998-2000)
	Seifert/Stehle (2003)	CAR [-1;+1]: 5.9%	192 OMR (1998-2003)
<b>Japan</b>	Zhang (2002)	CAR [-1;+2]: 6.0%	39 OMR (1995-1999)
<b>Korea</b>	Jung/Lee (2003)	CAR [0;+5]: 2.8%	382 OMR (1994-1998)
<b>Switzerland</b>	Dumont et al. (2004)	CAR [-2;+2]: 1.8%	10 OMR (1999-2003)
<b>UK</b>	Rau/Vermaelen (2002)	CAR [-2;+2]: 1.1%	126 OMR (1985-1998)
	Oswald/Young (2002)	CAR [-1;+1]: 1.4%	266 (mostly) OMR (1995-2000)
	Rees (1996)	CAR [-2;+2]: 0.3%	882 OMR (1981-1990)

Empirical results for other countries are broadly in line with those for the US. Cumulative returns around the announcement day are on average strictly positive (see Table 1) and evidence

on the motivation to repurchase shares is mostly consistent with the undervaluation signaling hypothesis. The UK, however, marks an exception. RAU/VERMAELEN (2002) argue that legal restrictions severely constrain UK firms in using repurchase announcements as an undervaluation signaling device. For example, UK firms are not permitted to repurchase shares in the two-month period preceding earnings or when directors possess price-sensitive but unpublished information about the firm. The authors propose that repurchases are largely motivated in the UK by tax consequences for institutional shareholders such as pension funds.

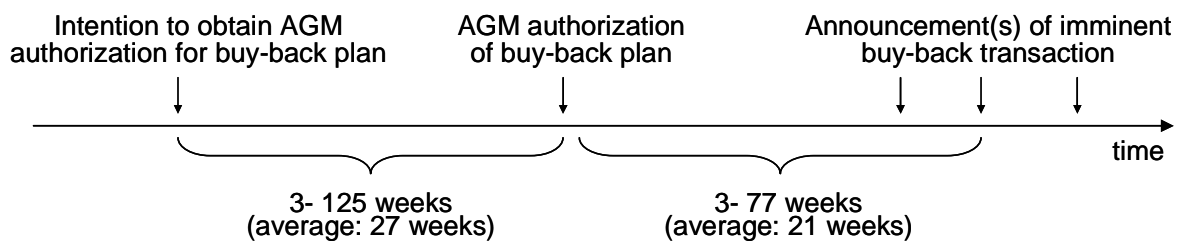
We are aware of three related empirical studies for Germany. SCHREMPER (2002) analyses 112 buyback announcements from the period between May 1998 and December 2000 and finds significant abnormal returns of around 2.6%. The sample of GERKE ET AL. (2003) comprises of 120 buyback announcements from May 1998 to December 2002 that are not contaminated by coincident other news events. The authors find average abnormal returns on the announcement day of 6.1%. They subdivide their sample to measure differences in abnormal returns between a) firms that either belong to the DAX 100 index (+2.7%), the Nemax index (+9.0%) or the small cap index (+4.8%), b) firms that either stated undervaluation (+8.9%) or the exchange of cash into a superior acquisition currency (+5.2%) as their main repurchasing motivation, and c) announcements that occurred during the general upturn of German equity markets between May 1998 and February 2000 (+3.7%) and announcements that occurred during the subsequent bear market (+7.1%). SEIFERT/STEHLE (2003) largely confirm the results of GERKE ET AL. (2003) but rebut their findings on the effect of bull and bear markets on price effects. We extend the existing empirical literature on German repurchase announcements by using a larger sample size, by investigating price effects around the initial disclosure to seek AGM approval for a buyback plan and by conducting multivariate regression analyses on a richer set of independent variables.

#### **4. Data**

Data on AGM approvals of share repurchase plans can be downloaded from the website of Germany's financial services authority BaFin ([www.bafin.de](http://www.bafin.de)). The BaFin reports the names and addresses of the firms and the day on which they obtained AGM approval. From May 1998 until April 11, 2003, 483 corporations sought AGM approval for a total of 785 buy-back plans. Roughly 70% of the approvals were granted in the three months from May to July, when most AGMs take place in Germany. Needless to say, it would not make sense to measure abnormal

returns for the day when a repurchase program was approved by an AGM. The approval is only one among many AGM decisions that might have an impact on share prices. More importantly, the information that a given firm is planning to establish a repurchase program had been dissipated to capital markets well in advance of the AGM and given that programs are typically approved by shareholders, AGM authorization itself does not constitute a material event. We therefore conducted a key-word search on several news databases such as Reuters, Bloomberg and Factiva to find reports on initial statements by German firms that they consider to establish a repurchase program in the near future. This search strategy yielded 321 such statements. We matched initial statements with AGM approvals to measure the time that typically elapsed between these two events. As shown in Figure 1 below, AGM approval occurred on average 21 weeks after the initial statement.

