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Open Market Share Repurchases
in Europe:
A Cross Country Analysis

by

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To my family and my companion in life Andre, for their help, and invaluable support.

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<u>Declaration</u>

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__Abstract__

This thesis addresses the topic of open market share repurchases in Europe over the period 1997 to 2006. This thesis strives to document and clarify the managerial motives as well as the market perception and respective reaction to open market share repurchases, in a cross country framework. Therefore this thesis delves into the hypotheses that have been developed in the literature for interpreting these issues. The theories and hypotheses investigated in this thesis are mainly the information asymmetry and signalling for undervaluation, the tax hypothesis, the dividend substitution, the capital structure adjustment, and agency costs hypotheses under varying regulatory and institutional frameworks.

Consistent with the U.S. evidence, share repurchases are popular in the U.K., but I find that the market does not have the same level of reaction as in the U.S. For Germany and France, share repurchase activity has been a more recent phenomenon, but not common. Nevertheless due to recent regulatory changes, this trend seems to be changing in favour of share repurchases.

The empirical evidence in this thesis shows that market reaction to the announcement of intention to repurchase shares in the open market varies significantly among countries, and that the market becomes more accustomed to subsequent announcements made by the same firms. Furthermore, I find that ownership concentration, firm size, leverage, and in some cases past share price performance, have a significant impact on the market reaction, as well as on the managerial motives for announcing an open market share repurchase programme. Moreover, the evidence shows that not all the managerial motives and drivers of the market reaction have a uniform impact throughout the varying markets. Rather, it is only a number of firm characteristics that consistently influence the likelihood of an open market share repurchase in all three countries. Furthermore, I find that firms on average repurchase approximately three quarters of the shares targeted at the time of the announcement, suggesting that on average, firms repurchase a substantial portion but not the intended amount. In addition, I find that managers repurchase shares in order to provide price support. Finally, this thesis provides evidence that it is the actual trades and their respective reporting, and not the repurchase announcement itself that convey risk related information to the market. Therefore, the reporting of the actual repurchase trades sends positive signals to the market, which are reflected on the reduction of firms' systematic risk.

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Chapter 1.
1. Introduction

In this chapter I discuss the open market share repurchases as a payout method, which has gained an increasing popularity over the recent years. In addition, I discuss the theoretical framework and the respective controversies that provide the motivation for this thesis. Finally, the main empirical findings that are derived from this thesis and its contribution to the body of the existing literature are discussed.

1.1. Introductory Notes

In recent years, share repurchases have been gaining an increasing popularity as a payout method for many corporations. For instance, Dittmar (2008) reports that the use of share repurchases as a payout method in the U.S., shows a fluctuating, but nevertheless, upward trend, with a significant surge starting from 2004. Moreover, the author reports that the annual aggregate volume of share repurchases surpassed the respective volume of dividends on 2005, and that the margin of share repurchases over cash dividends has widened significantly in 2006. This surge in share repurchase activity is supported by DeAngelo et al. (2008), where they show that both gross and net share repurchases surpassed the level of cash dividends after the turn of the millennium. Furthermore, Skinner (2008) shows that net repurchases in the U.S. have exceeded the dividends paid in 1999, 2000, 2004, and 2005. In addition, he reports that the level of aggregate repurchases has grown twice as much in 2004 compared to 1998 to $233bn, which was significantly larger compared to the growth of dividends.

Furthermore, Grullon and Michaely (2004) report in the U.S. that corporations spent approximately 23% of their total annual earnings on share repurchases during 1984 to 2000. Moreover, in 1999 and 2000 they report that the amount spent on share repurchases, for the first time in history, exceeded the amount that corporations spent on dividends. Additionally, Jagannathan et al. (2000), report that the number of repurchase announcements for the period 1985 to 1996 made by U.S. firms has increased by 650%, from 115 to 755, while the respective value of the announcements increased by 750% from $15.4mn to $113bn. While over the same period, cash dividends, although larger than repurchases, have only doubled from $67.6bn to $141.7bn.

On the other hand, in Continental Europe, share repurchases have not been as common as in the U.S., mainly due to institutional and cultural differences. For instance in France, it was not until recently that the legal system was reformed, thus allowing corporations to repurchase their own shares. Under the July 2nd 1998 law, the open market share repurchases can be authorized by a firm's shareholders for up to the limit of 10% of the firm's capital and can extend for a maximum period of 18 months. For each 24-month period, shares representing 10% of a firm's capital can be cancelled or be kept as Treasury stock, which is subject to shareholder authorisation. In the U.K., even though share repurchases were legal since 1981, they started to

become popular in recent years, due to the ambiguity of the tax treatment, and to the negative potential signalling of a shortage of profitable investments.

An increasing number of corporations in Europe have recently announced their intention to repurchase their shares. For instance, Lasfer (2005) reports that the repurchase announcements made by European corporations in 1997 amounted to $47.2bn as opposed to $14.2bn in 1996. It should be noted that the majority of the share repurchase announcements were made by British corporations, where they amounted to approximately 80% of the total repurchases (Lasfer, 2005). In addition, Oswald and Young (2004) report 268 open market share repurchase announcements from January 1995 to December 2000. This is also supported by Rau and Vermaelen (2002), where they report that from January 1980 to June 1998, only 489 share repurchase announcements were made by European companies and 60% of these announcements were made by companies listed in the United Kingdom. This is mainly due to regulatory restrictions, which made share repurchases a forbidding payout mechanism for many Continental Europe countries. For instance, in Germany, prior to the legislation passed on May 1st 1998, share repurchases were treated as illegal, since they were perceived to be a prohibited repayment of capital. But this new legislation, which is based on the European Second Law Directive, opened the way for companies in Germany to repurchase their stock. In France, companies were allowed in 1998 to repurchase their stock and cancel them or keep them as Treasury stock. This trend favouring share repurchases increases with the new legislations coming into effect.

After the amendment of regulations that were already in place, corporations operating in countries such as France and the United Kingdom were able to engage in practices, such as repurchasing their own shares. Keswani et al. (2007), report a dramatic rise in the open market share repurchase activity in the U.K. (196 firms announced their intention to repurchase their shares), for the period April 1999 to December 2002, due to the abolition of advance corporation tax on April 5th, 1999. This is because the abolishment of ACT lifted the tax burden on both dividends and share repurchases, which made these two forms of payout attractive. This is also supported by Ginglinger and Hamon (2007), where they report for a three year period (January 2000 to December 2002), 371 repurchasing firms in France, relative to the 51 repurchase announcements made in the period 1985 to 1998 (Lasfer, 2005), which is before the change in legislation took place. In addition, Ginglinger and Hamon

(2007) report that approximately 40% of French firms repurchased their shares during the sample period, which highlights the significance of the effect that different regulatory frameworks can have on share repurchases.

The purpose of this thesis is to shed ample light on the relatively unexplored area of open market share repurchases. For achieving this goal, I identify a diversified sample of firm announcements of intention to repurchase shares in the open market that took place in the United Kingdom, France and Germany. The data are hand-collected, for the period 1997 to 2006. Hence, this heterogeneous, from an institutional, cultural and regulatory point of view, sample of open market share repurchases, allows me to analyse the existing theories related to share repurchases and identify what are the managerial motives for announcing an open market share repurchase programme; what is the market reaction to such announcements; what are the determinants of the markets' reaction to open market share repurchase announcements; if firms truly repurchase the amount of shares targeted at the time of the announcement; and finally, if there are any risk changes throughout the entire process of open market share repurchases, i.e. from the time prior to the announcement, to the actual implementation, completion, and the period after the end of the repurchase programme.

1.2. Theoretical Framework and Motivation

Share repurchases can take place in the following four forms: (1) the open market, where shares are repurchased through a broker at the current market price and usually in a long time horizon, (2) fixed-price tender offer, where a firm offers its shareholders to buy back a specific number of shares at a given price before a given expiration date, (3) Dutch auction, where a price is not specified in advance, rather the firm sets a range of prices within which it is willing to repurchase its shares, or (4) Privately negotiated repurchases which is done via direct negotiation with a major shareholder.

From the corporation's perspective, the benefit of a fixed-price tender offer and a Dutch auction is that the firm can retire a large block of shares in a relatively short period (usually a month), which can also be an efficient acquisition defence mechanism. Moreover, firms that undertake fixed-price and Dutch auction share repurchases, offer a large "premium" to the tendering shareholders, compared to the

firm's share price prior to the share repurchase. For instance, Masulis (1980) and Comment and Jarrell (1991), report an excess return of 16% for fixed-price tender offers, whereas for Dutch auctions Louis and White (2007) and Grullon and Michaely report an excess return of 12.5%. Furthermore, privately negotiated transactions can take place at a premium, at the market price or at a discount (Grullon and Ikenberry, 2000). These repurchases are taking place mainly to provide liquidity to investors that want to exit rapidly or when a firm wants to repurchase shares from a potential hostile bidder. Nevertheless, the open market share repurchases are by far the most popular method of repurchasing shares due to their flexibility in both the price to be paid and the timing of acquiring the targeted shares (Allen and Michaely, 2003; Grullon and Ikenberry, 2000). Even though open market share repurchases are the most economical way of repurchasing stock, quite often they are subject to volume and price restrictions.

When companies announce their intention to repurchase their shares, stock prices tend to increase. A number of studies, the majority of which is investigating the U.S. market, have tried to provide an explanation for this phenomenon and document the reasons and motives for undertaking a share repurchase. The most widely accepted explanations are the benefits from improved capital structure, signalling of undervaluation and/or improvement of future cash flows, the reduction of agency costs, the capital gains tax benefits, and flexibility that share repurchases can offer (Ikenberry et al., 1995; Vermaelen, 1981; Comment and Jarrell, 1991; Mitchell and Stafford, 2000; Jensen, 1986; Barclay and Smith, 1988; Grullon and Michaely, 2002).

According to the signalling hypothesis, a good firm can separate itself from a bad firm by giving a costly signal to the capital markets, since the bad firm will not be able to mimic this signal because it would be costly. Specifically, the signalling of undervaluation hypothesis suggests that since managers are better informed, and have a better understanding of the firm, they can identify if the current share price reflects the true value of their firm. Therefore, in order to signal the mispricing of their firm, managers announce a share repurchase programme in order to alert the market that their firm is trading at a low price.

Vermaelen (1981) argues that tender offers are costly signals, due to the premium that a corporation pays to its shareholders for their tendered shares. The author reports an average cumulative abnormal return (CAR) of approximately 16% on the day of the announcement for the case of tender offers, which reaches 17% for

the days following the announcement. In addition, Louis and White (2006) report an average abnormal return for fixed-price tender offers of 16.6% over the event window [-3, +3] of the announcement and 10.9% for Dutch auctions but not statistically significant. Furthermore, Masulis (1980) investigates the impact of fixed price tender offers in the U.S. and finds that the market reaction for the announcement window [0, +1] is approximately 16%.

The motive for signalling is particularly important in the case of fixed price tender offers, where management offers shareholders a tendering price at approximately 16% above the current share price for their shares (Comment and Jarell 1991). These results are also aligned with Peyer and Vermaelen (2005) who report a statistically significant abnormal return for the two days surrounding the announcement date [-1, +1], of 7.68% for the case of tender offers and 7.60% for the case of Dutch auctions.

According to Louis and White (2006), fixed-price tender offers are more likely to be used as a signal of positive information than Dutch auctions. By contrast, in Dutch auctions where management is basically retrieving information from the market, thus revealing less information about their own views, the premium paid is approximately 12.5%.This leads to the conclusion that the signalling through Dutch auctions is weaker. Nevertheless, Dutch auctions seem to be preferred by companies who want to repurchase large portions of their stock, in a short period of time and pay a smaller premium. Hence, these empirical studies reinforce the argument that tender offer and Dutch auction repurchases are considered by the market to be more credible signals, due to the incurred cost that accompanies them. In this case, the incurred cost is the premium that the firm pays to its shareholders in order to motivate them to tender their shares in such a relatively short period of time.

Grullon and Ikenberry (2000) report that the market reaction to the announcements of open market repurchases is approximately 3.5%, whereas the reaction to fixed-price tender offer repurchase announcements is about 15%. This substantial difference on the positive reaction towards the fixed-price repurchase reflects the degree of credibility as a signal, since fixed-price repurchases are commitments for a corporation and are costly to undertake. Nevertheless, this credibility does not come cheap for the corporation, since it has to pay a premium to its shareholders in order to make them tender the targeted amount of stocks. Therefore the market translates such an announcement as a signal of the management's belief

that the firm's stock is undervalued. Moreover, if the open market repurchases were indeed costly for a corporation to announce them, then it would be a more convincing sign, thus enabling the market to have an even more positive reaction to such an announcement. Furthermore, concerning the market's underreaction to an open market repurchase announcement, it can be argued that the market is sceptical about the management's claims and underlying signals (Grullon and Ikenberry, 2000).

In an early research study, Stewart (1976) examines the stock market performance between repurchasing and non-repurchasing firms, and finds evidence that repurchasing firms outperform non-repurchasing firms but only after several years following the repurchases. It should be noted though, that there is a number of drawbacks in Stewart (1976). Firstly, the author does not differentiate between the types of share repurchasing. Secondly, the research paper focuses only on the performance following the actual repurchases and not the announcement. And finally the author does not adjust the realised returns for risk.

In a more recent research study Ikenberry et al. (1995) investigate a large sample of open market share repurchases in the U.S. and report that repurchasing firms show positive and significant compounded excess returns of approximately 12% in the four year period following the announcement. Hence, suggesting that the market fails to grasp and utilise the information in stock prices promptly. Moreover, the reported findings suggest that the undervaluation theory is more applicable to value-stocks (securities that have high book-to-market ratios) where the cumulative abnormal returns for value stocks over the four year period amount to approximately 45%, whereas for growth stocks, they amount to approximately -4%.

These results are in line with McNally and Smith (2007) who investigate the effects of the open market share repurchases in Canada and report a median abnormal return of 3.31%. Nevertheless, Ikenberry et al. (2000), investigate the effect of open market repurchases in Canada and report a modest average abnormal return of only 0.93% for the days surrounding the announcement, during the month the repurchase programme was announced. These results are fairly lower compared to those reported in the U.S. studies of approximately 3.5%. Moreover, in Ikenberry et al. (2000), the abnormal performance of repurchasing firms in Canada, is approximately 9% per year for value stocks, while for growth stocks it is roughly half of this amount, for a three year holding period. This difference between value and growth stocks appears to follow the same pattern as the one reported in Ikenberry et al. (1995), where they

investigate the open market repurchasing effects in the U.S. market. A potential explanation for this moderate reaction around the repurchase announcement on the Canadian market is that the market seems to underestimate the information contained in share repurchase announcements (Ikenberry et al., 2000).

So far, the average announcement price effect of an open market share repurchase is approximately 3.5%, as reported in a number of U.S. studies. But this does not seem to be the case for open market share repurchases in the European markets. In the trifling literature investigating share repurchases in Europe, Lasfer (2005) and Rau and Vermaelen (2002) report an excess return during the three day window [-1, +1] surrounding the open market share repurchase announcement, of approximately 1.64% and 1.08% in the U.K respectively, and both for the time period 1985 to 1998. Similarly, Oswald and Young (2004) report a market reaction on the announcement of an open market share repurchase in the U.K. of 1.24% during 1995 to 2005. Furthermore, Ginglinger and L'Her (2006) report an average excess return of 0.57% over the time window [0, +1] in France.

Previous studies also document a positive relationship between the amount of shares targeted at the time of the open market share repurchase announcement, and the market reaction at the time of the announcement (Ikenberry et al., 1995; Grullon and Michaely, 2002). In addition, Ikenberry et al. (1995), Comment and Jarrell (1991) and Vermaelen (1981) report a similar in magnitude negative abnormal return of approximately 3%, during the month prior to the announcement of intention to repurchase. This suggests, that signalling of undervaluation can be a strong motive for announcing a share repurchase. Therefore, this finding, in combination with the fact that the larger the proportion of shares to be repurchased, the larger the market reaction, suggests that managers use share repurchases in order to signal to the market their belief that their firm's current share price is undervalued, and therefore a bargain.

Nevertheless, there is a drawback with this argument. The announcement of an open market share repurchase does not constitute a costly signal, since the repurchased shares are bought at the current market price and not at a premium. Moreover, the announcement of a share repurchase programme is not a commitment to the firm. Thus, when companies announce a repurchase programme they do not always undertake them or complete them in full. Stephens and Weisbach (1998) find that firms announcing an open market share repurchase in the U.S., repurchase either

a substantial fraction of the announced shares or almost none at all. In addition, they find that approximately 74% to 82% of the targeted shares are repurchased on a later time after the announcement, and that it takes approximately three years for almost half of the firms of their sample (57% of the sample) to repurchase the targeted number of shares.

This illustrates the flexibility that open market share repurchases offer to management, but also the market's uncertainty whether this programme will be undertaken and in which time horizon. Therefore, this can lead to the argument that even a bad firm can mimic a good firm by announcing a repurchase programme without intending to undertake such a programme, since there is no commitment for the firm to do so. Consequently, it can be argued that signalling of undervaluation to the market via an open market share repurchase announcement cannot be a credible signal. On the other hand though, buying back overvalued shares is costly, because the price is likely to drop at some point. In addition, a good firm can separate itself from a bad firm by sending a costless signal to the market, thus attracting the market's scrutiny. In contrast, a bad firm will not mimic this action since it will not want to be discovered by the market (Bhattacharya and Dittmar, 2003).

According to the traditional finance theory, because debt payments are excluded from income and subsequently from the taxes paid by the firm, then the value of the firm should increase with the substitution of debt for equity. Nevertheless, when debt increases, then the risk of the firm also increases (due to the increased probability of incurring direct and/or indirect bankruptcy costs), which increases the costs associated with debt. Therefore, there is a trade off between the tax benefits of debt and the costs and risks associated with higher debt (Ross, 1977). Moreover, Ross (1977) argues that because higher debt is associated with higher risk, then it should be perceived by the market as credible signal of a more productive firm. In addition to this argument, as share repurchases absorb equity and therefore increase the firm's leverage ratio, the firm may use a share repurchase to achieve its target debt ratio (Bagwell and Shoven, 1988; Hovakimian et al., 2001). Consequently, when a firm finances a share repurchase programme by raising debt, then share repurchases can be considered as being more credible signals.

However, when a firm repurchases its shares it has the option to keep the repurchased shares as Treasury stock. This gives management the ability of better managing the balance between debt and equity, providing more flexibility in fund

raising by reissuing stocks when necessary, better managing employee stock options (share schemes), disposing the shares when necessary, permitting the investment in a company's own shares, as well as being used as a hostile takeover deterrent. But keeping Treasury stock can be a cause of concern for the market, due to the possible market interference by the firm who repurchases and resells its own stock, and the potential danger for share price manipulation[1]. Therefore, when share repurchases are used for increasing the firms' Treasury stock, they may not be a strong signal to the market.

In sum, firms that wish to signal their undervaluation are more likely to undertake a fixed-price share repurchase, since it is a commitment to the firm and it is associated with a premium cost that needs to be payable to the existing shareholders, thus making them more credible signals to the market. Nevertheless, fixed price repurchases are not considered to be a common practice. The most preferred method for repurchasing stock is the open market share repurchase. This is mainly due to the flexibility in the time frame that firms are required to undertake such a programme, the price they need to pay, and the lack of commitment for completing or even initiating the announced share repurchase programme (Grullon and Ikenberry, 2000).

As discussed earlier, managers can have superior information about their firm and its true value. On the other hand though, professional and institutional investors can also have as much or even superior information than managers. Moreover, it is not clear if managers have the ability to identify and exploit opportunities of executing the actual share repurchases in a timely manner.

Previous studies could not investigate managers' timing ability on executing the actual repurchase trades due to difficulties in measuring the amount of the actually repurchased shares, as U.S. corporations are only required to disclose the number of their shares outstanding at the end of each quarter. In an attempt to overcome this obstacle, Stephens and Weisbach (1998) use the quarterly changes of a firm's common shares outstanding as an approximation for measuring the actually repurchased shares. Cook et al. (2004) use voluntarily disclosed data and find that firms repurchase their shares following drops in the share price. Ikenberry et al. (2000) investigate the actually repurchased shares in Canada, where firms are required to disclose the number of the actually repurchased shares on a monthly basis. The

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[1] It should be noted that share repurchases do not dilute the per share value of the firm (Fenn and Liang, 2001; Mitchell and Dharmawan, 2007).

authors find evidence that the changes in price have a significant impact on the firms' repurchase activity. This suggests that managers have timing ability and trade strategically. In contrast, Dittmar and Dittmar (2008) find no evidence of firms' timing ability of buying their shares when they are undervalued since they find no evidence of undervaluation, captured by the market-to-book ratio and share price performance, as having an impact on actual share repurchases. Rather, they find that share repurchases are responses to cyclical business waves and excess cash holdings.

However, the aforementioned studies use quarterly data (Stephens and Weisbach, 1998) or monthly data (Ikenberry et al., 2000; Dittmar and Dittmar, 2008) or employ voluntarily disclosed data (Cook et al., 2004). Furthermore, Oswald and Young (2004) investigate the U.K. market, and find that when share prices fall, managers tend to repurchase more shares. However, they investigate the impact that the undervaluation hypothesis has on the actual share repurchase trades, and not on the timing of execution of the share repurchase trades. Hence, it cannot be clear whether managers repurchase shares due to market timing or price support. Consequently, from the aforementioned studies, it is difficult to acquire a precise understanding of the number of shares actually repurchased and the timing of execution of the actual repurchase trades.

In order to overcome this limitation, Zhang (2005) and Ginglinger and Hamon (2006) investigate the share price performance during the actual share repurchases in Hong Kong and France respectively. Zhang (2005) finds evidence that managers are repurchasing shares after the share price declines. In addition, the author finds that the share price shows a positive and significant performance for the twenty days following the actual share repurchase trades, suggesting that managers time the market and trade opportunistically. In contrast, Ginglinger and Hamon (2006) find that managers repurchase shares during periods subsequent to falling prices, but find no evidence of the share price improving afterwards. This suggests that managers repurchase shares in order to provide price support. These findings lead to the formulation of the market timing and price support hypotheses. According to the market timing hypothesis a firm's share price should be lower on repurchase days compared to subsequent non-repurchase days, whereas the price support hypothesis predicts that a firm's share price should be lower on repurchase days than on prior non-repurchase days.

The agency costs hypothesis, which is one of the prominent explanations why firms are making a payout to shareholders, entails that it can be used as a self-discipline mechanism imposed on managers. In a qualitative study, Easterbrook (1984) paved the way for the agency costs of free-cash-flows hypothesis, by arguing that dividends play a significant role in controlling equity agency problems. This could be achieved by facilitating primary capital market monitoring and imposing controls on a firm's activities and overall performance. Furthermore, the author argued that by making higher payouts to shareholders, the likelihood to sell common stock in primary capital markets will increase. Thus, the management's power will be reduced, by decreasing its resources under control and will make it more likely to be better monitored by the capital markets. However, Easterbrook (1984), in his theory does not take share repurchases into consideration as a payout method. This is due to the fact that share repurchases were not popular in the early 1980s. In line with Easterbrook's (1984) theory, Jensen (1986) argues that payouts can be used as a mechanism of self-imposed discipline on managers. He suggests that equity holders can minimise the cash that management controls, thus reducing the opportunity for managers to undertake uncontrolled large spendings and/or invest in negative NPV projects that could hurt the existing shareholders. One way to prevent management to engage into such actions is to increase the payout to shareholders, thus reducing any excess cash.

Contradicting this theory though, Brav et al. (2005) surveyed 384 financial executives, in order to determine the factors that drive dividends and share repurchases. They find that not a single manager agreed with the assertion that firms pay dividends so that they can attract a particular investor clientele that may monitor them. In the interview findings, most executives do not view payout policy as a means of self-imposing discipline. Furthermore, almost 87% of executives surveyed do not think that the discipline imposed by dividends is an important factor affecting dividend policy. Likewise, approximately 80% of executives believe that discipline imposed by share repurchases is not important. One drawback that might arise in Brav et al. (2005), also noted by the authors, is that managers might not admit even to themselves, that at times they may need someone to monitor, or impose discipline on their actions. Further, it is possible that managers respond to market pressures in order to distribute dividends. These market pressures reflect investors' demands that the firm makes a payout in order to restrict free-cash-flow problems. Nevertheless their

results are consistent with the empirical results by Grinstein and Michaely (2005), who find that institutional investors prefer dividend paying firms than the non-dividend-paying firms, but also find that institutions show no preference for corporations that pay a high level of dividends. Moreover, they find that institutions show a preference for firms that repurchase their shares. However, they find that firms that have a high level of repurchasing activity have a higher level of institutional investors.

Grullon and Michaely (2004) find evidence, which is consistent with Jensen's (1986) free cash flow hypothesis. They find that repurchasing firms demonstrate a decrease in their current level of capital expenditures, as well as their research and development (R&D) expenses. Additionally, they report a decline of the firm's cash reserves and more importantly, a stronger market reaction to the announcement of intention for share repurchases, for firms that are more likely to over-invest. In extension to that argument and aligned with the agency cost hypothesis, Fenn and Liang (2001) find that management stock options, and a more volatile operating income have a positive relationship with share repurchases, suggesting that share repurchases are employed in order to reduce potential agency costs.

Furthermore, Grullon and Michaely (2004) suggest that repurchases may be linked with firms that pass from a high growth level to a lower growth level. Since firms have fewer opportunities to grow, their assets have an increasing role on determining the value of the firm, thus decreasing their systematic risk. As a consequence, the firm's cost of capital declines. Thus, they argue that since the levels of reinvestment decline, there is an increase in free-cash-flows which increases the probability of over-investment by management, which in turn increases the likelihood of a payout to shareholders. Oswald and Young (2008) perform an empirical study in the U.K. and find that non-repurchasing firms that have similar characteristics to repurchasing firms are consistently overinvesting. Therefore, since a firm that does not repurchase its shares is more likely to overinvest, and because the market is already aware of that, it has a positive reaction towards share repurchases. This is also reflected on the repurchasing firms' reduction of systematic risk. Consequently, share repurchases may be linked to a reduction in systematic risk and capital expenditures.

Grullon and Michaely (2004) test the validity of the free-cash-flow hypothesis, along these dimensions, for a six year period around the repurchase announcement. They find that repurchasing firms experience a significant decline in systematic risk

and cost of capital, relative to their non-repurchasing peers[2]. Additionally, they find that firms which experience a larger decline in capital expenditures and R&D expenses are the ones who experience a larger decline in systematic risk.

Berk et al., 1999 argue that the value of firms that are more likely to experience lower growth opportunities, is more likely to be determined by their current assets in place. This consequently leads to a reduction of systematic risk. In addition, the authors argue that good news is associated with a decline in systematic risk and bad news with an increase in systematic risk. What is more, Grullon et al. (2002) argue that the market is already aware about a firm's decline in future growth and profitability. Therefore, the announcement of a share repurchase can attract more scrutiny on the decline of future growth and systematic risk. This argument is in line with the findings of Lintner (1956) and Brav et al. (2005), according to which managers are willing to increase payouts when they believe that their firm's future cash flows and profitability are less risky.

Further, Dann et al. (1991) and Hertzel and Jain (1991) study the potential of firm risk changes, surrounding tender offer share repurchase announcements in the U.S. market and find evidence that firm risk is declining from the year before the announcement and keeps declining even after the announcement. Therefore, suggesting that tender-offer share repurchase announcements convey information to the market, that is related to the firms' risk status. In contrast, Dennis and Kadlec (1994) who initially find that the estimated systematic risk of a firm announcing a tender offer changes after the announcement, still argue that any changes in risk are due to estimation biases. Hence the changes in systematic risk reflect mostly the changes in capital structure and the post offer trading activity rather than the actual systematic risk change due to the tender offer.

Studying the relationship between firm risk and open market share repurchases in the U.S., Bartov (1991) finds that firms who announce their intention to repurchase their shares in the open market, have a significantly higher risk compared to their peers and experience a significant decline during and after the year of the announcement. Contrary to the argument of the risk change hypothesis, Peyer and Vermaelen (2008) argue, that because they still find evidence of abnormal returns with Ibbotson's RATS methodology, which performs monthly adjustments for risk

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[2] The changes in systematic risk translate to an economically significant decline in risk premium of 15% per year.

changes after the repurchase announcement, the long-term returns of repurchasing firms cannot be explained as the market's underreaction to changes in risk. Hence, the authors argue that the announcement of a share repurchase does not imply that a firm may be undervalued due to a potential performance improvement in the future, but due to the market's mistaken belief that the firm's future performance will decline.

An additional and much discussed hypothesis concerning share repurchases, is the capital structure hypothesis. When corporations use their excess capital in order to repurchase their shares, they reduce their equity capital and consequently increase their leverage ratio. Hence a share repurchase can reflect the managers' preference to use debt instead of equity financing, in order to move closer to their target (optimal) leverage ratio (Bagwell and Shoven, 1988; Hovakimian et. al., 2001). Therefore, firms can adjust their equity-capital ratios in a relatively short period of time. But this is most clear in the case of tender offers where corporations usually retire large blocks of their stock, thus increasing their leverage. In the case of open market share repurchases, which is the most common method for repurchasing shares, the capital adjustment does not appear to be the primary motive (Grullon and Ikenberry, 2000). Rather, the authors argue that open market repurchases can be used by corporations in order to make smaller capital adjustments in a short period of time, hence being able to "fine-tune" their leverage ratios.

In contrast, Mitchell and Dharmawan (2007) and Dittmar (2000) find evidence that companies are more likely to repurchase their shares when their leverage ratios are below their respective target leverage ratios. Furthermore, Hovakimian et al. (2001) find that more profitable firms that have lower leverage ratios are more likely to repurchase their shares than retire debt. Moreover, Jagannathan and Stephens (2003) report evidence suggesting that firms, who have lower debt ratios, repurchase their shares more frequently. Hence, suggesting that firms repurchase their shares when their leverage ratios are lower than their optimal levels.

Apart from the theories previously discussed, the existing financial theory suggests that tax provisions can play an important role on determining corporations' cash distribution to its shareholders. Assuming that managers make decisions and act to their shareholders' best interest, and taking into account that share repurchases have the advantage of allowing investors to be taxed at capital gains rather than income tax, which is usually higher, one can see the magnitude of the effect that tax can have on payout policies. In addition, when the rate of capital gains tax is lower than the rate of

personal income tax, then share repurchases are more beneficial and a more efficient payout method.

Barclay and Smith (1988) argue that from the two most commonly used forms of cash distribution to shareholders, namely, cash dividends and open market share repurchases, the later should be more "popular" compared to dividends, due to the tax advantage. This tax advantage is based on the notion that share repurchases are usually taxed as capital gains rather than personal income tax. Since the rate of capital gains tax is lower compared to the respective rate of personal income tax, therefore, share repurchases can be more beneficial to shareholders compared to cash dividends. Nevertheless, up to the time when the research of Barclay and Smith (1988) took place, dividends were overwhelmingly used compared to any other form of cash distribution. Furthermore, Dittmar (2000) argues that if tax is the driver of firms' decision to repurchase, then the volume of repurchased shares should be inversely related to the relative capital gains tax. However, the author finds that the changes in tax laws cannot provide a sufficient explanation for the changes in the repurchasing trends.

In contrast, Grullon and Michaely (2002) find that the differential tax advantage does have a significant effect and it is positively related to the market reaction surrounding open market share repurchase announcements. Consistent with these findings, Lie and Lie (1999) report evidence that managers are more likely to repurchase shares, either by a tender offer or in the open market, than distribute dividends when their shareholders' income tax rate is higher than the capital gains tax. Furthermore, the authors find that managers are more sensitive to their respective shareholders' tax status when there is a large fraction of institutional investors. Moreover, Masulis (1980) reports evidence derived from the U.S. market, suggesting that the tax effect on fixed price tender offers is persistent as well as the fact that the corporate tax benefit of financing a stock repurchase with debt has a significant impact on the market reaction.

Aligned with Lie and Lie (1999) and Grullon and Michaely (2002), are the findings of Rau and Vermaelen (2002), where they argue that tax changes do have a significant effect on the importance and method of share repurchase in the U.K. The authors find that a firm's payout policy is indeed sensitive to tax changes and, as in Lie and Lie (1999), that the tax treatment of the majority of a firm's investors, such as institutional investors, determines the payout policy. They report that for every time

period where repurchases looked more attractive than dividends from a tax perspective, the number of announcements increased substantially compared to the number of announcements when dividends looked more appealing, again from a tax perspective. In addition, Kooli and L'Her (2010) report evidence from Canada that the tax advantage of capital gains tax relative to income tax has a significant impact on a firm's decision to repurchase its shares.

Furthermore, Julio and Ikenberry (2004) address the issue of taxation on corporate payout policies in the U.S., and especially on the choice between cash dividends and share repurchases. In order to do so, they investigate the impact of the Jobs and Growth Tax Relief Reconciliation Act of 2003, which resulted in a reduction of the income tax rate to 15%, thus becoming equal to the respective capital gains tax rate, and consequently reducing the tax advantage of share repurchases. However, they argue that even with the income tax and capital gains tax rates being level, the capital gains for non-selling shareholders are deferred, and hence it is not imposed periodically. Moreover, the 15% capital gains tax is imposed not on the full repurchase proceeds received by a firm's shareholders, (as it is the case with cash dividends where tax is applied on the full dividend proceeds they receive), but only on the portion of the repurchase proceeds that exceeds each shareholders' historical cost basis on the shares sold (DeAngelo et al., 2008). Therefore, share repurchases still had a tax advantage over cash dividends. Nevertheless, Julio and Ikenberry (2004) find that after the income tax cuts, there was a considerable increase on the rate of dividends paid by comparatively low-dividend paying firms. Furthermore, they find a sharp increase on the number of firms initiating dividends. Nevertheless, the authors argue that the tax issue is only one of a number of factors that influence corporate payout policies.

According to the existing literature, one view is that given the flexibility and tax advantage that share repurchases can offer, they can substitute cash dividends as a payout to shareholders. However, firms which already pay regular cash dividends have the necessary resources to implement an open market share repurchase. Hence, share repurchases can be viewed as complements rather than substitutes to dividends (Jagannathan et al., 2000). DeAngelo et al. (2000) examine the relation of the disappearance of special dividends with the surge of share repurchases and find no evidence of dividend substitution. Similarly, Dittmar (2000) and Fama and French (2001) find no evidence of the open market share repurchases as being substitutes to

cash dividends. Skinner (2008) argues that dividend paying firms, and firms that pay dividends but also repurchase their shares, have a long dividend paying history. Furthermore, the author finds evidence that the number of years that firms have been paying dividends has a significant impact on the overall payout mix, which supports the importance of dividend history. In addition, he finds that younger firms that have not paid dividends are more prone to share repurchases, which, now that these firms are becoming mature, are still more likely to use share repurchases as their dominant payout method. Furthermore, he finds that the importance of dividend payers decreases over time suggesting that share repurchases have become a dominant form of payout.

This supports the life-cycle theory of payout policy according to which firms are dealing with a trade off between the factors that encourage retention and flotation costs, the agency costs that arise from the free cash flows and other factors that may discourage it (DeAngelo and DeAngelo, 2008). However, this trade off evolves throughout the life cycle of a firm since its ability to raise capital for investing in new opportunities, as well as the scale of available investment opportunities, also change through time. This means that younger and high growth firms have more available choices for profitable investments and smaller ability to generate cash internally, and therefore are less likely to make payouts to their shareholders. This is contrary to larger and more mature firms that have fewer investment opportunities and have larger amounts of cash, which they will be more prone to distribute back to their shareholders via dividends or share repurchases (DeAngelo and DeAngelo, 2008).