Figure 1: Time line of share repurchase programs in Germany

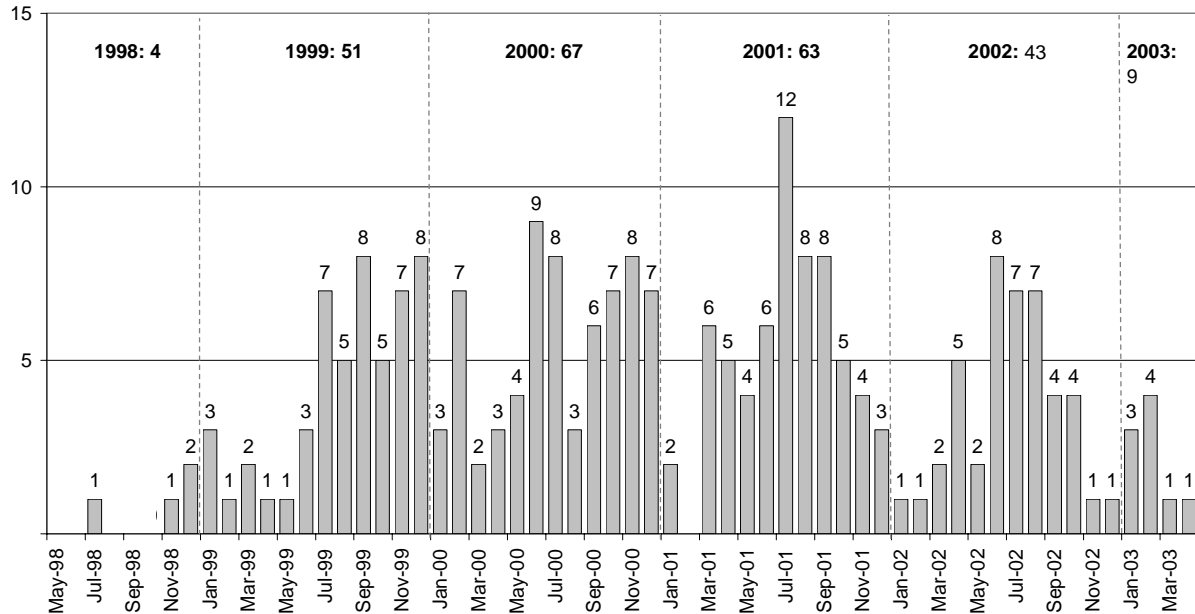


Finally, we searched the ad-hoc announcements database of Deutsche Börse AG and the news databases mentioned above to find announcements by firms with authorized repurchase programs that they intend to buy back shares. For our observation period from May 1, 1998 to April 11, 2003 we identified 237 common share buyback announcements by 181 different German firms. Figure 2 shows the number of announcements per month. Repurchase announcements were made on average 21 weeks after the AGM took place (see Figure 1 above). Taking into account that 761 AGM approvals occurred in the period from May 1, 1998 to Nov. 15, 2002 (22 weeks prior to the end of our observation period), this implies that about three out of ten AGM approvals were indeed followed by a repurchase announcement.

For the purpose of our event study we dropped all initial statements for which we were not able to pinpoint the exact day of the very first news release (e.g. because the statement was part of the invitation letter to the AGM) or for which we identified coincident confounding news (e.g. because the statement was buried in a more comprehensive disclosure of material information). This filtering technique significantly reduced the number of initial statement observations down

to 111. From the 237 observations on repurchase announcements we dropped four because they concerned tender offers.<sup>8</sup> We excluded another nine observations due to coincident confounding events such as a board change or an earnings disclosure. 224 repurchase announcement observations therefore remained in the sample.

Figure 2: Share repurchase announcements in Germany (N=237)



For the sake of brevity and for the sake of comparability with US studies we decided to conduct a regression analysis only for the abnormal returns from repurchase announcements and not for abnormal returns from initial statements. In what follows we define the variables that we used as covariates. Table 2 below shows the corresponding descriptive statistics.

- **MTB:** The Market-to-Book ratio is defined as the market value of equity two days before the announcement date divided by the book value of equity as reported in the most recent financial statement prior to the repurchase announcement. The higher the market-to-book ratio of a firm the higher are investors' expectations with regards to the firm creating economic value in the future. Firms with high market-to-book ratios are therefore often referred to as "growth" firms. Expectations are more modest for so called "value" firms with low market-to-book ratios. Like is done in most other related studies we argue that for

<sup>8</sup> These are AGIV (4-Apr-00, fixed-price tender offer to common shareholders), Friedrich Grohe (7-Oct-99, fixed-price tender offer to minority holders of preferred stock), Kögel Fahrzeuge (7-Dec-98, fixed-price tender to common shareholders) and Kronos AG (18-Jan-99, Dutch-auction tender offer to common shareholders).

value firms perceived undervaluation is a more likely factor in the decision to repurchase than for growth firms. A negative relation between abnormal returns and MTB would then be consistent with the “undervaluation signaling” hypothesis. The prevalence of long-term mean reversion in stock returns, which was recently documented for Germany by MOERSCHEN/SCHIERECK (2003) might reinforce this relationship.

Table 2: Descriptive statistics (N=224)

	Dependent variables			Independent variables				Independent dummy variables				
	AR[0]	CAR [-1;+1]	CAR [-1;+10]	MTB	SIZE	PAST RETURN	CASH	Averages				
Max.	40.6%	36.8%	56.5%	14.80	11.55	49.6%	125.3%					
Min.	-13.6%	-18.5%	-36.6%	0.18	1.76	-71.8%	1.3%	NMLISTING	0.43	TARGET	0.08	
Avg.	4.9%	6.0%	7.0%	2.55	5.49	-11.1%	39.3%	UNDERVAL	0.43	CONT.25	0.33	
Median	3.1%	4.6%	5.0%	1.71	5.06	-7.6%	32.1%	SERVICE	0.29	CONT.50	0.35	
Stdev.	7.8%	9.4%	14.3%	2.78	2.10	21.2%	30.4%	FINANCIAL	0.13	CONT.75	0.11	

- **SIZE:** Firm size is expressed as the logarithm of the firm’s enterprise value in million Euros. Enterprise value is defined as the sum of the market value of equity and the book value of interest bearing debt. Size is treated as a proxy for the extent of information asymmetries between a firm and capital markets. The larger a firm, we argue, the more stringent are disclosure requirements and the more analysts cover the firm, and as a consequence thereof, the more firm-specific information is publicly available. Managers from small firms then have more potential in signaling private information by means of repurchase announcements than managers from big firms.
- **NMLISTING:** This dummy variable is set to 1 if the firm was traded on the Neuer Markt - a by now abolished segment of the German stock exchange for young and innovative firms. Like SIZE, NMLISTING also serves as a proxy for information asymmetries between the company and its investors. Firms listed on the Neuer Markt are typically characterized by shorter track records and a higher degree of uncertainty regarding future industry prospects than more mature firms listed on

other exchange segments. As a consequence, signals should be more powerful and abnormal returns should be higher for Neuer Markt firms.

- **PASTRETURN:** This variable measures the cumulated returns<sup>9</sup> of a firm's stock over the 30 day-period prior to our event window [-31;-2]. The worse the performance, the larger is arguably the potential for undervaluation and the more might therefore the market treat buyback announcements as credible undervaluation signals. We expect a negative relation between PASTRETURN and price effects around the announcement. While not shown in this paper, we also ran regressions with PASTRETURN variables for the 45-day and the 60-day periods preceding the announcement event. It turns out that results are not affected by the choice of period length.
- **UNDERVAL:** This dummy variable is set to 1 if a firm states "undervaluation" as a main motivation for repurchasing own shares. Although German firms are not legally obliged to disclose their motivations for share buybacks ex ante, it is common practice that they provide such information voluntarily as part of the announcement. Out of the 224 firms in our final sample, 185 disclosed their motivations.<sup>10</sup> In many cases, more than one motivation was stated. Table 3 below reports the total number of declarations and the percentage of firms per type of motivation. 96 or roughly one half of the firms stated a perceived undervaluation of their stock as a primary reason to buy back shares.<sup>11</sup> Rational investors will consider such a statement cheap talk as there is no penalty attached to wrong statements. As a consequence we expect to observe no difference in announcement effects between firms stating different motivations.

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<sup>9</sup> We have used both absolute and abnormal returns in our regressions. The coefficients and their statistical significance levels are virtually the same for the two alternative specifications.

<sup>10</sup> UNDERVAL was set to zero for the 39 firms that did not specify their motivations.

<sup>11</sup> In the Canadian sample of LI/MCNALLY (1999), more than two thirds of the 183 firms stated undervaluation as their main motivation.



Table 3: Motivations to repurchase shares as declared by management (N=185)

	Number of declarations	Percent of 185 sample firms
Acquisition currency	107	58%
Undervaluation	96	52%
Employee participation programs	32	17%
Cancellations/pay-outs to shareholders	27	15%
Other	5	3%
Sum	267	

- **CASH:** This variable is defined as the amount of liquid assets over the book value of equity. It is used as proxy for the amount of free cash that is at the disposal of managers. If the cash position is large and if the firm does not possess enough profitable investment opportunities, investors will welcome share repurchases as a means to avoid negative-NPV projects in general and private benefit consumption by managers in particular.
- **CONTROL25, CONTROL50 and CONTROL75:** These dummy variables are set to 1 if the aggregate holdings of the two largest shareholders exceed certain threshold values. Control25 is 1 for holdings greater or equal to 25% and below 50% of total shares outstanding. CONTROL50 is 1 if holdings are greater or equal to 50% and smaller than 75%. CONTROL75 is 1 if holdings are 75% or greater. We attempt to measure any price effects that might arise from a firm's specific governance structure. If a firm is controlled by only a few large blockholders, minority outside shareholder may have to fear that inside blockholders exercise their power in their own interest, e.g. by inducing the firm's management (which might actually be identical with or at least closely related to blockholders in the case of manager- and family-controlled firms) to transact with them at favorable terms or to invest in projects that one-sidedly benefits them.<sup>12</sup> If the extraction of private benefits by inside shareholders is indeed prevalent, one should expect greater positive price effects for firms with highly concentrated ownership. In these cases, a

<sup>12</sup> EHRHARDT/NOWAK (2002) show in their empirical analysis that private benefits for family blockholders can indeed be very large in German firms and that stocks of firms, where founding families own more than 75% underperformed their peers significantly over a three-year period. NENOVA (2003) finds that the value of corporate voting rights, which can be interpreted as a lower bound for actual private benefits of the controlling shareholders was more than twice as high in Germany than in the US in 1997.

buyback implies an unexpected payout of cash that outsiders might interpret as a signal for closer alignment of insiders and outsider interests.

- **TARGET:** We introduce this dummy variable to test whether investors' perceptions that a buy-back transaction might primarily be used to fend off a takeover lead to lower abnormal returns. Since we cannot observe investors' perceptions directly, we searched for constellations where share repurchases bore the potential of reducing the free-float down to a level that would have made it difficult for raiders to accumulate a controlling stake over the open market and where managers and family owners, respectively, had a substantial but non-controlling equity stake in the firm. In these constellations, management and owner families may fear that outside raiders take over control of the firm and subsequently curb any existing opportunities for incumbents to extract private benefits from the firm. We set TARGET to 1 if the free float was smaller than 25% and if the combined stake of managers and family owners was between 25% and 50% shortly before the announcement date.<sup>13</sup>
- **FINANCIAL and SERVICE:** We introduced two industry dummies to control for industry effects. FINANCIAL is 1 if a firm belongs to the financial services sector and SERVICE is 1 if a firm belongs to all other service industries, respectively. For firms from the manufacturing industry both dummies are set to zero. In an extended model, we have also controlled for time effects by including dummies for the years 1999 to 2003. Because no trend emerged and because the results for the other variables remained unchanged we omit the results for such an extended model in this paper.

If the "undervaluation signal" hypothesis holds, the coefficients for MTB, SIZE, PASTRETURN should all carry negative signs and NMLISTING should carry a positive sign. If managers aim to reduce agency problems by liberating excess cash, the coefficient for CASH should carry a positive sign. Positive coefficients for CONTROL50 and CONTROL50 would provide additional evidence for a reduction of conflicts of interests between corporate insiders and outsiders. Finally, a positive and statistically significant coefficient of TARGET would be consistent with the "takeover deterrence" hypothesis.

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<sup>13</sup> Because managers affiliated with the owner family might carry a different surname, we were not able to distinguish between managing families and pure owner families. Another weakness of the TARGET dummy is that the filtering rule implicitly assumes that a raider can only buy shares from minority shareholders but not from other non-family and non-manager blockholders. However, because TARGET is equal to 1 only for 8% of the observations, the subset of falsely categorized observations is arguably quite small.