Furthermore, Jagannathan et al. (2000) re-examine Lintner's (1956) argument, according to which, managers prefer to increase dividends regularly, and avoid decreasing them if possible. Therefore, dividend increases will be related to permanent but not necessarily to temporary cash flows and that dividend cuts will be less frequent than increases, and they should be accompanied by poor performance. The authors find that dividends appear to be paid by permanent earnings and they find little evidence of subsequent earnings improvements following dividend increases. Additionally, they find that firms who pay dividends have more stable earnings compared to firms who repurchase their shares. Even though their findings do not provide strong support on the dividend substitution hypothesis, their results suggest that repurchases overlap dividends to some extent. Furthermore, Dittmar (2008) finds that both share repurchases and cash dividends are employed in order to pay out more

permanent earnings. Therefore, the author argues that share repurchases can be viewed as being both substitutes and complements to dividends by paying out both permanent and unexpected earnings respectively.

In contrast, Grullon and Michaely (2002) argue that if one looks at the sources and the uses of funds' identity, then cash dividends and share repurchases should be viewed as substitutes, if all else is constant. Even though the authors admit that firms can always adjust their sources of funds, thus making it possible that shares and dividends are determined independently, still they find strong evidence in support of the dividend substitution hypothesis. Additionally, they do not find any evidence that dividend-paying firms who repurchase shares have, on average, more volatile earnings than firms who solely pay dividends. Furthermore, Skinner (2008) finds a strong link between earnings and firm payouts, and especially a significant and positive relationship between profitability and the choice to repurchase. He shows that changes in earnings help explain changes in the choice of payout policy, and that share repurchases increasingly substitute the payment of cash dividends.

Another issue that the existing literature has addressed concerning the effects of share repurchases, is the effect it has on the liquidity of the firm. Intuitively, when corporations decide to repurchase and cancel their shares and especially in the case of cancelling large blocks of shares, the respective liquidity should decline. This is due to the reduction on the number of shares available for trading and the number of investors capable of trading. Thus, it is argued that if liquidity declines, then the firm's share price should also decline.

However, this is not always the case, because liquidity could be affected positively by the firm's trades throughout the repurchase process. According to a number of finance theorists, the presence of the firm, which is considered to have no informational gap, should increase the percentage of better informed traders, thus providing an informational edge over other investors. Barclay and Smith (1988) argue that if there is no gap of information between management and market participants, then the increased market activity from repurchase programmes should not have any adverse effects on the firm's liquidity. Moreover, share repurchases could provide more competition for the firm's market-maker. By placing limit orders on the price firms are willing to pay for their own shares, a limit price could be established on the bid side to the possible extent where the bid-ask spread is reduced, thus increasing the firms' liquidity and increasing their value. This theory is labelled by Barclay and

Smith (1988) as the competing-market-maker hypothesis, and they find that share repurchases can have a positive effect on a firm's liquidity

Nevertheless, there is a drawback with these findings since the authors use annual bid-ask spreads to document changes in liquidity, thus it is not possible to examine when exactly this change takes place relative to the announcement of a share repurchase, which could have distorted the conclusions on the actual announcement effect. In order to overcome this obstacle, Singh et al. (1994) analyse the daily bid-ask spreads around the announcement of an open market share repurchase. The authors find no evidence of change on the bid-ask spread on the post announcement period thus arguing that repurchase announcements do not cause an increase in spreads. Consistent with these findings, Franz et al. (1995) find a net decline in bid-ask spread percentage, when controlling for inventory-holding and order-processing costs. The authors attribute the spread percentage decrease to the reduction of the informed trading costs related to the repurchase announcement. Moreover, Miller and McConnell (1995) and Kim (2005) find no evidence of share repurchases having a significant impact on a firm's liquidity. On the other hand, Ginglinger and Hamon (2006) employ daily data, and find evidence that share repurchases in France have a negative effect on a firm's liquidity.

Apart from the different effects, interpretations and dynamics that share repurchases have, still, they are subject to varying legislation and regulatory frameworks from country to country. Especially in Continental Europe countries, where share repurchases are subject to several legal restrictions, such as the volume and the time frame in which it can take place, the effects of share repurchases could vary significantly across countries. This is contrary to the U.S., where there is no limitation concerning the volume and the time limit for carrying out a share repurchase programme.

So far, the overwhelming majority of the literature has studied the effect of share repurchases and their underlying reasons and motives in the U.S. market, without taking into account the effects that the regulatory frameworks can have on the repurchase mechanism. For instance, it was not until recently that share repurchases were made legal in Germany and France. When the regulations changed, corporations started to have a more favourable view on the open market share repurchases.

It can be clear that regulatory restrictions can have a significant effect to some of the main characteristics of share repurchases, such as the flexibility on the time period

to undertake the programme and the volume of shares intended to be reacquired by a firm. Therefore, it is not possible to draw inferences from the U.S. empirical results and apply them to countries such as Continental Europe, where stringent regulations are imposed on share repurchases. This argument is also supported by Rau and Vermaelen (2002), Lasfer (2005), Oswald and Young (2004) and Keswani et al. (2007) where they investigate share repurchases in the United Kingdom and their results are lower than the average results reported in the U.S. empirical studies. Additionally, the results reported by Ginglinger and Hamon (2007) appear to be different and lower than the ones reported in the U.S., Canadian, and U.K. studies, suggesting that the markets react differently across countries

Concerning the regulatory differences among countries, La Porta et al. (1996) have shown that legislation among countries differs significantly in areas such as shareholder protection and law enforcement. From that perspective, they have shown that Continental Europe countries can be distinguished into three categories. Common law countries such as the U.K. where the level of shareholders' protection is the highest among Europe, German Civil law and Scandinavian Civil law where the level of protection is moderate, and finally French Civil law where the respective level is the lowest. Moreover, shares typically give rights to their owners, such as the right to vote for companies' directors (La Porta et al., 1998). These rights give shareholders the ability and the power to apply pressure on managers in order to receive the returns on their investment. Nevertheless, these rights depend on the legal framework in which securities are issued. Therefore, the quality of the legal framework and law enforcement can be of important significance for what specific rights and protection shareholders actually have (La Porta et al., 1998). Thus, these regulatory differences among countries can have a significant effect on how corporations choose to make a payout to their shareholders, and more specifically on the choice for undertaking a share repurchase.

La Porta et al. (1997) identify the United Kingdom as a market-oriented country whereas the rest of Continental Europe countries as bank-based. The difference between the two types is that in the U.K. there is a Common law framework in place, which offers more adequate protection to the minority shareholders but still is a fertile ground for high information asymmetries between managers and the market. Therefore, since higher information asymmetries exist, a much stronger signalling effect compared to the remaining Continental Europe countries should also exist. This

is also due to the high liquidity that characterizes the U.K. market as well as the low levels of ownership concentration of a corporation, which can result to higher market reactions to repurchase announcements.

Furthermore, La Porta et al. (2000) argue that in common law countries that have a higher level of investor protection such as the U.K., since shareholders feel protected they would accept lower payouts and higher reinvestment rates for high growth firms. The opposite should apply for low growth firms, where shareholders would demand a higher payout. Thus, in countries with strong investor protection, high growth companies should have significantly lower payouts than low growth companies (La Porta et al., 2000). In contrast, in countries with low investor protection, it is not expected for such a relationship to hold, since investors might try to acquire a higher payout and as quickly as possible.

On the other hand, the converse should apply in the remaining Continental Europe countries such as France and Germany, which are bank-based markets and therefore have lower information asymmetries. This is due to the civil law framework that is in place, the relatively smaller degree of liquidity and the higher level of ownership concentration, which result to less pressure from minority shareholders to the corporation for making a payout. Additionally, as reported by La Porta et al. (1999), civil law countries are characterised by high ownership concentration. Moreover, La Porta et al. (2000) argue that the high ownership concentration accounts as complementary to low investor protection. Since civil law countries have high ownership concentration, meaning there is a lower level of minority shareholders, this leads to less pressure on managers, from the agency costs aspect, and to a lower degree of information asymmetries between management and the market.

It should be noted though, that La Porta et al. (2000) investigate the effect that legal protection has on corporations' payouts in the form of dividends solely. In line with La Porta et al. (2000) are the findings of Bartram et al. (2009) where the authors report that shareholder protection differs significantly between countries. In addition, the authors find that even within a country, the agency costs across firms vary significantly as well. They report that in countries with poor shareholder protection, agency costs and potential growth opportunities have a lesser impact on determining corporate payout policies. Thus, it is clear from these arguments, that the various regulatory frameworks and different levels of ownership concentration can have a

direct and significant effect to corporations' payouts and more specifically to open market share repurchases.

In sum, there is a number of theories that investigate and try to interpret and explain the motives of undertaking a share repurchase programme as well as the market's reaction to share repurchases announcements. This thesis undertakes the task to address these theories and hypotheses, and tests each theory in varying markets that operate under different regulatory, tax and cultural frameworks.

1.3. Main Findings and Contribution

The existing literature provides mixed evidence on the impact and extent of each of the prominent hypotheses on the decision to announce an open market share repurchase, the respective market reaction on such announcements, and the actual implementation of the announced share repurchase programme. The overwhelming majority of the literature focuses on the U.S. market (see Allen and Michaely, 2003 for a review). Hence, one of the motivations for this thesis is the scarcity of studies in markets other than the U.S., especially in Europe. Moreover, the existing research studies provide a single-country analysis, where share repurchases receive the same treatment. Hence, it is difficult to distinguish and extract the contending hypotheses that underlie share repurchases, under varying regulatory frameworks and institutional, as well as cultural settings.

This thesis aims to overcome these obstacles by analysing and evaluating the payout mechanism of open market share repurchases and the market reaction to such announcements, using a comprehensive sample of firms across a number of European countries that are characterised with a wide heterogeneity in terms of their regulatory and institutional settings. Additionally, this cross country analysis, where firms have different levels of ownership concentration and with different types of majority shareholders (i.e. managers, family owners and institutional investors), allows me to thoroughly investigate the influence that the overall ownership concentration can have on open market share repurchases and the respective market reaction.

The sample includes three main European countries: United Kingdom, France and Germany. These countries are the three largest economies in Europe and have significantly different characteristics of tax, regulatory and institutional frameworks. I hand collect the data from news announcements made by firms that are primarily

listed in one of the three markets under investigation. The data is in text format as reported in *Factiva* and *Perfect Analysis* databases, which contain all the publicly available news reports. In addition, I require the sample of firms to have their accounting data and historical share prices listed in *Worldscope*. I identify 970 announcements of intention to initiate an open market share repurchase programme during the ten year period 1997 to 2006, of which 513 took place in the United Kingdom, 263 in France and 194 in Germany. Primarily, the sample shows that the majority of the share repurchase announcements took place in the United Kingdom which is in line with the existing literature (Lasfer, 2005; Rau and Vermaelen, 2002). Rau and Vermaelen, 2002 argue that the reason for this is that open market share repurchases were illegal until recently in many European countries such as France and Germany. Furthermore, the authors argue that due to the fact that share repurchases do not fit the corporate culture in Europe, it is only recently that the respective European markets are starting to use share repurchases as a payout mechanism ever more often. The issues that are investigated in this thesis are as follows.

Initially, I analyse the extent of the impact that each of the prominent hypotheses concerning share repurchases have on a firm's decision to publicly announce its intention to repurchase its shares in the open market. For achieving this, I employ the initial sample of 970 repurchase announcements that took place in the three European countries under investigation (United Kingdom, France and Germany) during 1997 to 2006. Following Mitchell and Dharmawan (2007) I employ a standard logit modelling methodology in order to evaluate and identify the motives that drive managers to announce their intention to undertake an open market share repurchase programme. Moreover, I construct a likelihood model that identifies with a high degree of success the proportion of firms that have actually made a share repurchase announcement and those that have not. For a thorough robustness check, four different matching methods for the construction of the control samples and a boot-strap methodology are applied.

Furthermore, I perform an empirical investigation of the market reaction on the announcement of intention to repurchase shares in the open market. In order to do so, a standard event methodology proposed by Brown and Warner (1985) is applied. Hence, I am able to estimate and analyse the excess and cumulative excess returns at the time before, during and after the announcement of the open market share repurchase. In addition, unlike previous studies, I examine if there is a significantly different market reaction towards the initial and the subsequent share repurchase

announcements. This enables me to analyse if the information conveyed to the market has the same impact on the initial as on the subsequent announcements, or if the market becomes accustomed to subsequent announcements, hence having a smaller reaction. I then perform an in-depth cross-sectional analysis in each of the three markets individually, in order to identify which are the firm specific characteristics that have a significant impact on the market reaction to open market share repurchase announcements. In addition, this allows me to analyse if the firm specific characteristics have a uniform effect on the market reaction throughout the different countries, or if their impact varies in each market under consideration. I also analyse the impact that changes in taxation and regulations can have on the respective market reaction to open market share repurchase announcements.

Lastly, I investigate the actual share repurchase trades that took place in the open market and the completion rates of the announced share repurchase programmes. For achieving this, I focus only on the U.K. market. The reason for this is twofold. First, is the lack of data availability for collecting and identifying the actual share repurchase trades in France and Germany, that would allow me to perform a cross-country analysis. Second, the overwhelming majority of the open market share repurchases that took place in France and Germany targeted the maximum proportion of the common shares outstanding that were allowed to do so by the existing regulations. Nevertheless, I identify 196 announcements of intention to repurchase shares that took place in the United Kingdom during the ten year period 1997 to 2006. I require all the firms in this sample to have stated in their announcement either the proportion of the common shares outstanding that they were willing to repurchase, or the total cash value that they were willing to utilise for the repurchase programme. Furthermore, I analyse if managers trade strategically and display market timing abilities or they repurchase for providing price support. In addition I perform a rigorous examination on the impact that the announcement, as well as each and every stage throughout the implementation of the open market share repurchases, can have on firm risk. Furthermore, I perform a thorough firm risk analysis, by breaking down a firm's total risk, to its two main components of systematic and idiosyncratic risk. I perform this risk decomposition analysis for robustness check, so that I can assess the impact that share repurchases have on both components of a firm's risk, and hence understanding whether it is only the systematic risk that changes, or the firm total risk as well.

The main empirical findings of this thesis are the following. First, I find that not all the factors and firm specific characteristics have a significant impact consistently throughout the varying markets on the managerial incentive to announce an open market share repurchase programme. I find that in all three countries, firms that are large, have low leverage, and are widely held, are more likely to announce their intention to repurchase their shares in the open market. Further, I find only in the U.K. that a firms' low growth with high excess cash levels, can have a significant impact on the likelihood of announcing an open market share repurchase programme. In addition, I find some evidence in France and Germany, that a firm's potential undervaluation has a significant impact on the decision to announce a share repurchase. Finally, I find for all three countries that the dividend pay out has a positive relationship with the propensity to announce a share repurchase, hence supporting the hypothesis that share repurchases are viewed by managers as complements rather than substitutes to dividends.

Second, I find that the market displays a significant reaction to the announcement of intention to repurchase shares in the open market, which varies significantly among countries. Nevertheless, the abnormal market reaction is significantly lower than the average abnormal market reaction reported in U.S. studies. Moreover, I do not find strong evidence of the undervaluation hypothesis as having the ability to explain the markets' excess reaction to share repurchase announcements. Further, I find a significantly higher market reaction to the initial announcement compared to the subsequent announcements, suggesting that the first announcement sends a stronger signal to the market that the firm's stock price is undervalued, whereas the subsequent announcements convey less information. The empirical results from the cross-sectional analysis show firm size and past share price performance have a significant and inverse effect on the market reaction. Moreover, I find evidence that it is only in the United Kingdom that regulatory and tax changes have a significant impact on the market reaction to share repurchase announcements.

Third, I find that firms repurchase on average 74% of the shares targeted at the time of the announcement. In addition, the evidence shows that managers are willing to pay a higher price for repurchasing shares compared to prior non-repurchasing days, hence suggesting that managers repurchase shares in order to provide price support. Moreover, I do not find evidence that firm risk changes after the announcement of a share repurchase. Nevertheless, I find that firm risk is significantly

reduced during the period when the actual repurchase trades are taking place, and that repurchasing firms have significantly higher risk compared to their industry peers of similar size or similar valuation proxied by their market-to-book ratio. Finally, the results from the risk decomposition confirm the findings on risk change during the actual repurchase trades.

In summary, the contribution of this thesis to the existing literature is ample. This thesis explores the gaps in the main contending hypotheses that underlie the open market share repurchases. It reflects the level of homogeneity across the European countries under investigation and shows that changes in taxation and regulations can have a significant impact on open market share repurchases. Furthermore, this thesis provides a thorough examination of the signalling of undervaluation hypothesis, and reveals the institutional and firm specific characteristics that impact the market reaction to share repurchase announcements.

Furthermore, a significant contribution of this thesis is the identification of the determinants that drive managers to publicly announce their intention to undertake an open market share repurchase programme. Additionally, it establishes that in different countries, the managerial motives differ significantly and have a varying impact on the decision to announce a share repurchase programme. What is more, it provides a number of models that have the ability to predict with a fairly high degree of certainty and robustness, the likelihood for a firm to announce its intention to repurchase its shares in the open market.

This thesis, in addition, provides an insightful investigation inside the "black box" of the completion rates of the announced open market share repurchase programmes and their respective actual repurchase trades. What is more, it analyses and answers the question if managers repurchase strategically and time the repurchase trades or if they repurchase in order to provide price support to the firm's share price. Further, this thesis contributes to the trifling literature on share repurchases and risk[3], by providing a broad and clear picture of the behaviour and interaction of firm risk in respect to all stages of open market share repurchases, from the time period prior to the announcement, to their initiation, implementation, and to the short term period

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[3] To the best of my knowledge, only Dann et al. (1991), Hertzel and Jain (1991) and Dennis and Kadlec (1994) study the impact of the announcement of fixed price tender offer share repurchases on firm risk. Whereas it is only Bartov (1991) and Grullon and Michaely (2004) that study the impact of the announcement of open market share repurchases on firm risk. It is also notable, that all four of these research studies focus on the U.S. market.

after its completion. Hence, it establishes if there is any risk related information that is conveyed to the market through open market share repurchases.