## 5. Methodology

We conduct a standard market-model event study to measure price effects from buyback announcements. Price effects correspond to abnormal returns, or equivalently, excess returns on a firm's stock on the announcement day [0] or over a short time window surrounding that date (e.g. days [-1;+1]), respectively. Expected "normal" daily returns  $R_{it}^*$  are derived from a CAPM market model. We use daily share price returns during the time window [-270;-60] and the ordinary least square (OLS) model in (1) to estimate the parameters for the market model.

$$(1) \quad R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \text{for } t = -270, -269, \dots, -60 \quad \text{with } E(\varepsilon_{it})=0 \text{ and } \text{Var}(\varepsilon_{it})=\sigma^2(\varepsilon_{it})$$

Share price data are taken from Datastream and daily returns for day  $t$  are computed by subtracting the natural logarithm of the share price at the end of day  $t-1$  from the natural logarithm of the share price at the end of day  $t$ . Market returns are based on the broadly defined Composite DAX (CDAX) index.

Estimators of (1) and daily market returns are plugged into (2) to obtain expected returns  $R_{it}^*$  for the shares of firm  $i$ .

$$(2) \quad R_{it}^* = a_i + b_i * R_{mt} \quad \text{for } t = -30, -29, \dots, +29, +30$$

Abnormal returns for day  $t$  are defined as the difference between the observed return and the expected return for that day (see (3)).

$$(3) \quad AR_{it} = R_{it} - R_{it}^* \quad \text{for } t = -30, -29, \dots, +29, +30$$

The t-statistics from equations (4) and (5) are used to test the null hypothesis that abnormal returns on a particular day and cumulative abnormal returns for a given period  $[t; t+n]$ , respectively, are not different from zero.

$$(4) \quad T = AR_{it} / \sigma(AR_i) \quad \text{with } \sigma(AR_i) \text{ equal to the standard error of the estimate from (1)}$$

$$(5) \quad T = CAR_i^{t+n} / (\sqrt{n} * \sigma(AR_i)) \text{ with } CAR_i^{t+n} = \sum_{j=t}^{t+n} AR_{i,j}$$

We use pooled OLS-regression with White-corrected standard errors to test directly three hypotheses regarding the motivations of German firms to repurchase shares. As noted above,

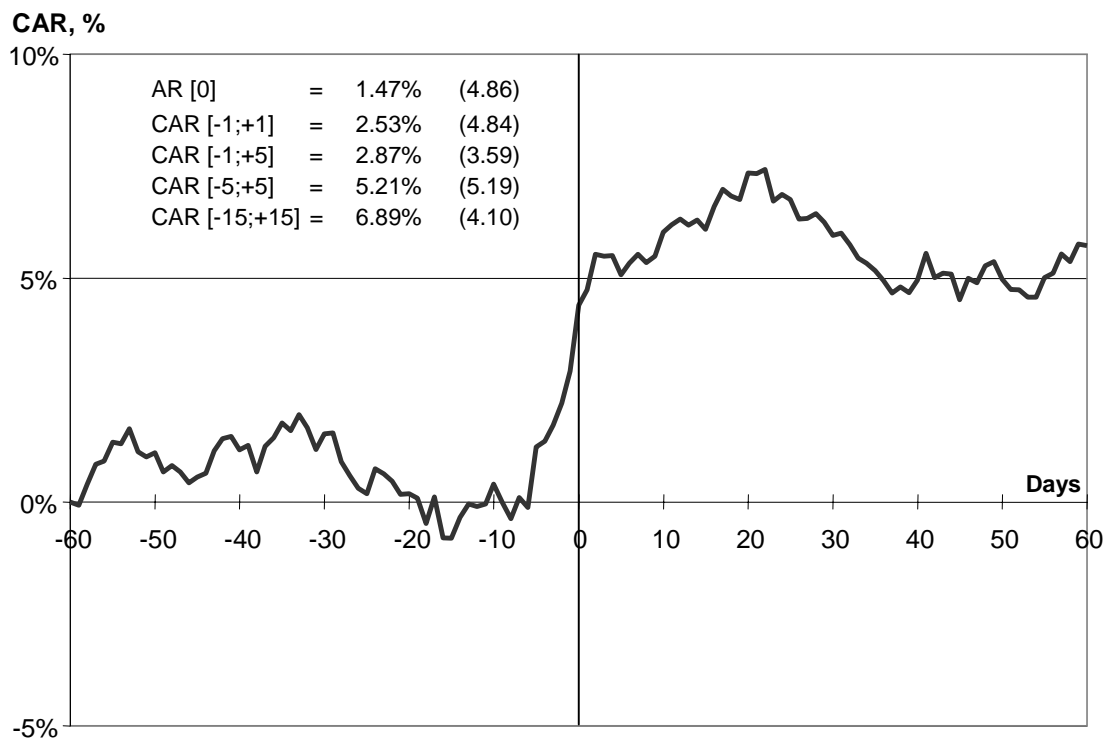
the “tax efficiency” hypothesis cannot be tested that way. However, because Germany experienced a substantial shift in its tax regime in the middle of our observation period, we are able provide indirect evidence on the validity of that fourth hypothesis.

## 6. Empirical Results

### Abnormal Returns

Figure 3 below plots average cumulative abnormal stock returns for the 121-day period surrounding the 111 initial statements by German firms that they seek AGM approval for a share repurchase plan.

Figure 3: Average cumulative abnormal returns from statements to seek AGM approval for a buyback plan (N=111)



Note: t-statistics in parentheses

Cumulative abnormal returns are virtually zero until five days before the event but are significantly positive thereafter. While the average price effect on the event day itself is only a moderate 1.5%, cumulative price effects jump up to over 5% for the 11 days surrounding the event day. There are two mutually non-exclusive explanations why positive abnormal returns

can already be observed shortly before day zero. Firstly, although we have carefully searched for the very first point in time when information on the initial statement was publicly available we may have missed some bits of public information that had been dissipated to the markets in advance. Secondly, pre announcement abnormal returns can indicate that no public information was available prior to the statement of the firm but that firm insiders traded on their private information regarding an imminent such statement.

Given that cumulative abnormal returns around the initial statement to seek AGM approval total around 5 percent, we can crudely infer the expected average magnitude of abnormal returns from a subsequent repurchase announcement. The price reaction ( $R_A = 1 + r_A$ ) around date A of the initial statement should be a positive function of the expected abnormal share price appreciation on the later repurchase announcement date B ( $R_B = 1 + r_B$ ) and the probability  $p$  that investors assign to the actual occurrence of a buyback announcement. Taking on the perspective of a risk neutral investor who, at date A, determines the maximum share price appreciation  $R_A$  at which it is no longer worthwhile to buy the stock in question, we can write:<sup>14</sup>

$$(6) \quad R_A = p * (R_A * R_B) + (1 - p) * 1 .$$

Collecting terms and solving for  $R_B$  yields

$$(7) \quad R_B = 1/p - (1 - p) / (p * R_A) .$$

From section 4 we know that the unconditional probability that AGM approval of a share repurchase plan is followed by a repurchase announcement is roughly 30%.<sup>15</sup> Plugging  $p=0.3$  and  $r_A=5\%$  into equation (7) yields an expected abnormal return of  $r_B = 11.1\%$  for the repurchase announcement.

Figure 4 below shows average cumulative abnormal returns around the 224 dates in our sample, when German announced that they plan to repurchase their own shares over the open market. Average abnormal returns on the event day are positive at 4.9%, with 83% of the sample firms showing positive abnormal returns. Abnormal returns are also positive on average over the subsequent days. Cumulative abnormal returns are roughly 6% for the event window [-1;+1]

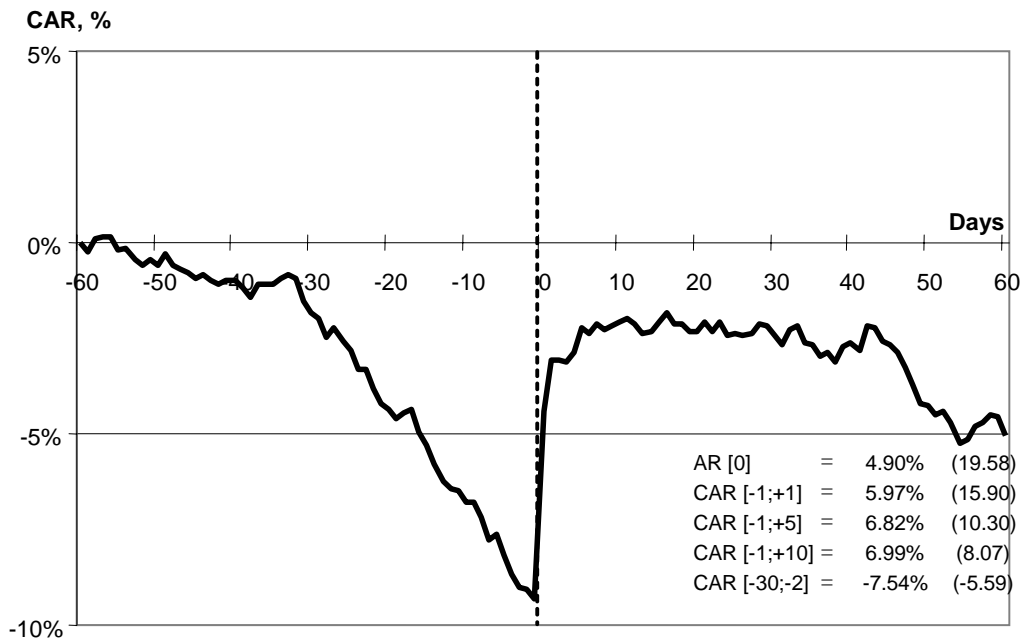
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<sup>14</sup> For the sake of simplicity we assume a discount rate equal to zero.

<sup>15</sup> This figure is an upper bound for the parameter  $p$  in equation (7) because there were a few instances where an initial statement to establish a repurchase plan did not carry over the an AGM approval, be it because the firm abandoned its repurchase plans before the AGM or be it because the AGM disapproved of the plan.

and almost 7% for the event windows [-1;+5] and [-1;+10]. All return figures are significantly different from zero at the 1%-level. Figure 4 also shows that share prices of German sample firms experienced a conspicuous abnormal downward trend over the thirty trading days before the announcement date. COMMENT/JARRELL (1991) document a very similar pattern in their analysis of some 1,200 US open market repurchase programs. Announcements are preceded in their study by negative net-of-market stock performance and positive excess price effects reverse about half of this underperformance. In Germany, abnormal returns for the thirty post announcement days reverse almost the entire 30-day pre announcement underperformance. However, if one looks at a wider event window from day -60 to day +60, in fact the very same pattern as in the US emerges.

Figure 4: Average cumulative abnormal returns from buyback announcements (N=224)



Note: t-statistics in parentheses

Can abnormal announcement returns be reconciled with expected price effects on date A as implied by abnormal returns from an initial statement to establish a repurchase plan? If one only takes into consideration average abnormal returns shortly after the repurchase announcements we are inclined to conclude that observed average returns of around 7% are broadly consistent with expected average returns of around 11%. The discrepancy might be due to measurement

errors or to a selection bias in our dataset for date A.<sup>16</sup> However, even if expected returns are broadly in line with observed short-term post announcement returns they are definitely not in line with observed abnormal returns for a wider event window around date B. Given that repurchase announcements are on average preceded by a period of relative underperformance and that short-term abnormal returns around the repurchase announcement only partly offset this underperformance, rational investors should factor in such a pattern in their average evaluation of firms' initial statements to establish a repurchase plan. In such a scenario we would expect insignificant or even negative average abnormal returns on date A. This leaves us with a puzzle for which we have only one explanation. The market assigns to all firms – irrespective of whether they establish a repurchase plan or not – a certain probability that their stock will experience at some future point in time a prolonged period of negative abnormal returns. But only those firms with an approved repurchase plan have the opportunity to respond to such a dip in their share price with a repurchase. Other firms that might actually also be undervalued lack such an instrument to signal undervaluation. On date A, rational investors will then not factor in negative abnormal pre announcement returns because the ex ante probability for such an underperformance does not depend on the existence of a repurchase plan. As a consequence, investors might perceive of the establishment of such a plan as a signal that the firm in question finds future undervaluation likely and that it endows itself with an instrument to combat information asymmetries.