Moreover, this thesis examines and incorporates the substitutability of dividends and the interaction and effect that regular dividends have on share repurchases in general, from both the shareholders' and managerial point of view. Finally, this thesis contributes to the literature by providing fresh evidence from the European markets, which can also be comparable to previous U.S. and international evidence. Hence, this thesis sheds more light on the relatively unexplored area of open market share repurchases and establishes, with the comparability of its findings to the U.S. results, if the emerging patterns on security returns are not the result of data mining, as argued by Fama and French (1998).

The remainder of this thesis is organised as follows. Chapter 2 analyses and identifies the determinants and managerial incentives for announcing an open market share repurchase programme. Chapter 3 investigates the market reaction to the announcement of open market share repurchases. Chapter 4 examines the completion rates of the announced open market share repurchase programmes and the respective actual repurchase trades. In addition, it evaluates the relationship and interaction between firm risk and all the stages of open market share repurchases, from the time before the announcement, to its implementation, and the period after its completion. The summary and conclusions of this thesis are discussed in Chapter 5, along with the limitations this thesis, and ideas for potential future research.

Chapter 2.
2. The Determinants of Share Repurchases in Europe

In this chapter I employ a logit model methodology in order to identify the determinants of a firm's decision to announce a share repurchase. In the models, I incorporate firm specific financial characteristics and measures of share price performance. Hence, I am able to estimate the probability of open market share repurchase announcements across Europe. The robustness of the proposed models is investigated across different dimensions of sample construction methods and with a boot-strap technique. I find that leverage, size, and ownership concentration, have a significant impact on the announcement of share repurchases in all three countries under study. Finally, I construct a number of models with strong predicting ability of a firm's likelihood to announce a share repurchase.

2.1. Introduction

In this chapter I perform a cross country analysis in order to identify the determinants for announcing open market share repurchase programmes in the United Kingdom, Germany and France. Previous studies have focused predominantly on the analysis and interpretation of the market reaction to share repurchase announcements. Some of the most prevailing theories relate the market reaction on share repurchase announcements to the undervaluation/under-reaction hypotheses. Others focus on the impact of excess cash flow and agency costs, capital restructuring, size and growth of the firm, differential tax advantage and dividend substitution, ownership concentration and management compensation incentive hypotheses[4]. However, the vast majority of these studies are U.S.-based and do not provide a comparative analysis across countries with different institutional settings. Finally, they are not focusing on identifying the managerial incentives for announcing a share repurchase programme.

The purpose of this chapter is to overcome this limitation by assessing what are the management's incentives for announcing an open market share repurchase, by employing a sample of firms across European countries with wide heterogeneity in terms of their institutional settings. This research is also motivated by the dearth of studies in these markets. Thus I choose United Kingdom, France and Germany where I identify 970 share repurchase announcements that took place over the period 1997-2006. An additional reason for selecting these three countries is the fact that we have limited knowledge on which factors have a significant impact on announcing an open market share repurchase in Europe. Furthermore, these countries have significant differences between them in tax, regulatory and institutional frameworks.

In a recent study, Jain et al. (2009) investigate the market reaction to a firm's choice to make a payout to its shareholders, either through dividends or share repurchases in the U.S. They report an average market reaction for dividend initiations of 1.62% and for share repurchases of 1.25% respectively. The difference with their research study is that Jain et al. (2009) investigate the payout decision, and more specifically between the choice to initiate a dividend payment and the choice to initiate a share repurchase for the first time after a firm has performed an initial public offering in the U.S. stock market. Therefore, the authors inevitably investigate only

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[4] For a review, see Vermaelen 2005, Ikenberry at al, 1995; Dittmar, 2000; Jagannathan and Stephens, 2003; Brav et al. 2005; Stephens and Weisbach, 1998; and Ikenberry et al., 2000 in Canada.

those firms that are going from a transitional stage of high growth to a lower growth, since they will already have the ability to cover all of the investment opportunities and still have excess cash that they are willing to payout to their shareholders. An additional drawback of this study is that share repurchases are considered to be perfect substitutes to dividends since the choices are either to pay dividends or to repurchase shares, whereas in this study I investigate the likelihood to announce a share repurchase or to not make such an announcement at all. In addition, since in a number of European countries share repurchases were considered to be illegal practices until recently, with the change in regulations even more mature firms that already were paying dividends had now an alternative payout method in their arsenal.

Furthermore, it has been documented in the current literature that only with the announcement of intention to repurchase shares in the open market there is a significant and positive market reaction of approximately 3.5% in the U.S. (Ikenberry et al. 1995), however the market reaction to such announcements is significantly lower in Europe. For instance, a market reaction of 1.5% and 0.5% is reported in the U.K. (Lasfer, 2005) and in France (Ginglinger and L'Her, 2006) respectively. It is notable though, that this positive market reaction occurs just on the announcement itself suggesting that the market considers this type of announcement to be good news. The paradox with the positive market reaction is that an open market share repurchase announcement is not a commitment to the firm and consequently lacking credibility, since even a bad firm could mimic this announcement. Subsequently, there should not be a positive market reaction. However, Bhattacharya and Dittmar (2003) argue that such an announcement attracts scrutiny and therefore a bad firm would not mimic such an announcement because it would want to avoid the market's scrutiny. Therefore, there should be other reasons that lead to a positive market reaction to open market share repurchase announcements. Therefore, the main purpose of this chapter is to identify what are the principal reasons and their incentives that lead management to make such an announcement and not the propensity to actually repurchase shares, which falls out of the scope of this chapter and is investigated in chapter 4.

There is only a limited number of research studies that explore the managerial incentives for announcing an open market share repurchase, which take place in the Australian market (Mitchell and Dharmawan, 2007) and the U.S. market (Barth and Kasznik, 1999; and Guay and Harford, 2000). Mitchell and Dharmawan (2007) find that the main motives for management announcing a share repurchase are

undervaluation, as captured by the negative share price performance prior to the repurchase announcement, lower ownership concentration, and the excess debt capacity. Additionally, they find some evidence of the free cash flow as having a positive and significant impact on management's decision to announce a share repurchase. Barth and Kasznik (1999) find that intangible assets and idle cash have a positive relationship, whereas information asymmetry has a negative relationship with the propensity to announce a share repurchase. Guay and Harford (2000) find that the announcement market reaction to dividend increases is higher compared to repurchases as well as the fact that cash flow shocks preceding dividend increases are significantly more permanent than cash flow shocks preceding share repurchases.

However, Barth and Kasznik (1999) focus mostly on the relationship between the likelihood to announce an open market share repurchase programme in the U.S. and firms' intangible assets, without accounting for other firm specific characteristics which could influence the decision to announce an open market share repurchase programme. Moreover, Guay and Harford (2000) focus on the permanence of cash flows with respect to the choice of announcing dividend increases and announcing a share repurchase. Therefore, the authors view share repurchases as substitutes to dividends. In addition, the authors consider only dividend increases without taking into account the interaction and effect that the choice to repurchase can have on dividend initiations as well as dividend decreases and omissions.

However, there are some fundamental differences between the existing research studies and this chapter. First it would be difficult to draw from the Australian evidence the same inferences concerning the management's incentives for a share repurchase for other markets. This is due to the existence of crucial differences concerning the repurchase mechanism from the announcement to the actual implementation of the repurchase programme. In detail, share repurchases in Australia must be formally announced, firms must implicitly state the number of shares intended to be bought back, the announced repurchase programme must commence within two months, and the programme must be completed within six months[5] after the announcement.

Moreover, the findings reported in the existing literature are derived from a single country analysis. Therefore, when studying the European markets which have a

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[5] From September 1999 and onwards it was possible for firms to conduct a share repurchase programme for a longer or unlimited duration if noted.

wide heterogeneity in regulatory and institutional frameworks, I argue that there can be significant differences on the managerial incentives for announcing a share repurchase programme. For instance in France, companies have high levels of ownership concentration (La Porta et al., 1999) and for a number of firms a considerable level of ownership belongs to either wealthy families or even to the state (Morck et al., 2005). Further, the majority of the U.K. firms are widely held companies whereas France and Germany have a more concentrated ownership structure, of which France has a higher level of ownership concentration compared to Germany (La Porta et al., 1999). In addition, in Germany, banks can have considerable voting power over a wide range of firms, since shareholders routinely sign over their voting rights to banks that manage their stock accounts (Morck et al., 2005).

Hence, different levels of shareholder protection and especially ownership concentration, will lead to different managerial attitudes towards shareholder value maximisation, and consequently, to different attitudes on firms' cash utilisation and the choice of firm payout decisions. For instance, in France, where firms tend to be family owned, and in Germany, where firms have higher levels of ownership concentration compared to the U.K., share repurchases would most likely be treated unreceptively. Moreover, in a qualitative study, Brounen et al. (2004) find that firms in the U.K. consider shareholder wealth maximisation as one of their most prominent priorities, as opposed to France and Germany where firms tend to put less weight towards realising that goal. What is more, they find that managers in France and Germany consider shareholder wealth maximisation as being less important than optimising firm leverage. In addition, they find that U.K. firms are more shareholder oriented as opposed to French and German firms, where shareholders are less important. Consequently, different managerial attitudes and different levels of ownership concentration are likely to have varying impacts on management's decision to announce a share repurchase.

Therefore, by performing a cross country analysis where firms have different levels of ownership concentration and with different types of majority shareholders (i.e. managers, family owners and institutional investors) more light can be shed on the influence that the overall ownership concentration can have on management's incentives to announce a share repurchase programme.

In order to identify the extent to which each of the prominent hypotheses will affect a firm's decision to announce a share repurchase, I follow Mitchell and Dharmawan (2007), and apply a standard logit model methodology. I evaluate in a univariate and multivariate dimension, the significance and influence of the undervaluation, excess cash, leverage, agency costs, tax savings incentive and ownership concentration, by using the appropriate proxy variables as suggested by the existing literature.

This enables me to analyse and identify what are the managerial incentives in each country of this study, that have a significant impact on the decision to announce an open market share repurchase programme. In order to achieve this, this chapter covers 970 an open market share repurchase announcements (test-sample) that took place in three European countries (France, Germany and the United Kingdom). Then, I match the test-sample with firms that have not announced an open market share repurchase during the entire ten year period under investigation, by employing a number of matching methods. Further, based on the logit models, I construct a successful likelihood model that predicts the probability of announcing a share repurchase programme. In addition, I check the robustness of the results by employing different sample matching methods and a boot-strap simulation technique. Finally, I evaluate the proportion of firms that are classified by the employed model in the boot-strap simulation, as repurchasing firms and non-repurchasing firms (in- and out-of-sample).

I find that for all three countries, some factors have a consistently significant impact on the announcement of share repurchases. Additionally, I find that size (proxied by the natural logarithm of total assets) and the payment of cash dividends (proxied by the ratios dividend yield, and cash dividend over net income) have a positive and significant impact, and that the ownership concentration (proxied by the percentage of closely held shares to common shares outstanding) has a negative and significant impact on the decision to announce an open market share repurchase. Furthermore, the fact that dividend paying firms are more likely to announce a share repurchase programme, supports the hypothesis that repurchases are complements to dividends rather than substitutes. These findings suggest that in all three countries firms that are large, are widely held, and pay higher cash dividends, are more likely to announce their intention to repurchase their shares in the open market.

Furthermore, I find that some of the factors that could have a significant impact on the decision to repurchase are not significant in all three countries. For instance, it is only in the UK that the proxy variable *DFCF*, which is a dummy variable that takes the value of one for firms with low growth (lower than the median) and high excess cash flows (higher than the median), is positively related to the likelihood of announcing a share repurchase. In addition, I find weak evidence that a firm's undervaluation can have a significant impact on the likelihood of announcing a share repurchase announcement only in France and Germany. Hence, the results suggest that apart from size, the payment of cash dividends, and ownership concentration, the remaining factors do not consistently have a significant impact on management's decision to announce a share repurchase in countries with varying institutional and regulatory settings.

Moreover, I do not find any evidence that the tax advantage of share repurchases over cash dividends, as measured by the dummy variable *DTAX* (which takes the value one when share repurchases are more beneficial from a tax perspective compared to cash dividends, and zero otherwise) has a significant impact on the decision to announce an open market share repurchase. Finally, I construct a number of logit models which have a strong predicting ability, especially for the case of the U.K. and France.

The remaining of this chapter is organised as follows. Section 2.2 discusses the current literature and sets the hypotheses that are to be tested. Section 2.3 presents the data and provides an overview of the descriptive statistics as well as the methodology applied in this research. Section 2.4 discusses the empirical results. The conclusions are in Section 2.5.

2.2. Literature Review & Hypotheses Setting

In this section I discuss the potential motives for a share repurchase that have been developed in the existing literature. Furthermore, I develop and set my hypotheses for each of the contending theories that are tested, in order to identify which are the managerial incentives for announcing a share repurchase. Finally, I discuss the proxy variables that I employ in the study in order to test the hypotheses.

2.2.1. Excess Cash

It has been widely discussed in the literature that when a company's existing capital exceeds its potential investment opportunities, the firm can either retain the excess cash or distribute it back to its shareholders in order to reduce the potential arising agency costs (Easterbrook, 1984; and Jensen, 1986).

Two of the most prominent forms of cash distribution to the existing shareholders, are the open market share repurchases and the payment of cash dividends. One of the main advantages for a firm to distribute its excess cash through a share repurchase is that share repurchase announcements pose no commitment to the firm and there is no expectation that this cash distribution will reoccur in the future, whereas dividend announcements are a commitment to the firm and the market penalises firms that reduce or omit their dividend payment (see Grullon, Michaely, and Swaminathan, 2002; Amihud and Li, 2006; and Allen and Michaely, 2002). Thus share repurchasing can be a more flexible method for a firm's cash distribution to its shareholders.

Grullon and Michaely (2004) report that the reduction in free-cash-flows (as well as the reduction in systematic risk) is the source of the positive market reaction to share repurchase announcements. Guay and Harford (2000) find that in the U.S. market, share repurchases are related to less permanent cash flow shocks, whereas more permanent changes in cash flow are related to dividend increases. Furthermore, Dittmar (2000) and Mitchell and Dharmawan (2007) report evidence that firms are more likely to repurchase their stock when they have high cash flows and low investment opportunities. Although, these two research studies focus on the likelihood of actual repurchases and not on the announcement, they indicate that excess cash flow can be a potential explanation of a firm's likelihood to announce a share repurchase.

Hence, I expect free cash flow, which is captured by the firm's excess cash and low growth opportunities, to increase the propensity to repurchase shares. As a proxy for capturing the excess cash, following Dittmar (2000) I employ the ratio of net operating income before taxes and depreciation to total assets *(CF)* at the year-end prior to the repurchase announcement. Additionally, in order to capture a firm's lack of future growth opportunities, in the spirit of Myers (1977) and Mitchell and

Dharmawan (2007), I use the market-to-book ratio *(MKBK)*, which is defined as the book value relative to the market value of equity.

As an alternative measurement of a firm's free cash flow that will also capture a firm's future growth opportunities, following Opler and Titman (1993) I construct a dummy variable *(DFCF)* that takes the value of one for firms that have simultaneously low Tobin's *q* (lower than the median *q* of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise.

Furthermore, as argued in the literature (e.g. Opler and Titman, 1993; Mitchell and Dharmawan, 2007) in order to have a direct measure of free cash flow I combine the cash flow *(CF)* proxy variable with the ratio proxy variable *MKBK*, into one interaction variable *(FCF)*. As argued in Bagwell and Shoven (1988), Nohel and Tarhan (1998) and Mitchell and Dharmawan (2007), the interaction variable is a more appropriate measure for capturing a firm's level of free cash flow for each firm. Therefore, I replicate the logit models with the interaction variable *FCF* instead of *CF*, and I find no significant change in the results.

2.2.2. Excess Debt Capacity

When a firm distributes its excess capital to its shareholders trough a share repurchase then it reduces its equity capital. This in turn increases its leverage ratio. Therefore, a share repurchase reflects the management's preference to use debt instead of equity in order to move closer to an optimal leverage ratio (Bagwell and Shoven, 1988; and Hovakimian et. al., 2001). Previous studies report evidence that companies are more likely to repurchase stock if their respective leverage ratios are below their targets (Mitchell and Dharmawan, 2007; and Dittmar, 2000). In addition, Hovakimian et al. (2001) report that more profitable firms have on average lower leverage ratios and are more likely to repurchase stock instead of retiring debt. Jagannathan and Stephens (2003) further report, that firms which repurchase their own shares most frequently, appear to have the lowest debt ratios. These findings support the notion that firms are more likely to repurchase stock when they have excess debt capacity, consequently being motivated to move towards their target leverage ratio.

Therefore, I expect to find that the decision to announce a share repurchase will be motivated by the firm's current leverage ratio and that the respective leverage

ratios should be lower for the firms that announce a share repurchase compared to firms that do not make such an announcement. Thus I expect to find a negative relationship between a firm's leverage and its likelihood to announce a share repurchase. Following Dittmar (2000) and Grullon and Michaely (2002) I use as a proxy for a firm's leverage ratio its total debt divided by its total assets (*LVG*).

2.2.3. Agency Costs

As argued by Shleifer and Vishny (1997), agency costs are incurred between the controlling and the minority shareholders. The higher the ownership concentration, the less it is possible for minority shareholders to influence the firm's decision making. Therefore, controlling shareholders can wreak substantial costs to other shareholders by redistributing the firm's wealth. Consequently, the lower the ownership concentration the more it is possible for the minority shareholders to influence a firm's decision making on the excess cash utilization.

On the other hand, Stulz (1988) argues that fixed price share repurchases can be used in order to consolidate voting power in the hands of management. Nevertheless, this can be beneficial to shareholders since they could force bidders to pay a higher premium for tendering their shares. In addition, Peyer and Vermaelen (2005) argue that when the management owns a large proportion of the company's shares, then in the case of a share repurchase they will be paying essentially with their own money. Therefore, in the case of privately negotiated share repurchases there must be other motives than the reduction of potential agency costs that can have a significant impact on the decision to repurchase.

Jensen and Meckling (1976) argue that if the costs are lower than the benefits from reducing the respective agency costs, then it could be for the management's benefit to repurchase shares in the market and reduce ownership dispersion. Companies with low ownership concentration can have potentially high agency costs and therefore have more incentives to undergo a share repurchase programme, since a share repurchase can be a self imposed control mechanism to management. Further, shareholders can achieve protection from management's self interest behaviour either through the firm's reflected price in the equity market or through the level of management's compensation. Thus, managers should be motivated to minimize the respective agency costs (Mitchell and Dharmawan, 2007). Furthermore, Mitchell and

Dharmawan (2007) find that the managerial incentive for a share repurchase in Australia is inversely related to a firm's level of ownership concentration.

In addition, Fenn and Liang (2001) find a positive relationship between management stock options and share repurchases, suggesting that share repurchases are used for reducing potential agency costs. But this is contradictory to Jagannathan and Stephens (2003) who report that firms that repurchase most frequently have the lowest level of managerial ownership, which supports Shleifer and Vishny (1997) who argue that the lower the ownership concentration level, the less it is possible for shareholders to influence managers on undertaking a share repurchase. Moreover, Bartram et al. (2009) find in the U.S. market that the lower the ownership concentration, the higher the payouts (both dividend increases and share repurchases) that firms make. Consequently, different levels of protection and ownership concentration can lead to differences in information asymmetry and the market's perception which are reflected on the timely update of stock prices, with new firm specific information, such as share purchase announcements.

It should be noted though, that there is a difference between managerial (insider) ownership and block holder (outsider) ownership, since these two groups might have conflicting interests. Jagannathan and Stephens (2003) find evidence that firms that have high levels of institutional ownership and low levels of managerial ownership are the ones which tend to repurchase more frequently, suggesting that infrequent repurchasers are more likely to have higher levels of information asymmetry[6]. In addition, De Cesari et al. (2009) find that a firm's tendency to time the share repurchases is positively related to institutional ownership for firms where the level of institutional ownership is low, whereas it is negatively related to institutional ownership for firms where the existing level of institutional ownership is high. Moreover, the authors find that insider ownership is inversely related to a firm's tendency to time share repurchases.

Nevertheless, Jagannathan and Stephens (2003) and De Cesari et al. (2009) are studying the frequency and the timing of actual repurchases respectively, not the announcement of intention, and they are only distinguishing between managerial and institutional shareholders, without taking into account other outsider block holders

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[6] However, Jagannathan and Stephens (2003) suggest that the interpretation of this finding should be done with caution since both the institutional ownership and repurchase frequency increase over their sample period.

that could be influential on the decision to announce a share repurchase programme. Furthermore, Oswald and Young (2008) investigate the impact that insider ownership and external shareholder monitoring have on the distribution of excess cash in the U.K. They report evidence suggesting that firms which have scarce investment opportunities and the risk of overinvesting is high, both the level of insider ownership and external monitoring have an incrementally significant positive relationship with share repurchases. In addition, the authors conclude that a better insider incentive alignment with shareholders' incentives is an important factor on initiating payouts such as share repurchases. However, Oswald and Young (2008) investigate the impact that agency costs have on actual share repurchases and not on the announcement of intention to repurchase shares, which this chapter investigates.

Moreover, Ginglinger and L'Her (2006) report that widely held firms experience a more favourable market reaction on the announcement of a share repurchase compared to family controlled firms, as well as the fact that the identity of a firm's shareholders affects the market reaction to share repurchase announcements. They find that since a share repurchase programme may enhance shareholder concentration and because the market takes into account any negative or positive effects of possible increase in ownership concentration, thus family controlled firms react more negatively.

Nonetheless, these findings are derived from a single-country analysis which is taking place in the French market, where companies have high levels of ownership concentration (La Porta et al., 1999), and for a number of firms a considerable level of ownership belongs to either wealthy families or even to the state (Morck et al., 2005). The majority of the U.K. firms are widely held companies whereas France and Germany have a more concentrated ownership structure, of which France has a higher level of ownership concentration than Germany (La Porta et al., 1999). This is also supported by Faccio and Lang (2002), who report that there are significant differences in the ownership patterns between the UK and Germany and France. They report that widely held firms comprise 63.8% of the UK firms. In contrast, they report that France and Germany are among the countries with lowest proportions of widely held firms (14% and 10.37% respectively). Moreover, they find that firms in France and Germany are mostly family owned companies (approximately 65% in each country), whereas in the U.K., family controlled firms comprise only approximately 24% of the

firms. Finally, Faccio and Lang (2002), find that large firms are less likely to be family owned.

In addition, banks in Germany can have a considerable voting power over a wide range of firms, since shareholders routinely sign over their voting rights to banks that manage their stock accounts (Morck et al., 2005). Therefore, I argue that under different institutional settings, the influence that ownership concentration can have on the incentive to announce a share repurchase can vary significantly.

I expect to find that repurchasing firms with lower levels of ownership concentration and therefore are more likely to experience potential agency costs, should be more prone to utilise share repurchases as a payout method in order to reduce the arising agency conflicts. As discriminatory variable with the potential of influencing the likelihood of an open market share repurchase announcement, I follow Mitchell and Dharmawan (2007) and Bartram et al. (2009), and use the percentage of closely held shares[7] divided by the number of total common shares outstanding (*OWN CON*). However, this proxy has its limitations. First this proxy excludes the options due in sixty days, shares in form of convertibles and shares held in fiduciary capacity or by insurance companies, which could dilute the findings on ownership concentration. Second, this proxy does not distinguish between the types of the majority shareholders (i.e. insiders and outsiders) of the firm. Nevertheless, I argue that the percentage of closely held shares relative to the common shares outstanding can still be a good indication for the impact that the concentration of firm ownership can have on payout decisions such as share repurchases. I expect to find a negative coefficient suggesting that the lower overall level of ownership concentration, the higher will be the probability for the announcement of a share repurchase, in order to reduce the potential agency costs.

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[7]The variable Closely Held Shares is taken from Worldscope database, and represents the following: Shares held by insiders; Shares held by officers, directors and their immediate families; Shares held in trust; Shares of the company held by any other corporation (except shares held in a fiduciary capacity by banks or other financial institutions); Shares held by pension/benefit plans; Shares held by individuals who hold 5% or more of the outstanding shares. It excludes: Shares under option exercisable within sixty days; Shares held in a fiduciary capacity; Shares held by insurance companies; Preferred stock or debentures that are convertible into common shares.

2.2.4. Firm Size

According to Vermaelen (1981) small firms are more likely to have higher information asymmetries, since they have less coverage by analysts and the media. Therefore, small firms are more likely to be misvalued which in turn increases the likelihood to repurchase their shares. Further, Mitchell and Dharmawan (2007) find that smaller companies (in the Australian market) and especially those that announce a large fraction (6% or greater) of the outstanding shares to be repurchased, have a high signalling impact due to information asymmetry.

Further, a number of research studies in the U.S. market (Dittmar, 2000; Grullon and Michaely, 2002; Ikenberry et al., 1995) report that large firms are more likely to undertake a share repurchase, as well as the fact that size is positively related to the volume of share repurchases. This suggests that large firms are also trying to take advantage of possible undervaluation. Thus, firm size can be a significant firm characteristic which can influence the propensity of a share repurchase announcement.

I expect to find that larger and more mature companies, which are more likely to have less available investment opportunities for future growth, should have a higher propensity to distribute the excess cash back to the shareholders via a share repurchase programme, in order to reduce any potential agency costs. Following Dittmar (2000), Grullon and Michaely (2002), and Jagannathan and Stephens (2003), I proxy for size (*SIZE*) with the natural logarithm of a firm's total assets at the year end prior to the share repurchase announcement. In addition, following Rau and Vermaelen (2002), I replicate the models by using as a size proxy the natural logarithm of the total value of a firm's market capitalization at the year-end prior to the share repurchase announcement and find no significant change on the results.

2.2.5. Personal taxation and dividend substitution

An additional factor with the ability to influence the decision to repurchase, is the tax differential between capital gains and personal income tax. Typically, share repurchases are taxed as capital gains. Consequently, when capital gains are taxed lower than personal income, share repurchases can be more beneficial to investors. According to the personal tax savings hypothesis, share repurchases can be more tax efficient and can be more valuable (from a tax perspective) for shareholders than a dividend payout (Grullon and Michaely, 2002).

Nevertheless, the findings reported in the existing literature on the impact of tax on share repurchases are mixed. For example, Bagwell and Shoven (1989) and Dittmar (2000), find no evidence that the tax regulations can have a significant effect on payout policies. In contrast, a number of research studies (e.g. Masulis, 1980; Grullon and Michaely, 2002; Lie and Lie, 1999; Rau and Vermaelen, 2002; and Lasfer, 2005) report evidence that taxation is an important driver on firms' payout decision making and when more favourable measures are taken towards share repurchases, then share repurchase announcements and share repurchasing activity, as well as the market reaction to the announcement of a share repurchase, increase. When a firm announces its intention to repurchase its shares, the firm experiences a positive announcement return. McNally (1999), agues that the announcement returns reflect the increase of the firm's after-tax value, which is associated with the implied change in distribution policy, and the higher the investors' average tax rate, the greater is the increase in the after-tax value.

Moreover, Kooli and L'Her (2010) report evidence from Canada that tax has a significant impact on a firm's decision to actually repurchase its shares. Moreover, the authors report that after the change in regulations where the rate of capital gains tax became lower than the top marginal rate on dividends tax, the dollar amount distributed by share repurchases relative to dividends increased from 55.02% to 74.29%. Hence, it reflects the effect that the capital gains tax differential relative to income tax can have on the decision to repurchase.

Given the flexibility and tax advantage of open market share repurchases, they can be viewed as substitutes to cash dividends. Another view though, is that firms that pay cash dividends already have the necessary resources in order to implement an open market share repurchase. Therefore, based on the flexibility of open market share repurchases compared to cash dividends, these two payout mechanisms can be viewed as complements rather than substitutes (Jagannathan et al., 2000).

Concerning the substitution hypothesis, the overwhelming majority of the evidence is derived from the U.S. market. DeAngelo et al. (2000) examine the relationship between special dividends and share repurchases, and they find no evidence in support of the substitution hypothesis. Moreover, Jagannathan et al. (2000) find that firms use permanent earnings for the cash dividend pay out, whereas share repurchases are funded from unexpected earnings. This is also supported by Dittmar (2000) where the author reports evidence that firms repurchase shares when

they have excess cash and finds no evidence that repurchases act as substitutes to cash dividends. Finally, Mitchell and Dharmawan (2007) in the Australian market, report that dividends do not influence a firm's decision to repurchase. In contrast, Grullon and Michaely (2002) report evidence for the U.S. market that share repurchases are perceived by the market to be substitutes to cash dividends.

Given the conflicting evidence on the dividend substitution hypothesis and the limited research on markets other than the U.S., I hypothesise that the managerial incentive for announcing a share repurchase will be related to the firm's payment of dividends. Hence, for testing if the tax flexibility and benefit of share repurchases has a significant impact on the decision to repurchase, I follow McNally (1999) and I proxy for the average tax rate with the dividend yield ratio *(DIV_Y)*. According to the personal tax savings hypothesis, I expect to find an inverse relationship between the dividend yield and the decision to repurchase. In order to test if share repurchases are viewed as substitutes or complements, following Dittmar (2000) and Jagannathan and Stephens (2003), I use *DIV/NI*, which is the ratio of regular cash dividends divided by the firm's net income as reported in the year end prior to the repurchase announcement. If share repurchases are used as substitutes then I expect to find a negative relationship between the incentive to repurchase and the dividend cash payout *(DIV/NI)*, whereas if they are viewed as complements then I expect to find a positive relationship. Therefore, I employ both proxy variables, because the first can be used for capturing the tax effect, whereas the latter is a direct proxy of a firm's cash payout, and therefore a more direct measure for the dividend substitution hypothesis.

Additionally, in order to capture the effect that a favourable tax differential of capital gains might have on a firm's decision to announce a share repurchase programme, I employ a favourable capital gains differential tax dummy variable *(DTAX)*. *(DTAX)* takes the value of one for every event (both test- and control-firms) that takes place during the time periods where for each of the three countries capital gains were taxed lower than the personal income tax, and zero otherwise. I expect to find a positive relationship between the capital gains differential tax dummy and the decision to announce a share repurchase.

For the U.K., I identify two periods. First, the period prior to April 1st 1998, where the abolishment of the Advance Corporation Tax (ACT) became effective. Prior to the abolishment of ACT an imputation system of taxation was in effect in the

U.K., according to which open market share repurchases were cash distributions for tax advantage purposes, hence creating an ACT charge. Furthermore, in the case where there was no surplus ACT capacity against which the tax liability of share repurchases could be offset share, then open market share repurchases would generate an additional tax liability for shareholders. For instance, prior July 2nd, 1997, tax-exempt shareholders such as pension funds were able to claim back the tax credit on dividends, hence making an 80 pence net dividend worth out of 100 pence. However, the tax credit on share repurchases was not refundable. Therefore, prior to the abolishment of ACT share repurchases were not considered to be an attractive method of payout. Moreover, Rau and Vermaelen (2002), argue that while ACT was effective, investors belonging to high tax brackets would prefer open market share repurchases than cash dividends, whereas investors belonging to low tax bracket would prefer cash dividends over share repurchases. With the abolishment of ACT the tax disadvantage of share repurchases was removed hence, increasing firms' attractiveness to open market share repurchases. Second, the period following February 1st 2005 where a payment made by a company on the purchase of its own shares would be subject to income tax, rather than capital gains tax which were taxed at a lower level than the respective level of income tax. Consequently, the tax benefit of share repurchases for the shareholders would be diminished. Thus, for the time period between April 1st, 1998 and January 31st, 2005 the dummy variable *(DTAX)* is assigned the value of one, and zero otherwise.

In France, before January 1st, 2005 short-term capital gains (gains on sales of securities held for less than two years) were taxed as regular income tax whereas long-term capital gains were taxed at a 19% rate. After January 1st 2005 and until December 31st 2005 long-term capital gains were taxed at a lower rate of 15%. For the period between January 1st 2006 and December 31st 2006 long-term capital gains were taxed even lower at 8%. Therefore, the dummy *(DTAX)* for France takes the value of one for the period after January 1st 2005 and zero otherwise. In Germany, after January 1st 2001, where the Tax Reform 2000 became effective, only 50% for both dividends and capital gains received by individual shareholders would be taxable. Since the marginal personal tax rate was effectively reduced to 48.5% any tax advantage of share repurchasing would be diminished. Hence, the dummy *(DTAX)* for Germany, takes the value of one prior to the period after January 1st 2001 and zero otherwise.

Further, Lie and Lie (1999) find evidence that shareholder tax implications affect how firms distribute cash to their shareholders. In addition they report that managers are more sensitive to the tax threshold of the shareholders if a large fraction of the shares is owned by institutional investors because they can be more capable and willing to inform managers about the tax implications of different cash disbursements.

2.2.6. Information Asymmetry and Undervaluation

Information asymmetry, leads to one of the main motives for a share repurchase that has been largely discussed in the literature which is the undervaluation hypothesis. The undervaluation hypothesis is based on the notion that information asymmetry between the management and the shareholders can lead to a firm's misvaluation. In that case, if managers believe that the current equity price in the market is not reflecting the true price of the firm, then the firm can repurchase its own stock since it believes it is a good opportunity to invest in its own stock due to the current misprice or signal to the market that the firm is undervalued. Therefore, by making such an announcement (assuming that the markets respond efficiently) prices should then adjust instantly to the new price levels that reflect the true value of the firm.

A number of research studies (e.g. Grullon and Ikenberry, 2000; Louis and White, 2007; Vermaelen, 1981; Peyer and Vermaelen, 2005) report evidence suggesting that the market has a much higher positive reaction on the announcement of fixed-price tender offer share repurchases compared to that of an open market share repurchase announcement. Because the firm pays a premium in order to repurchase the tendered shares, it can be translated as a costly signal to the market, thus bearing more credibility, contrary to an open market repurchase announcement, which poses no commitment to the firm, therefore being a less credible signal to the market.

Therefore, firms that wish to signal their undervaluation would be more likely to proceed to a fixed-price tender offer since they are considered to be costly signals, thus making them more credible. But that is not always the case, since the majority of firms that undertake a share repurchase and wish to signal their undervaluation, repurchase their shares in the open market, which poses no commitment to the firm (Grullon and Ikenberry, 2000; Allen and Michaely, 2003). Since open market share repurchases are costless signals, there is a drawback concerning the signalling hypothesis. Because the announcement of an open market share repurchase is a

"costless" signal for a company, meaning that it could be imitated even by a bad firm as there is no commitment to undertake the announced share repurchase programme, therefore share repurchases could not be considered as a credible signal.

On the other hand though, Bhattacharya and Dittmar (2003) argue that an open market repurchase announcement still can be a credible positive signal, because by making such an announcement, the company will attract scrutiny. Consequently, the bad firm cannot mimic the good firm because it would want to avoid any possible scrutiny by the market.