Taken together we find aggregate abnormal returns for the two announcements to establish and to conduct a repurchase plan between 10% and 12% for Germany. These effects are considerably higher than those documented for other countries and in particular higher than the 3% typically found for the US market (see Table 1 above). We now turn to the analysis of the motivations of German firms to repurchase shares.

### **Regression analysis**

Table 4 below presents the results of six OLS regressions. The full model includes twelve independent variables. For the reduced model we have dropped three variables that are strongly correlated (correlation coefficients exceeding 0.25) to one or more of the other variables.

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<sup>16</sup> By coincidence we may have dropped many observations on initial statements that were accompanied by very small or negative marginal abnormal returns on data A. Because confounding events were precisely the reason why we had to drop so many observations for date A we are not able to distinguish between the two explanations.

Independent variables are abnormal returns on the announcement date and cumulative abnormal returns for the two event windows [-1;+1] and [-1;+10], respectively.

All six models show unequivocally that abnormal price effects from repurchase announcements are on average greater for firms with lower market-to-book ratios (MTB), for firm with a smaller enterprise value (SIZE), for firms that experienced lower share price returns prior to announcement (PASTRETURN) and for firms that stated undervaluation as a motivation for the share repurchase (UNDERVAL). For the other variables results are more ambiguous. NMLISTING is highly correlated with firm size and does not seem to provide too much additional explanatory power as compared to SIZE for wider event windows. The coefficients of both CONTROL25 and CONTROL50 are negative but not significant. The coefficient of CONTROL75 always carries a positive sign but is only weakly significant for the reduced model and CAR[-1;1]. Price effects from repurchases that are potentially perceived by investors as a takeover defense device (TARGET) are virtually zero on the announcement day but strongly negative (and slightly significant) when measured over a two- or eleven-day observation period. Finally, the amount of cash on a firm's books does not affect share price reactions at all (CASH).

We interpret these results as providing strong evidence in favor of the signaling hypothesis. Investors seem to be more willing to update their beliefs regarding a firm's current market position and its future prospects if there is a bigger potential for repurchase announcements to provide new information to market participants and if undervaluation of the firm's equity is more likely. Above, we have argued that an undervaluation signal carries more information content for smaller firms, because information asymmetries between managers and investors are assumably larger. We have also argued that undervaluation tends to be more likely if the firm is a value stock with a low market-to-book ratio and if share prices experienced a dip - given that uncertainty is high enough as to whether this dip was indeed justified.

The fact that past share price returns – be they measured in absolute or abnormal terms - are inversely related to announcement effects indicates a deliberate timing of the announcement by management; and deliberate timing is consistent the view that firms use buy-backs to signal undervaluation. 162 of the 224 sample firms experienced negative cumulative stock returns over the thirty-day period prior to announcement.



Table 4: OLS regression results (N=224)

	AR[0]	CAR [-1;+1]	CAR [-1;+10]	AR[0]	CAR [-1;+1]	CAR [-1;+10]
CONSTANT	11.53%*** (0.000)	11.63%*** (0.001)	15.02%*** (0.003)	11.60%*** (0.000)	12.69%*** (0.000)	13.53%*** (0.000)
MTB	-0.51%*** (0.000)	-0.45%*** (0.003)	-0.69%** (0.013)	-0.44%*** (0.001)	-0.38%*** (0.009)	-0.63%** (0.020)
SIZE	-0.93%*** (0.001)	-1.00%*** (0.001)	-1.29%*** (0.003)	-1.01%*** (0.000)	-1.13%*** (0.000)	-1.26%*** (0.001)
NMLISTING	2.95%*** (0.006)	2.43%* (0.058)	2.31% (0.266)			
PASTRETURN	-3.13% (0.243)	-7.430%** (0.033)	-13.56%*** (0.001)	-3.94% (0.155)	-7.95%** (0.026)	-14.09%*** (0.001)
UNDERVAL	0.91% (0.369)	1.83% (0.125)	5.12%*** (0.007)	1.35% (0.172)	2.10%* (0.068)	5.59%*** (0.002)
CASH	0.09% (0.957)	1.56% (0.406)	-0.45% (0.871)			
TARGET	0.21% (0.922)	-3.25% (0.141)	-5.81% (0.127)	0.36% (0.873)	-3.25% (0.131)	-5.80% (0.113)
CONTROL25	-2.09% (0.183)	-1.42% (0.414)	-2.98% (0.227)			
CONTROL50	-1.41% (0.340)	-1.26% (0.490)	-2.00% (0.437)			
CONTROL75	0.23% (0.902)	3.05% (0.155)	2.40% (0.500)	0.91% (0.571)	3.39%* (0.065)	3.84% (0.230)
SERVICE	-2.78%** (0.030)	-3.60%** (0.013)	-4.63%** (0.048)	-2.65%** (0.034)	-3.44%*** (0.018)	-4.67%** (0.042)
FINANCIAL	-2.24%* (0.079)	-2.98%* (0.054)	-3.65%* (0.080)	-3.02%** (0.018)	-3.55%** (0.020)	-4.28%** (0.041)
R <sup>2</sup>	0.218	0.216	0.216	0.184	0.196	0.177
F Stat	4.51	3.98	4.53	5.21	5.426	6.998
Significance F	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Reported results are OLS regression coefficients with White-corrected standard errors (p-values in parentheses). \*\*\* Significantly different from zero at the 1%-level, \*\* significantly different from zero at the 5%-level, \* significantly different from zero at the 10%-level