Previous studies show that share prices increase significantly on the announcement of intention to buy back stocks. On average, the announcement price effect of an open market share repurchase is approximately 3%, as reported in a number of U.S. studies, whereas this does not seem to be the case for European markets, for instance Lasfer (2005) reports an excess return of approximately 1.6% in the U.K. and Ginglinger and L'Her (2006) an excess return of 0.57% in France. In addition, the market reaction is positively related to the targeted proportion of shares outstanding to be repurchased (Ikenberry et al., 1995; Grullon and Michaely, 2002). This implies that the larger the proportion of shares sought, the stronger the signal of undervaluation, signifying that the management believes that the current share price is a better investing opportunity for the firm. Moreover, Ikenberry et al. (1995), Comment and Jarrell (1991) and Vermaelen (1981) report a similar in magnitude decrease in the share price, during the month prior to the announcement of intention to repurchase, signifying that signalling for undervaluation can be a strong motive for announcing a share repurchase.

Further, Stephens and Weisbach (1998) report evidence derived from the U.S. market that firms repurchase either a substantial fraction of the announced shares or almost none at all. Bhattacharya and Dittmar (2003) argue that firms make the announcement but not repurchase because the signal has already worked (meaning that the firm has already attracted the wanted scrutiny from the market). Moreover, the authors argue that the more a firm is undervalued, or ignored by the market, the greater the scrutiny will be, and therefore the greater the trading profits will accrue by discovering this information about the firm.

In the predominantly U.S. literature (e.g. Stephens and Weisbach, 1998; Ikenberry et al., 1995; Jagannathan and Stephens, 2003; Dittmar, 2000; and Mitchell and Dharmawan, 2007 in Australia) negative abnormal returns are reported during the

period preceding the announcement of a share repurchase programme, indicating that firms announce their intention to repurchase in order to signal to the market that their current stock price is undervalued. It is notable though, that this might not be the case for the European markets. Lasfer (2005) reports that in the U.K. for the period of -151 to -3 days prior to the announcement of a share repurchase, firms show a slightly negative performance, although not statistically significant, whereas for Continental Europe the respective abnormal performance for the same time window appears to be highly negative (-4.56%) and statistically significant. This signifies that the weight of undervaluation as being a motive for announcing a share repurchase programme, can vary among different markets. This is reinforced by the notion that U.S. firms are more widely held compared to the U.K. firms, and even more so compared to Germany and France as discussed earlier, implying that there should be lower levels of information asymmetries in Europe, which is translated to the fact that there should be a lower impact of undervaluation in this study.

Moreover, Ginglinger and L'Her (2006) argue that even if the initial purpose a share repurchase announcement is not to indicate a firm's undervaluation, the managers' timing for the announcement of a share repurchase programme should be triggered by negative abnormal returns during the period preceding the announcement. In addition, the authors report that the average daily abnormal return, during the six months prior to the announcement, is inversely related to the market reaction to the announcement of a share repurchase programme.

Therefore, I expect to find that the greater the undervaluation of a firm, the greater will be the propensity to announce a share repurchase programme. As reported in the literature (e.g. Ikenberry et al., 1995; Jagannathan and Stephens, 2003; Dittmar, 2000; Mitchell and Dharmawan, 2007) a reduction in stock price performance is almost entirely concentrated in the year prior to the share repurchase announcement suggesting undervaluation. In order to capture any potential undervaluation I use as a proxy (*RET_1yr*), which is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days).

In addition, I replicate the logit models by estimating the market adjusted returns in a smaller time horizon. I do this in order to identify if it is a longer or a shorter term undervaluation that can have a significant impact on the decision to announce a share repurchase, as well as if managers have a timing ability on announcing a share repurchase. The smaller time periods employed are -151 to -2 days *(RET_6m)*, -40 to

-2 days *(RET_2m)* and -20 to -2 days *(RET_20d)* prior to the announcement of intention to repurchase. In any case the results remain unaltered.

Apart from the stock returns prior to a share repurchase announcement, an additional indication of a firm being undervalued is the market-to-book ratio. Ikenberry et al., (1995) and Ikenberry et al., (2000) show that firms with high book-to-market ratios earn significant abnormal returns in the subsequent periods, thus suggesting that these firms were potentially undervalued. Further, Dittmar (2000) reports that firms which repurchase stock show an inverse relationship between the dollar amount of repurchased shares and the respective market-to-book ratio suggesting that firms repurchase their stock in order to take advantage of their undervaluation. In addition, Barth and Kasznik (1999), test if undervaluation has a significant impact on the decision to announce an open market share repurchase in the U.S., and employ as a proxy the ratio of market-to-book value of equity.

Thus, I include as a proxy for potential undervaluation the market-to-book ratio *(MKBK)* which is the company's market value compared to its book value of equity at the year end prior to share repurchase announcement. A negative coefficient should suggest that the lower the market-to-book ratio the higher the propensity will be to announce a share repurchase programme in order to exploit a potential undervaluation.

2.2.7. Alternative Motives

An additional reason why firms repurchase their shares is to offset the costs involved of issuing stock options to their employees as compensation. Due to the fact that the issuance of stock options and their respective exercise has a dilutive effect on a firm's earning per share, firms repurchase their shares for countering the options' dilutive effect and keep the number of shares outstanding at the desirable level. Furthermore, Dittmar (2008) argues that when the share options compensation programmes involve executives, as this is often the case, managers have an additional incentive for repurchasing instead of paying dividends which have a tax disadvantage over repurchases and because share options are typically not entitled to dividends.

A number of studies in the literature find evidence that firms that use stock options show a higher propensity to repurchase their shares than pay dividends. Bartov et al. (1998), Jolls (1998), and Weisbenner (1998) employ a discrete-choice methodology for analysing the impact of employee or management stock option on

firms' payout choice between dividends and share repurchases. All three studies report evidence suggesting that stock options have a positive relationship with the probability to repurchase shares. Furthermore, Fenn and Liang (2001) investigate the impact of stock options on a firms' choice to repurchase or pay dividends but also on its total payout policy as a whole. The authors report evidence of a negative relationship between stock options and the payment of dividends, whereas share repurchases have a positive relationship with stock options suggesting that stock options and their increasing use as a compensation policy could be one of the reasons of explaining the increasing trend of share repurchases at the expense of dividends. Furthermore, Dittmar (2000) finds evidence of stock options having a significant impact on firms repurchasing their shares. Contrary to these findings, Brav et al. (2005) find no evidence on their qualitative study (only 10.6% of the interviewed managers agreed) that firms repurchase their shares instead of paying dividends because employee stock options are dividend-protected.

The aforementioned studies focus on the impact of stock options on the actual share repurchases and not on firms' announcement of their intention to repurchase shares. Babenko (2009) investigates the impact of stock options on the announcement of share repurchases against a dividend increase. The author finds that the payout method chosen by a firm is indeed affected by the firms' compensation structure and that share repurchases are more likely to be announced when employees hold more unvested stock and even more so when these firms have a higher need for human capital. However, due to the difficulty of finding accurate data on stock options and more specifically for the two stock option categories of those held by employees and those held by executives which consequently reflects different interests and incentives alignment between these two groups and due to the fact that the impact of stock options should be reflected more on the actual share repurchase trades rather than the announcement itself which is not a commitment to firms, the investigation of stock options falls out of the scope of this research.

An additional motive for share repurchases is the takeover deterrent hypothesis, according to which in the presence of an upward-sloping supply curve for shares, a potential target firm can increase the bid price and consequently the cost of the acquisition by repurchasing its shares. Share repurchases increase a firm's share price in this case because they provide the demand for the firm's shares which increase the lowest price for which the stock is available (Bagwell, 1992; Dittmar, 2000).

Furthermore, Dittmar (2000) finds evidence that a potential takeover has a positive and significant effect on firms actually repurchasing their shares during time periods of takeover waves. However, if a firm wishes to prevent a hostile takeover it would prefer to undertake a fixed price tender offer or a Dutch auction repurchase share repurchase, which gives it the ability to retire a large number of shares in a short period of time and in a pre-specified price range, thus making it a more efficient takeover deterrent mechanism (Bagwell, 1991; 1992). Therefore, the examination of the takeover deterrent hypothesis influencing the managerial incentives for announcing an open market share repurchase falls out of the scope of this research. Furthermore, it should be noted that the motives for announcing an open market share repurchase programme investigated in this research represent only a number of potential factors that lead firms to make such an announcement, a caveat which one should bear in mind when interpreting the results regarding the managerial incentives for announcement the intention to repurchase shares in the open market reported in this research.

2.3. Data and Methodology

2.3.1. Descriptive Statistics

The sample of repurchasing firms is constructed by identifying all the announcements of intention to repurchase ordinary shares in the open market. The data is collected by using news articles posted in *Perfect Analysis* and *Factiva* databases from 1st of January 1997 through 31st of December 2006. The reason for selecting this time period is because it was not until 1998 that share repurchasing was allowed to take place more freely in both Germany and France, thus allowing me to do the cross country analysis between the three different markets.

These databases report any news announcements that were available in the press made by U.K. and European corporations on share repurchases. The sample is refined so as to involve solely firms that announce their intention to repurchase ordinary shares in the open market, thus excluding announcements concerning the repurchase of B-shares or preference shares. Additionally I control my sample for American Depositary Receipts (ADRs) and cross-country listings. Moreover, financial firms, property companies and investment trusts are excluded from the sample. Such exclusion is common practice in the literature (e.g, Shleifer and Vishny, 1997; Fama

and French, 1992). This is due to the fact that financial firms exhibit different capital structures compared to non-financial firms and, especially, they have increased levels of leverage (Saunders and Cornett, 2008). Finally, corporations included in the sample are required to have their share prices listed on *DataStream* and their accounting data on *Worldscope*. The sample contains 970 announcements of intention to repurchase from corporations primarily listed in the United Kingdom (513 announcements), France (263 announcements) and Germany (194 announcements).

After collecting the sample of firms that have announced an open market share repurchase (test-sample), I proceed to the construction of the control firms sample. In order to construct the control sample of non-repurchasing firms, I collect data on all domestic companies that were trading in the respective main markets of each of the three countries under study, that have not announced a share repurchase announcement during the ten year period 1997 to 2006.

The approach I use for matching the repurchasing firms with the non-repurchasing firms is standard in the literature. For every year in the study I randomly generate a sample of firms from the population of firms that have not announced a share repurchase, which I refer to as the "control" group. Each control firm is selected randomly following a uniform distribution and only once from the pool of companies that have not announced a share repurchase programme for the ten year period under study[8]. As argued in Hasbrouck (1985), *"the use of a non-industry matched control sample will render indistinguishable firm- and industry-specific effects, while the use of an industry-matched sample will purge from the analysis any industry-specific effects"*. Therefore, following Hasbrouck (1985), Jagannathan and Stephens (2003), and Mitchell and Dharmawan (2007) I employ an industry-matching procedure and

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[8] The matching method of test and control firms (i.e. repurchasing and non-repurchasing firms respectively) is common in the literature (e.g. Hasbrouck, 1984; Jagannathan and Stephens, 2003; Mitchell and Dharmawan, 2007; etc.). The primary reason for following this procedure is that choice based sample provides higher information content than a random sample (Cosslett, 1981). Given that the number of firms announcing their intention to repurchase their shares in the open market is relatively small compared to non-repurchasing firms, random sampling will consequently result in a sample comprising of a substantially large sample of non-repurchasing firms and only a few firms that made open market share repurchase announcements. Palepu (1986) argues that this would prove to be inefficient from an estimation perspective. Therefore, it is important to select the samples in a way that will ensure that the test samples represent an adequate proportion of the overall sample which incorporates certain distinguishable firm- and/or industry-specific characteristics. Furthermore, Manski and Lerman (1977) and Manski and McFadden (1981) point out that such a choice based sample will provide more efficient estimates than a random sample of the same size, while Cosslett (1981) characterizes such a sample as a close-to-optimal design. Finally, I employ a number of different model selection methods, in order to ascertain the robustness of the results irrespective to the sample specification.

alternatively a market-to-book, a size-matching procedure (which is defined as the market capitalisation at the end of the year prior to the share repurchase announcement) and a non-matching procedure, for robustness check of the results.

The industry-, market-to-book-, and size-matching procedures are performed on a one-to-one basis, meaning that for every test firm, a unique control firm that complies with the requirements of each matching method is selected. For the industry-matched samples, I select randomly the control firms from the same two-digit Standard Industry Classification (SIC) code that have not announced a share repurchase programme within the whole ten year period of this study and I assign them with a company from the test-sample, that has the same two-digit industry code. For the market-to-book matching method, I randomly select a control firm that has not made a repurchase announcement within the whole ten year period under study, and with a market-to-book ratio that falls within a ten percent range above or below the respective level of the test firm, during the year of the repurchase announcement. Similarly, for the size-matched method, I randomly select a control firm, a firm that has not made a repurchase announcement within the entire ten year period under study, and with a respective market value that falls within a ten percent range above or below the respective level of the test, during the year of the repurchase announcement. Finally, for robustness check, I do not match a repurchasing firm with a specific non-repurchasing firm. Rather, I include in the model all the firms that are trading in each respective stock exchange in each year, for the ten year period under study. In this case, all firms that have made a share repurchase announcement appear throughout the ten year period as repurchasing (test) firms and the remaining firms that have never made a share repurchase announcement throughout the ten year period are employed as non-repurchasing (control) firms.

Table 2.1 reports the number of repurchasing and non-repurchasing firms that met the criteria for each of the four matching procedures. It should be noted though that apart for the non-matched samples for every repurchasing firm there is an equivalent non-repurchasing firm, meaning that half of the total number of firms per annum are repurchasing firms and the other half are non-repurchasing firms for each matching procedure. It should be noted though, that due to the fact that each test firm is matched with a unique control firm which appears only once in the sample of control firms and due to the respective criteria restriction imposed on each matching method (industry, size and market-to-book) yields smaller test samples, relative to the

initial 970 open market share repurchase announcements. This is also the reason why the samples from each matching method differ significantly between them.

Table 2.1 Annual distribution of test and control firms for the four matching methods in each country

This table contains the number of firms on a per year basis, for each matching method. It should be noted that the matching for each method apart for the non-matched samples method that has taken place is on a one-to-one basis. This means that for every test firm there is a matched control firm that has not made an open market share repurchase announcement during the ten-year period under study.

Industry-Matched				
	United Kingdom	Germany	France	**Total**
1997	20	0	2	**22**
1998	48	2	30	**80**
1999	36	16	40	**92**
2000	34	42	74	**150**
2001	56	64	26	**146**
2002	88	50	52	**190**
2003	82	30	56	**168**
2004	100	30	48	**178**
2005	116	48	28	**192**
2006	108	40	64	**212**
Test Sample	344	161	210	**715**
Control Sample	344	161	210	**715**
Total	**688**	**322**	**420**	**1,430**

Size-Matched				
	United Kingdom	Germany	France	**Total**
1997	20	0	0	**20**
1998	48	2	20	**50**
1999	38	12	28	**50**
2000	38	32	62	**70**
2001	50	56	20	**106**
2002	80	48	42	**128**
2003	70	24	48	**94**
2004	56	20	20	**76**
2005	68	44	10	**112**
2006	66	40	44	**106**
Test Sample	267	139	147	**406**
Control Sample	267	139	147	**406**
Total	**534**	**278**	**294**	**812**

MKBK-Matched				
	United Kingdom	Germany	France	**Total**
1997	20	0	2	**22**
1998	52	2	32	**86**
1999	44	12	36	**92**
2000	42	32	80	**154**
2001	54	48	26	**128**
2002	96	48	50	**194**
2003	90	28	52	**170**
2004	102	26	38	**166**
2005	124	52	26	**202**
2006	114	54	64	**232**
Test Sample	369	151	203	**520**
Control Sample	369	151	203	**520**
Total	**738**	**302**	**406**	**1,040**

Non-Matched				
	United Kingdom	Germany	France	**Total**
1997	1,019	285	245	**1,549**
1998	1,007	293	263	**1,563**
1999	1,098	297	251	**1,646**
2000	1,025	300	243	**1,568**
2001	1,087	295	205	**1,587**
2002	1,235	270	203	**1,708**
2003	1,200	222	183	**1,605**
2004	1,165	194	164	**1,523**
2005	1,281	204	142	**1,627**
2006	1,426	186	160	**1,772**
Test Sample	417	261	259	**937**
Control Sample	11,126	2,285	1,800	**15,211**
Total	**11,543**	**2,546**	**2,059**	**16,148**

2.3.2. Methodology

In order to estimate what are the managerial incentives for announcing an open market share repurchase, a standard binary logit model is employed. Hence, I can determine the functional relationship between the firm characteristics and the probability of an open market share repurchase announcement taking place in a given period:

$$p_{(i,t)} = \frac{1}{1 + e^{-\beta x(i,t)}} \qquad\qquad (2.1)$$

where $p_{(i,t)}$ is the probability that the firm i will announce a share repurchase programme in period t, $x(i,t)$ is a vector of financial variables with potential discriminatory ability, and β is a vector of unknown parameters to be estimated.

As previously discussed, the (predominantly U.S.) existing literature has developed certain hypotheses that are more likely to explain the motives behind a share repurchase and the respective market reaction as well as the ascertaining of some key financial variables which are highly characteristic of share repurchasing firms. Therefore, these variables are more likely to influence the probability of a firm announcing a share repurchase. Further, I discuss a series of logit models that have been employed under different matching procedures for the control firms.

2.3.3. Optimal cut-off probability

Prediction tests typically involve distinguishing a group of firms into two categories. In the case of this research, the group of firms is distinguished from those which announce a share repurchase and to those which do not make such an announcement, based in the estimated share repurchase probability. But in order to classify each firm of a given sample, the estimated share repurchase announcement probability is compared to a predefined cut-off probability, and if the estimated probability is less than the predefined cut-off probability, then the firm is classified as a non-repurchasing firm.

In the same context, but in the mergers and acquisitions field, Palepu (1986) argues that the appropriate cut-off probability that is to be employed in the prediction tests is determined by the decision context in which the model's predictions are to be applied. Thus, by applying an arbitrary 0.5 cut-off probability the results of the

prediction tests from each logit model will not be accurate and subsequently difficult to interpret. Therefore, instead of relying on a simple à priori cut-off probability of 0.5, I follow Palepu (1986) and for each of the applied logit models I calculate the optimal cut-off probability.

The condition that allows to determine the optimal cut-off probability is the following:

$$\frac{f_1(p|i = \text{repurchasing})}{f_2(p|i = \text{non} - \text{repurchasing})} \geq 1 \qquad (2.2)$$

where $f_1(.)$ is the distribution probability of repurchasing among the group of firms that have announced an open market share repurchase and $f_2(.)$ is the corresponding distribution for those firms that have not made such an announcement. From condition (2.2) in order to determine the optimal cut-off probability, the conditional probability density functions of $f_1(.)$ and $f_2(.)$ must be known first. I achieve this by plotting the distribution of the estimated probabilities for the repurchasing and non-repurchasing firms that is used to estimate the model parameters, therefore obtaining empirical approximations for $f_1(.)$ and $f_2(.)$. Thus, the optimal cut-off probability is the value where the two plots intersect. An example of the probability distributions plot that provides the optimal cut-off point is illustrated in Figure 2.1.

Figure 2.1. Plot of probability distributions for optimal cut-off point.

This figure presents the plot of the probability distributions of the repurchasing (test) firms and the non-repurchasing (control) firms, in order to estimate the optimal cut-off probability point for the market-to-book matching method in the United Kingdom. It has been estimated it to be 0.68.
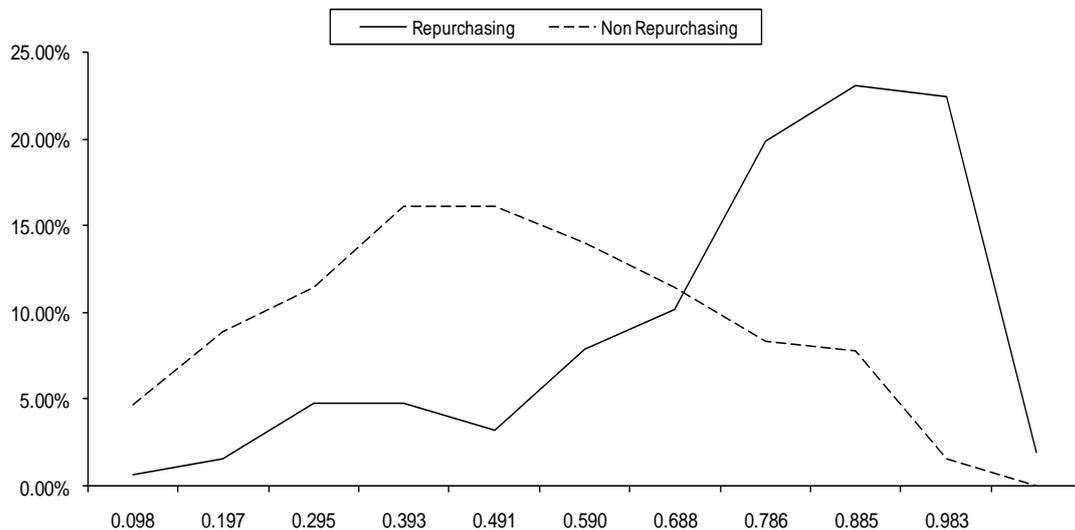
2.4. Empirical evidence

2.4.1. Univariate Analysis

For both groups, repurchasing and non-repurchasing firms, I collect a list of financial variables with potential discriminatory ability, as discussed in the literature review section, at the end of the year preceding the year in which the share repurchase announcement took place. The firm characteristics for each group of firms (test and control firms) and for each country are presented in Table 2.2. Panels A and B present the firm characteristics and summary statistics for the industry- and the size-matched matched samples whereas Panels C and D present the respective characteristics for the market-to-book-matched and the non-matched samples respectively. It should be noted that for the market-to-book- and size-matched methods, the differences in means (between the sample and control firms) for the respective market-to-book and size proxy variables are not reported since I control for these variables.

What is most apparent from all four matching methods is that, firms in all three countries that have announced their intention to repurchase their shares, have a significantly lower ownership concentration level. This supports my expectations that firms with lower levels of ownership concentration would be more prone to announce a share repurchase as a means of a self-imposed discipline mechanism for reducing potential agency costs. Moreover, I see that the levels of ownership concentration for both the test and control samples vary across the three countries, from which the ownership concentration for the U.K. firms is the lowest compared to Germany and France.

Further, in the industry matched samples, I see that for all three countries repurchasing firms have significantly higher excess cash and are larger in size, compared to non-repurchasing firms, as proxied by cash flow and total assets respectively. This suggests that repurchasing firms are larger in size and distribute their excess cash flows through a share repurchase. When examining the leverage ratios though, I find that it is only in the German market that repurchasing firms have significantly lower leverage ratios compared to their respective counterparts. This suggests that repurchasing firms in Germany are trying to exploit their excess debt capacity. In order to see if firms that announce a share repurchase are trying to signal their undervaluation, I find that their market-to-book ratios (which are used as proxies

of undervaluation) are not significantly different compared to the control sample for all three countries.

In order to check if repurchasing firms have a lower growth than non-repurchasing firms, I find that their growth as captured by the Tobin's q, is only for the case of the U.K. that the test firms have a significantly lower q compared to their matched counterparts. Nevertheless, I find that it is the combination of having a lower growth ratio (Tobin's q) and higher excess cash compared to the median industry ratios respectively. Finally, I find that for France only, the test sample has a significantly higher dividend yield ratio, suggesting that repurchasing firms pay out more cash dividends and have on average a shareholder clientele with a higher tax rate compared to non-repurchasing firms of the same industry.

Table 2.2 Univariate analysis between test and control firms.

This table presents the univariate analysis results, which contains the mean values for each reported variable and their respective t-tests of the difference in mean values assuming unequal variances, for the two groups of repurchasing and non repurchasing firms, for the period 1997 to 2006. Panel A presents the results of the univariate analysis from the industry matching method. Panel B presents the respective univariate analysis results from the market-to-book matching method. Panel C presents the respective univariate analysis results from the size matching method. Panel D presents the respective univariate analysis results from the non-matched samples. Financial companies are excluded from the samples. CF is the ratio of net operating income before taxes and depreciation to total assets at the year end prior to the repurchase announcement. Tobin's q is the ratio of a firm's ratio of its market value to the value of its gross capital stock adjusted for inflation, at the year end prior to the repurchase announcement. DFCF is a dummy variable that takes the value of one for firms that have simultaneously low Tobin's q (lower than the median q of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise. LVG is the ratio of total debt divided by its total assets. ROA is defined as the ratio of a firm's net income to its total assets at the year end prior to the share repurchase announcement. SIZE is the natural logarithm of a firm's total assets at the year end prior to the share repurchase announcement. RET 1yr is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days). RET 20 daily market-adjusted stock returns for the period of -20 to -2 days prior to the announcement of intention to repurchase. MKBK is a firm's market value compared to its book value of assets at year end prior to share repurchase announcement. OWN CON is the percent of closely held shares divided by the number of total common shares outstanding. DIV_Y is a firm's dividend yield ratio at the year end prior to the announcement of the intention to repurchase shares. The p-values for the difference in means are reported in italics below the mean values of each variable. The number of observations are reported in brackets. The standard deviation, minimum and maximum values for each variable for the test and control samples respectively are reported in parentheses.

Panel A.			**Industry - Matched**			
	UNITED KINGDOM		GERMANY		FRANCE	
	Test	Control	Test	Control	Test	Control
REP_DUMMY	1	0	1	0	1	0
	-		-		-	
	[345],	[345],	[161],	[161],	[210],	[210],
	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)
CF	0.098	-0.003	0.152	0.071	0.108	0.086
	0.000		0.150		0.130	
	[328],	[247],	[159],	[156],	[206], (0.072, -0.123,	[178],
	(0.190, -2.504, 0.529)	(0.377, -2.771, 0.621)	(0.663, -0.664, 8.346)	(0.227, -1.572, 0.927)	0.371)	(0.185, -1.769, 0.422)

Table 2.2 Panel A., Continued.

TOBIN'S Q	1.416	1.756	1.480	1.278	1.450	1.513
		0.144		0.252		0.788
	[336],	[261],	[161],	[150],	[207],	[171],
	(1.312, 0.062, 7.857)	(3.568, 0, 46.512)	(1.824, 0.265, 17.53)	(1.252, 0.087, 9.445)	(1.992, 0.251, 19.46)	(2.449, 0.030, 22.355)
DFCF	0.368	0.195	0.335	0.298	0.374	0.148
		0.000		0.474		0.000
	[345],	[345],	[161],	[161],	[210],	[210],
	(0.483, 0, 1)	(0.397, 0, 1)	(0.474, 0, 1)	(0.459, 0, 1)	(0.485, 0, 1)	(0.356, 0, 1)
LVG	0.234	0.433	0.137	0.189	0.224	0.210
		0.374		0.005		0.412
	[337],	[306],	[161],	[161],	[209],	[189],
	(0.184, 0, 0.928)	(3.908, 0, 68.285)	(0.140, 0, 0.545)	(0.188, 0, 0.935)	(0.144, 0, 0.583)	(0.175, 0, 1.119)
ROA	0.039	-0.678	0.025	-0.040	0.032	0.005
		0.189		0.004		0.031
	[337],	[307],	[160],	[161],	[209],	[190],
	(0.135, -1.653, 0.323)	(9.545, -1.670, 1.423)	(0.125, -1.050, 0.367)	(0.258, -1.895, 0.538)	(0.086, -0.536, 0.458)	(0.147, -0.824, 0.257)
SIZE (millions $)	10,452.38	369.86	9,111.67	767.46	8,242.40	910.34
		0.000		0.001		0.000
	[337],	[292],	[151], (29,429.15,9.920,18,561)	[155],	[209], (15,330.38,3.988,89,207)	[189], (6,339.54,0.857,83,346)
	(30,582.4,2.623,18,354)	(13,92.9, 0.004, 14,229)		(2,753.4, 1.082, 26565)		
RET 1YR %	0.002	0.003	-0.019	-0.012	-0.003	-0.023
		0.868		0.664		0.128
	[345],	[345],	[161],	[161],	[210], (0.128, -0.538, 0.334)	[210],
	(0.085, -0.459, 0.334)	(0.113, -0.421, 0.649)	(0.111, -0.434, 0.344)	(0.148, -0.844, 0.668)		(0.145, -0.715, 0.465)
RET 20D %	0.001	0.002	-0.019	-0.008	-0.005	-0.029
		0.877		0.538		0.079
	[345],	[345],	[161],	[161],	[210],	[210],
	(0.086, -0.468, 0.302)	(0.113, -0.411, 0.660)	(0.112, -0.465, 0.326)	(0.194, -0.999, 1.469)	(0.127, -0.515, 0.333)	(0.153, -0.720, 0.469)

Table 2.2 Panel A., Continued.

MKBK	2.715	2.826	3.034	2.776	2.714	2.293
	0.700		0.449		0.071	
	[328],	[267],	[155],	[141],	[209],	[172],
	(3.357, 0.070, 25.801)	(3.566, 0.250, 29.27)	(2.861, 0.410, 21.070)	(2.988, 0.080, 20.846)	(2.398,1.190, 17.590)	(2.125, 1.450, 14.110)
OWN CON %	20.484	38.094	41.892	59.003	44.888	63.680
	0.000		0.000		0.000	
	[332],	[287],	[128],	[90],	[191],	[108],
	(22.565, 0.001, 91.633)	(23.860, 0.009, 98.169)	(22.988, 0.004, 96.100)	(27.696, 0.018, 99.850)	(24.833, 0.060, 98.900)	(21.769, 6.210, 99.901)
DIV_Y	2.963	2.061	1.607	1.578	1.860	1.680
	0.000		0.896		0.350	
	[339],	[256],	[158],	[149],	[205],	[174],
	(2.538, 0.000, 26.769)	(2.7913, 0.000, 25.671)	(1.738, 0.000, 7.0744)	(2.131, 0.000, 11.288)	(1.649, 0.000, 11.656)	(2.049, 0.000, 11.750)
DIV/NI	-1.312	0.944	1.018	0.289	2.494	0.108
	0.533		0.077		0.003	
		[345],	[156],	[161],	[155],	[208],
	[315],	(12.224,-13.631, 21.896)				
	(6.309, -4.710, 26.489)		(4.894, -1.619, 28.726)	(1.493, -9.300, 8.943)	(9.678,-1.782,70.599)	(0.937, -3.355, 9.846)

Panel B.			MKBK – Matched			
	UNITED KINGDOM		GERMANY		FRANCE	
	Test	Control	Test	Control	Test	Control
REP_DUMMY	1	0	1	0	1	0
	-		-		-	
	[330],	[408],	[165],	[136],	[224],	[180],
	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)

Table 2.2 Panel B., Continued.

CF	0.139	0.085	0.127	0.109	0.125	0.106
		0.000		0.280		0.209
	[326],	[197],	[161],	[90],	[216],	[87],
	(0.130, -1.148, 0.476)	(0.156, -0.695, 0.513)	(0.179, -1.649, 0.445)	(0.083, -0.086, 0.433)	(0.106, -0.515, 0.485)	(0.125, -0.494, 0.635)
TOBIN'S Q	1.506	1.102	1.430	0.869	1.416	1.334
		0		0.000		0.711
	[326],	[196],	[165],	[91],	[221],	[89],
	(1.129, 0.246, 7.577)	(1.055, 0.121, 9.343)	(1.779, 0.244, 17.690)	(0.526, 0.096, 3.606)	(1.900, 0.251, 18.760)	(1.708, 0.159, 12.682)
DFCF	0.376	0.598	0.364	0.537	0.375	0.461
		0.000		0.003		0.082
	[330],	[408],	[165],	[136],	[224],	[180],
	(0.485, 0, 1)	(0.491, 0, 1)	(0.483, 0, 1)	(0.500, 0, 1)	(0.485, 0, 1)	(0.499, 0, 1)
LVG	0.212	0.192	0.140	0.195	0.224	0.181
		0.144		0.013		0.012
	[327],	[198],	[165],	[91],	[222],	[89],
	(0.165, 0.000, 0.835)	(0.150, 0.000, 0.794)	(0.140, 0.000, 0.545)	(0.179, 0.000, 0.682)	(0.142, 0.000, 0.583)	(0.134, 0.000, 0.472)
ROA	0.051	0.006	0.021	0.012	0.032	-0.134
		0.001		0.605		0.265
	[328],	[199],	[165],	[91],	[222],	[90],
	(0.150, -1.615, 0.948)	(0.158, -0.876, 0.528)	(0.205, -2.092, 0.371)	(0.066, -0.210, 0.231)	(0.093, -0.612, 0.447)	(1.406, -13.27, 0.239)
SIZE	12,385.810	28,690.780	11,768.580	21,573.470	9,167.521	26,513.350
(millions $)		0.000		0.026		0.000
	[324],	[312],	[163],	[110],	[218],	[109],
	(32,704.62,5.218,18,354)	(42,063.08,0.168,11,674)	(31,110.05,9.505,19,769)	(37,886, 3.221, 116,747)	(17,938.78,7.428,12,705)	(39,117.2,5.262,11,674)
RET 1YR %	0.001	0.000	-0.020	0.021	-0.006	-0.001
		0.883		0.002		0.679
	[330],	[408],	[165],	[136],	[224],	[180],
	(0.108, -0.669, 0.628)	(0.098, -0.412, 0.814)	(0.109, -0.482, 0.344)	(0.113, -0.191, 0.804)	(0.129, -0.538, 0.396)	(0.080, -0.470, 0.328)

Table 2.2 Panel B., Continued.

RET 20D %	0.001	0.001	-0.019	0.025	-0.008	-0.002
		0.999		0.001		0.564
	[330],	[408],	[165],	[136],	[224],	[180],
	(0.109, -0.657, 0.622)	(0.102, -0.387, 0.827)	(0.112, -0.505, 0.326)	(0.116, -0.209, 0.804)	(0.130, -0.515, 0.414)	(0.079, -0.447, 0.232)
MKBK	5.491	3.080	2.790	3.507	2.657	2.986
		0.369		0.347		0.265
	[330],	[408],	[165],	[136],	[224],	[180],
	(4.832, 0.286, 29.580)	(6.137, 0.434, 27.220)	(2.955, 0.330, 22.110)	(8.451, 0.030, 29.660)	(2.775, 1.440, 24.860)	(3.064, 0.300, 21.99)
OWN CON %	0.179	0.324	0.405	0.670	0.443	0.638
		0.000		0.000		0.000
	[319],	[194],	[131],	[73],	[203],	[76],
	(0.191, 0.000, 0.916)	(0.215, 0.000, 0.964)	(0.238, 0.000, 0.961)	(0.293, 0.067, 0.999)	(0.249, 0.000, 0.989)	(0.239, 0.001, 0.9940)
DIV_Y	3.407	3.291	1.675	2.389	2.802	2.725
		0.632		0.021		0.792
	[330],	[408],	[165],	[136],	[224],	[180],
	(2.495, 0.000, 17.550)	(4.000, 0.000, 25.140)	(2.013, 0.000, 13.190)	(3.099, 0.000, 25.740)	(2.558, 0.000, 17.280)	(3.159, 0.000, 28.94)
DIV/NI	1.018	0.181	0.394	0.168	0.307	-0.091
		0.188		0.076		0.007
	[330],	[408],	[165],	[136],	[224],	[180],
	(1.141,-1.410, 5.205)	(1.859, -1.715, 18.642)	(1.502, -1.243, 17.786)	(0.575, -2.889, 2.386)	(1.055, -2.098, 13.832)	(1.705, -2.720, 3.708)

Panel C.	<u>**Size - Matched**</u>					
	UNITED KINGDOM		GERMANY		FRANCE	
	Test	Control	Test	Control	Test	Control
REP_DUMMY	1	0	1	0	1	0
	-		-		-	
	[242],	[292],	[159],	[120],	[165],	[129],
	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)

Table 2.2 Panel C., Continued.