For these observations,  $CAR[-1;+10]$  is significantly higher at 7.6% as compared to 5.4% for the 62 firms with a positive value for the variable PASTRETURN.<sup>17</sup> We conduct a simple check for deliberate timing. If most of the 162 firms with negative values for PASTRETURN were indeed triggered by poor stock price performance we should not observe too many prior instances in their recent stock price history where prices experienced a dip of similar magnitude. For each of these 162 firms, we therefore counted the number of trading days over the period between AGM approval and repurchase announcement on which cumulative returns over the prior thirty trading days had been similarly bad or even worse than the thirty-day performance prior to announcement. For 59 firms we could not find a single day where this had been the case. However, for the remaining 103 firms we counted on average 28 days with a similar or worse history of declining stock prices. These figures change somewhat if we only consider observations with values for PASTRETURN smaller than -15% (-30%). For 44 (22) out of 81 (39) firms the cumulative stock price performance prior to announcement had indeed been the worst since AGM approval and the average number of days with a similar or worse 30-day history drops to 20 (18) for the other firms. Taken together we find that over half of the sample firms with a particularly poor stock price performance over the thirty pre announcement trading days had not experienced a similar dip since AGM approval. For these firms, cumulative abnormal returns around the repurchase announcement were especially high at  $CAR[-1;10] = 11.9\%$ . We conclude that a number of repurchase announcements in our sample had at least been partially triggered by a poor and, according to the firm's management, apparently unjustified performance and that investors were factoring in past performance in their assessment of the credibility of an undervaluation signal.

Coincident plain statements by managers that they view their firm as undervalued also seem to have measurable effects on abnormal announcement returns. Table 4 shows that cumulative abnormal returns between day -1 and day +10 are on average more than five percentage points higher if a firm made such a statement. This result is surprising given the fact that the statement itself is virtually costless and should therefore lack any credibility. Apparently, however, the market assigns some credibility to it; maybe because managers have to justify that statement in the subsequent AGM. Interestingly to note, IKENBERRY ET AL. (1995) document a similar phenomenon for their sample of 1,239 US open market repurchase announcements that took place over the course of the nineties. 15% of the firms stated a reason for the repurchase in the

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<sup>17</sup> Cumulative abnormal returns during the thirty days prior to announcement were negative for 159 firms. The average  $CAR[-1;+10]$  for this sample was 7.4% as opposed to 5.8% for the 65 observations with positive abnormal past returns.

associated press release and 38 firms stated undervaluation as their primary motivation. Average abnormal returns for this subsample of 38 firms are 5.3% versus 3.5% for the full sample of 1,239 observations. We conclude that a plain undervaluation statement might invigorate an undervaluation signal in a similar fashion as a poor track record regarding recent stock performance.

We find no evidence corroborating the “excess cash”-hypothesis. In section we argued that low market-to-book ratios in conjunction with large cash positions might indicate financial slack on a firm’s books. Cash-based share repurchases reduce financial slack and thereby mitigate agency problems between managers and owners, potentially leading to higher valuations. Although MTB carries the expected sign in Table 4, we do not observe any clear relationship between abnormal returns and a firm’s cash position. While not shown in Table 4 we also ran a regression on an extended model specification that includes the interaction term CASH/MTB. For all three independent variables the coefficients for this interaction term are statistically insignificant. We also tested whether the effect of large cash positions on abnormal announcement returns plays out only for specific control structures, i.e. for cases where the company is largely controlled by inside blockholders who might be in a position to extract rents from outside minority stockholders. It turned out that the coefficients for the concerning interaction terms with CONTROL50 and CONTROL75 variables were statistically insignificant. On a more general level, however, we detect some indication that agency conflicts between inside blockholders and outside minority shareholders are mitigated through repurchases. The coefficients for CONTROL75 are always positive and in one instance also statistically significant. If a firm is controlled by two shareholders with a combined ownership stake in excess of 75% (25 firms in the sample), cumulative abnormal returns are on average roughly 3% higher than for firms with dispersed ownership (49 firms in the sample). We suppose that minority investors of firms with highly concentrated ownership infer from a repurchase announcement that manager interests are now closer aligned to their own interests. Hence, we cannot fully rule out that some German firms repurchase shares to reduce agency problems.

The negative coefficients of the TARGET variable provides some, albeit weak evidence for a negative relationship between abnormal returns and the perception by investors that a buyback transaction aims at deterring a hostile takeover. The fact that coefficients for TARGET are negative only for wider event windows and very weakly significant only for the widest event window CAR[-1;10] may point at a large degree of initial uncertainty regarding the true

motivations of management that can only be resolved after (time-consuming) further investigations.

As already stated above, we are not able to test the validity of the tax-efficiency hypothesis directly. This hypothesis presumes that a firm should substitute share repurchases for dividend payments if capital gains are tax advantaged over dividend income. In Germany, capital gains have enjoyed a more investor-friendly tax treatment over the entire period from 1998 to 2003 than dividend income. Since 2001, the tax differential has been substantial. In 2000 the marginal tax imposed on dividend income was 61.3% for investors in the highest tax bracket and the marginal tax imposed on capital gains was 51.6%. In 2001, taxes on dividends were 59.1% for the same clientele and taxes on capital gains were only 38.4%, implying a tax differential of over 20 percentage points. If repurchases by German firms were strongly motivated by tax efficiency considerations we should observe that firms' propensity to substitute share repurchases for dividend payments increased substantially between 2000 and 2001. In fact, we observe the contrary. According to data from the association of German exchange-listed stock corporations, the total volume of dividend disbursements by German corporations rose slightly from €74 billion in 2000 to €79 billion in 2001. As shown in Figure 1 above the number of share repurchase announcements decreased from 67 in 2000 to 63 in 2001. We conclude that taxation-induced dividend substitution is not an important motivation of German managers to repurchase shares.

In summary, our empirical results show that the overriding motivation of German firms to repurchase shares seems to be undervaluation signaling. We thereby confirm for Germany one of the main results of the extant international literature. However, we find that average announcement effects on share prices are of much higher magnitude in Germany than in other countries ( $5\%+7\%=12\%$  as compared to roughly 3% in the US). There are three potential explanations for this phenomenon. The first is based on international differences in general disclosure requirements for firms. The other two are based international differences in the laws governing share repurchases.

LEUZ/WÜSTEMANN (2004) demonstrate that it is not the primary aim of the German accounting system to maximize information dissemination to outside investors but rather to support private information channels to privileged inside capital providers like "Hausbanks" and large blockholders. Empirical studies show that the information content of financial statements is

indeed less value-relevant and less timely than in the US and the UK<sup>18</sup>. As a consequence, information asymmetries between managers and (outside) investors might generally be larger in Germany than in the two capital market based financial systems. An extra public disclosure by a German firm would then potentially embody more new material information than the very same disclosure by a US or a UK firm. If different degrees of general information asymmetries were indeed the main determinant of country differences in repurchase announcement effects, one should observe similar differences in abnormal returns from other types of announcements. However, GEBHARDT (2001) documents in his survey on the relevant empirical literature that this is not the case. Neither announcements of changes in dividend payouts nor announcements of seasoned equity offerings lead to stronger price effects in Germany than in the US. We therefore tend to reject this first explanation.

The second explanation proceeds from the conjecture that certain German laws for repurchase programs largely rule out repurchases that harm (groups of) shareholders. The obligation to obtain AGM approval and to treat all shareholders equally in a repurchase transaction might be very effective in deterring managers from transferring wealth from one shareholder group to another and from all shareholders to themselves. In contrast, US managers have supposedly much more leeway in designing and timing their repurchase plans. We would hence expect to observe a larger portion of repurchase announcements with negative announcement effects in the US than in Germany. BHATTACHARYA/DITTMAR (2002) report that abnormal returns for the 2,405 US open market repurchase announcements in their sample are on average 3.6% for the event window [-1;+1] and have a standard deviation equal to 9.21%. If we make the conservative assumption<sup>19</sup> that these abnormal returns are normally distributed we obtain a portion of announcements with negative abnormal returns of approximately 35%. For our German sample we find a portion of only 17%. Legal deterrence of repurchases that are not in line with shareholders' interests can hence be assumed to explain international differences in average announcement effects to some extent.

The third explanation holds that the strictness of German repurchase regulation allows for credible undervaluation signals. In section 2 we have argued that the prescribed repurchase process makes misleading announcements costly. These costs would make repurchase announcements less attractive for overvalued firms and would thereby increase the portion of

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<sup>18</sup> See e.g. JOOS/LANG (1994) and HARRIS ET AL. (1994).

<sup>19</sup> GRULLON/MICHAELY (2004) report for their US sample that median abnormal returns are much smaller than average abnormal returns. This implies that the distribution is skewed to the left and, as a consequence, that the true portion of negative returns is probably even larger than 35%.

undervalued firms in the pool of repurchasing firms. Investors might then be induced to attribute a higher credibility to undervaluation signals wrapped in repurchase announcements. GRULLON/IKENBERRY (2000, p.44) nicely paraphrase the situation in the US: “A *primary concern of both regulators and investors is that, because of the flexibility and modest disclosure requirements associated with open market repurchase programs, there is some potential for companies to mislead investors by announcing repurchase programs while having no intention of buying stock*”. As a consequence, investors should treat repurchase announcements by US firms with more skepticism. IKENBERRY ET AL. (1995) show that total shareholder returns for repurchase firms are on average 12% higher than for a control portfolio over the four post-announcement years. Repurchase firms with very low market-to-book outperform the control portfolio by even 45%. The authors conclude that markets largely ignore the information conveyed by US open market repurchases and, as a consequence, systematically under react to undervaluation signals. We argue that, given much stricter repurchase regulations in Germany, under reaction to repurchase announcements is less of an issue in Germany than in the US.<sup>20</sup> Given that undervaluation signaling is the major repurchase motivation of both US and German firms, differences in under reaction patterns might largely explain the differences in repurchase announcement effects. If we take the results of IKENBERRY ET AL. (1995) at face value, average undervaluation of US repurchase firms amounts to roughly 15% at the announcement date. While there is per se no clear reason to believe that actual undervaluation at announcement date should be the same across the two countries, the US figure is in fact quite close to the aggregate announcement effect of 12% that we measure for German firms. To some extent, however, this observation confirms our conjecture that German markets ignore less of the information contained in repurchase announcements. Because ignorance of information is a function of signal strength, and because signal strength is most likely a function of the strictness of repurchase regulation, we are strongly inclined to attribute the large magnitude of German repurchase announcement effects to the specific design of the German laws governing repurchase programs.

## **7. Conclusion**

In this paper we have analyzed abnormal share price returns from German open market repurchase announcements. Share repurchase are only a recent phenomenon in Germany and

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<sup>20</sup> Because long-term post-announcement returns are not yet available for a sufficient number of German repurchase firms we cannot test this hypothesis in this paper.

are governed by fairly strict laws. We aimed to provide new insights on the role that legal ramifications play in inducing corporate insiders to successfully reveal private information on true firm value. For that purpose we measured abnormal price effects around two events, the initial statement by a German firm that it plans to establish a repurchase plan and a firm's actual repurchase announcement. Total abnormal returns around these two events sum up to roughly 12% and are much higher than the 3% typically reported for US repurchase announcements. We tested four hypotheses regarding the primary motivations of German firms to repurchase. Our empirical evidence strongly favors the undervaluation signal hypothesis and thereby confirms the results obtained for other countries. We discussed three possible explanations for the large discrepancy in average announcement effects between German and US firms and identified differences in repurchase regulations as the most likely explanation. The stringent repurchase process prescribed by German law attributes a much higher credibility to undervaluation signals than the lax US regulations.

We conclude this paper with a side note for regulators. The patterns of abnormal returns around German repurchase announcements reinforce the legal requirement that German firms must report an imminent repurchase transaction through a public ad-hoc disclosure. Because the preceding initial statement by managers to seek AGM approval is also accompanied by considerable price effects on average, we are inclined to suggest that such a statement should also be subject to ad-hoc disclosure requirements. Otherwise, opportunities remain for trading by informed insiders, which was outlawed back in 1994 by the 2nd Financial Market Promotion Act. Figure 3 above shows that substantial abnormal returns occurred during the five days before the concerned voluntary statement, thus indicating that insider trading in the context of repurchase transactions might still be an issue in Germany.

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