CF	0.128	0.115	0.119	0.127	0.122	0.126
		0.285		0.650		0.755
	[241],	[292],	[155],	[119],	[159],	[124],
	(0.146, -1.148, 0.561)	(0.138, -0.808, 0.388)	(0.184, -1.649, 0.445)	(0.092, -0.150, 0.442)	(0.115, -0.515, 0.485)	(0.098, -0.099, 0.645)
TOBIN'S Q	1.413	1.461	1.467	1.016	1.402	2.130
		0.712		0.005		0.423
	[241],	[289],	[159],	[120],	[165],	[128],
	(1.110, 0.159, 7.860)	(1.863, 0.137, 23.682)	(1.790, 0.199, 17.690)	(0.838, 0.000, 6.322)	(1.977, 0.251, 18.760)	(10.117, 0.092, 14.820)
DFCF	0.388	0.356	0.358	0.367	0.358	0.380
		0.444		0.889		0.696
	[242],	[292],	[159],	[120],	[165],	[129],
	(0.488, 0, 1)	(0.479, 0, 1)	(0.481, 0, 1)	(0.484, 0, 1)	(0.481, 0, 1)	(0.487, 0, 1)
LVG	0.200	0.216	0.128	0.165	0.214	0.221
		0.273		0.037		0.715
	[242],	[292],	[159],	[120],	[165],	[129],
	(0.169, 0.000, 0.835)	(0.169, 0.000, 0.992)	(0.135, 0.000, 0.545)	(0.157, 0.000, 0.552)	(0.145, 0.000, 0.583)	(0.148, 0.000, 0.833)
ROA	0.041	0.027	0.017	0.034	0.029	0.034
		0.309		0.325		0.593
	[242],	[292],	[159],	[119],	[165],	[128],
	(0.151, -1.679, 0.341)	(0.160, -1.754, 0.278)	(0.202, -1.956, 0.347)	(0.070, -0.224, 0.288)	(0.109, -0.658, 0.450)	(0.064, -0.237, 0.255)
SIZE	1,539.183	1,119.996	3,267.734	2,628.623	3,189.252	5,090.943
(millions $)		0.127		0.604		0.276
	[237],	[284],	[154],	[115],	[165],	[121],
	(3,694.9, 5.272, 32,685)	(2,235.9, 2.927, 15,032)	(10,371.6, 9.920, 86,434)	(9,686.3, 3.459, 96,802)	(7,853.8, 3.988, 59,879)	(17,917, 6.453, 16,919)
RET 1YR %	0.000	0.009	-0.023	-0.003	-0.008	-0.001
		0.372		0.156		0.640
	[242],	[292],	[159],	[120],	[165],	[129],
	(0.125, -0.669, 0.628)	(0.110, -0.567, 0.608)	(0.119, -0.481, 0.344)	(0.111, -0.279, 0.733)	(0.143, -0.538, 0.396)	(0.117, -0.326, 0.664)

Table 2.2 Panel C., Continued.

	UK Test	UK Control	Germany Test	Germany Control	France Test	France Control
RET 20D %	0.000	0.009	-0.022	-0.002	-0.012	-0.005
		0.368		0.139		0.633
	[242],	[292],	[159],	[120],	[165],	[129],
	(0.126, -0.657, 0.621)	(0.113, -0.564, 0.589)	(0.119, -0.505, 0.326)	(0.107, -0.277, 0.687)	(0.142, -0.515, 0.413)	(0.119, -0.347, 0.660)
MKBK	2.838	1.911	3.071	2.491	2.818	2.673
		0.803		0.063		0.689
	[238],	[282],	[154],	[116],	[165],	[117],
	(5.581, 0.039, 27.315)	(13.372, 0.019, 32.757)	(3.077, 0.526, 21.610)	(2.010, 0.050, 21.320)	(3.244, 0.390, 31.760)	(2.808, 0.010, 27.006)
OWN CON %	0.205	0.248	0.421	0.723	0.486	0.657
		0.018		0.000		0.000
	[236],	[289],	[128],	[96],	[149],	[106],
	(0.201, 0.000, 0.875)	(0.222, 0.000, 0.894)	(0.233, 0.000, 0.961)	(0.272, 0.002, 0.990)	(0.233, 0.000, 0.917)	(0.251, 0.001, 0.980)
DIV_Y	3.152	2.894	1.586	2.389	1.696	1.845
		0.189		0.002		0.526
	[240],	[290],	[157],	[116],	[164],	[122],
	(2.299, 0.000, 9.833)	(2.194, 0.000, 12.244)	(1.774, 0.000, 7.074)	(2.310, 0.000, 9.091)	(1.738, 0.000, 11.656)	(2.109, 0.000, 14.667)
DIV/NI	0.169	0.475	0.344	0.814	0.289	0.245
		0.401		0.040		0.776
	[241],	[292],	[155],	[115],	[165],	[127],
	(1.142, -8.74, 4.896)	(13.032, -18.37, 18.469)	(1.288, -1.365, 14.467)	(2.166, -0.705, 18.210)	(1.088, -2.304, 12.057)	(1.474, -5.731, 14.930)

Non - Matched

Panel D.	UNITED KINGDOM		GERMANY		FRANCE	
	Test	Control	Test	Control	Test	Control
REP_DUMMY	1	0	1	0	1	0
	-		-		-	
	[317],	[29,190],	[171],	[9,280],	[220],	[11,053],
	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)	(0, 1, 1)	(0, 0, 0)

Table 2.2 Panel D., Continued.

CF	0.140	-0.484	1.111	1.536	11.102	12.535
	0.006		0.263		0.866	
	[313],	[13,732],	[168],	[5,898],	[211],	[5,821],
	(0.139, -1.148, 0.561)	(26.432,-23.720, 113.9)	(3.827, -4.244, 7.887)	(18.158,-29.478, 49.050)	(9.235, -26.490, 12.300)	(40.498,-27.265, 24.982)
TOBIN'S Q	1.651	3.792	1.442	1.479	1.390	1.342
	0.043		0.816		0.716	
	[314],	[12,434],	[171],	[5,088],	[216],	[5,138],
	(1.382, 0.159, 7.859)	(11.800, 0.000, 29.750)	(1.771, 0.244, 17.690)	(5.931, 0.000, 35.555)	(1.876, 0.251, 18.760)	(2.863, 0.000, 24.820)
DFCF	0.371	0.204	0.357	0.244	0.371	0.224
	0.000		0.003		0.000	
	[313],	[12,314],	[168],	[4,991],	[210],	[4,949],
	(0.484, 0, 1)	(0.403, 0, 1)	(0.481, 0, 1)	(0.429, 0, 1)	(0.484, 0, 1)	(0.417, 0, 1)
LVG	0.223	0.295	2.892	1.610	47.949	162.944
	0.003		0.203		0.022	
	[315],	[13,926],	[169],	[5,908],	[217],	[6,045],
	(0.176, 0.000, 0.835)	(2.638, 0.000, 1.702)	(1.469, 0.000, 1.923)	(5.799, 0.000, 9.943)	(1.446, 0.171, 1.462)	(3.446, 0.142, 2.473)
ROA	0.047	-0.638	2.594	0.618	5.578	1.076
	0.002		0.208		0.419	
	[315],	[13,954],	[169],	[5,929],	[217],	[6,059],
	(0.148, -1.615, 0.334)	(26.918, -2.379, 11.390)	(2.0324,-0.571, 26.020)	(17.040,-23.970, 22.400)	(5.4931, -6.332, 17.096)	(13.221,-13.260, 15.677)
SIZE	4,496.710	2,567.126	6,792.704	500.569	25,899.100	3,677.102
(millions $)	0.000		0.000		0.000	
	[315],	[13,965],	[169],	[5,929],	[217],	[6,059],
	(27,2063, 26.23, 17,169)	(11,187, 0.205,22,157)	(16,887.1, 0.080, 10,386)	(2,839, 0.010, 89,910)	(62,402, 0.020, 51,991)	(22,449, 0.010, 34,934)
RET 1YR %	-	-	-	-	-	-
		-		-		-
	-	-	-	-	-	-

Table 2.2 Panel D., Continued.

RET 20D %	-	-	-	-	-	-
		-		-		-
	-	-	-	-	-	-
MKBK	2.138	5197.460	3.267	10.588	3.120	3.693
		0.245		0.002		0.476
	[306],	[18,761],	[162],	[6,108],	[219],	[6,923],
	(0.237, 0.406, 19.654)	(6.125, 0.032, 28.000)	(2.465, 0.591, 35.010)	(18.553, 0.275., 29.971)	(1.986, 0.430, 27.934)	(5.779, 0.123, 39.00)
OWN CON %	18.214	35.841	45.603	69.107	48.176	66.696
		0.000		0.000		0.000
	[309],	[12,723],	[78],	[2,930],	[150],	[2,680],
	(19.280, 0.000, 91.633)	(23.413, 0.000, 99.990)	(26.033, 7.435, 99.099)	(23.086, 7.66, 99.999)	(24.729, 2.127, 99.008)	(20.891, 1.442, 99.998)
DIV_Y	3.314	2.573	1.350	1.596	2.670	11.173
		0		0.068		0.000
	[317],	[20,133],	[171],	[6,572],	[220],	[7,490],
	(2.549, 0.000, 19.920)	(5.178, 0.000, 23.529)	(1.575, 0.000, 7.730)	(4.847, 0.000, 17.867)	(2.394, 0.000, 20.550)	(18.311, 0.000, 26.860)
DIV/NI	1.282	0.343	0.352	0.971	0.331	0.236
		0.164		0.075		0.229
	[312],	[13,756],	[167],	[5,431],	[218],	[5,745],
	(11.838,-15.410, 20.500)	(7.969,-36.200, 33.875)	(1.469, -1.243, 17.786)	(24.190,-30.078, 18.780)	(1.059, -1.878, 13.832)	(2.420, -78.93, 11.246)

When matching the sample firms with the respective control sample by size, I find that it is only in Germany and France that repurchasing firms have a tax clientele with a lower tax rate as captured by dividend yield and have significantly lower leverage ratios. This suggests that firms in these two markets are motivated to announce a share repurchase when they have low leverage ratios, which supports the excess debt capacity hypothesis as well as having shareholders that fall into lower tax brackets, compared to non-repurchasing firms. Finally, I find that in Germany, repurchasing firms have a significantly lower growth (captured by Tobin's q) compared to non-repurchasing firms of similar size.

For the market-to-book matched method, I find that repurchasing firms have significantly larger size compared to their matched counterparts, suggesting that it is larger firms that announce a share repurchase. Further, I find that in the U.K., repurchasing firms have significantly lower profitability compared to their matched counterparts. In addition U.K. repurchasing firms have higher growth rates, excess cash flows as well as higher leverage ratios compared to non-repurchasing firms of similar market-to-book valuation ratios. Hence, repurchasing firms in the U.K. are larger but have also higher growth potential, suggesting that they are not mature but rather high growth firms that want to signal their undervaluation.

Similarly, in Germany I find that repurchasing firms have significantly higher growth ratios, but contrary to the U.K., repurchasing firms in Germany have significantly lower leverage ratios, suggesting that firms are trying to exploit their excess debt capacity. This suggests that repurchasing firms in Germany are smaller and higher growth firms that are trying to signal their undervaluation. Moreover, I find that repurchasing firms pay out fewer dividends compared to non-repurchasing firms of similar valuation. Finally, for the market-to-book matching method for France, I find that repurchasing firms have significantly lower levels of ownership concentration and are larger in size, suggesting that it is larger firms that tend to announce a share repurchase programme.

For the non-matched samples, the findings support in their overwhelming majority the results derived from the previous three matching methods and consistent with my expectations. For all three countries, I find that repurchasing firms compared to the non-repurchasing firms have significantly lower growth and high cash flows (as captured by the DFCF dummy), lower ownership concentration and are significantly larger in size. Moreover, in the U.K. and France, repurchasing firms have significantly

lower leverage. In addition, I find that in Germany, repurchasing firms are significantly undervalued compared to the non-repurchasing firms. Finally, it is interesting to find that in the U.K., contrary to Germany and France, repurchasing firms pay high dividends and cater higher tax shareholder clienteles, as captured by the dividend yield ratio.

To summarise, the most striking finding in the univariate comparison between firms that announce a share repurchase and those that do not, is that repurchasing firms have significantly lower ownership concentration levels, which is translated to the fact that more diversely owned companies repurchase their shares in order to self discipline the management and reduce the respective agency costs. In addition, I find some evidence for the excess cash flow and excess debt hypotheses as well as the fact that size, growth and dividend yield ratios are variables that can have a discriminatory ability which can be useful in order to determine the characteristics of firms that announce their intention to repurchase their shares. This in turn will help identify the managerial incentives for announcing an open market share repurchase and estimating the probability of a firm making such an announcement.

2.4.2. Multivariate analysis

By estimating a series of logit regressions, I am able to test the significance and influence of each of the previously discussed managerial incentives for announcing a share repurchase. In the analysis, I apply the same logit model for each country. I replicate all the models for the non-matched and the size- and market-to-book-matched control samples for robustness check. It should be noted though, that for the size matched samples I exclude the *SIZE* proxy, whereas for the market-to-book matched samples I exclude the undervaluation proxy *MKBK*, since I have already controlled for these variables in each matching method respectively.

Table 2.3 reports the results from the logit regressions, derived from each country and for all four matching methods. It should be noted that the correlations between the variables are lower than 0.5, as reported in the correlation matrix reported in Appendix A. However, in cases where independent variables are statistically correlated with one another, auxiliary regressions are employed in order to make them orthogonal. Furthermore, Table 2.4 reports the marginal effects of each explanatory variable on managers' likelihood to announce an open market share repurchase.

What is most apparent is that for all three countries, ownership concentration and size have a significant impact on the decision to announce a share repurchase. This shows that for the three countries under study there are only two factors that consistently influence the decision to announce a share repurchase. I find that for each matching method and for all three countries, ownership concentration is inversely related with the decision to announce a share repurchase, whereas size has a positive and significant impact on the repurchase announcement, which is in line with my expectations. For instance, for the industry matching method, the estimates imply that a one standard deviation increase in ownership concentration reduces the likelihood of a firm making an open market share repurchase announcement by approximately 19% in the U.K., by 19% in Germany and even larger reduction of approximately 24% in France. This effect of ownership concentration on managers' incentive to announce their intention to repurchase shares in the open market is consistent through the market-to-book- and size-matched samples. With the exception of the non-matched samples where even though it has a negative impact it is of smaller magnitude due to the overwhelmingly larger control sample relative to the test samples. These findings on ownership concentration are similar to the results reported in Oswald and Young (2008) where they report a negative and significant relationship of both the insider and external ownership and the likelihood to actually repurchase shares.

Furthermore, for the industry-matched samples a one standard deviation change in size increases the likelihood of an open market share repurchase announcement by 24% in the U.K., and by approximately 15% in Germany and 20% in France. This shows that even though size is a significant factor that influences managers' incentives to announce an open market share repurchase, its impact varies significantly between countries. The consistent effect of ownership concentration and size regardless of the sample matching method, can be translated to the fact that in all three countries (i) widely held firms are more likely to announce a share repurchase; and (ii) that the larger a firm is, the higher is the probability of announcing an open market share repurchase programme.

Table 2.3 Multivariate analysis on the managerial determinants of the propensity to announce an open market share repurchase

This table presents the estimation results for each country, for the industry-, market-to-book-, size-matching and non-matched sample matching methods, for the period 1997 to 2006. Financial companies are excluded from the samples. CF is the ratio of net operating income before taxes and depreciation to total assets at the year end prior to the repurchase announcement. DFCF is a dummy variable that takes the value of one for firms that have simultaneously low Tobin's q (lower than the median q of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise. LVG is the ratio of total debt divided by its total assets. OWN CON is the percent of closely held shares divided by the number of total common shares outstanding. SIZE is the natural logarithm of a firm's total assets at the year-end prior to the share repurchase announcement. RET 1yr is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days). MKBK is a firm's market value compared to its book value of equity, at the year end prior to share repurchase announcement. DTAX is a dummy variable that takes the value of one for every event (both test- and control-firms) that take place during the time periods where for each of the three countries capital gains were taxed lower than the personal income tax. DIV_Y is a firm's dividend yield ratio at the year end prior to the announcement of the intention to repurchase shares. DIV/NI is the ratio of a firm's total cash dividend payout divided by its respective net income reported at the year end prior to the announcement of the intention to repurchase shares. Below the values of the estimated coefficients of each model, the respective p-values of significance are reported. ***,**, and * indicate the statistical significance at the 1, 5 and 10% level respectively. The table reports the goodness-of-fit and robustness for each model as measured by the McFadden R-squared, Hosmer-Lemeshow (H-L) statistics and the respective probability chi square value for the H-L statistics. Finally, the table reports the estimated optimal cut-off probability point for each model individually and presents the percentages of correct predictions made by the model for the repurchasing, non-repurchasing and total sample of firms.

	Industry - Matched			MKBK - Matched			Size – Matched			Non-Matched		
	U.K.	GE	FR	U.K.	GE	FR	U.K.	GE	FR	U.K.	GE	FR
C	1.291***	0.855***	2.364***	0.714***	-5.235***	0.825**	-0.179	2.702***	0.588*	-5.050***	-2.119***	-1.116***
	(0.000)	(0.004)	(0.000)	(0.008)	(0.000)	(0.023)	(0.431)	(0.000)	(0.075)	(0.000)	(0.000)	(0.000)
CF	0.413	0.039	4.132**	1.283	1.094	1.707	0.572	-1.171	-0.734	0.104***	-0.035	-0.003
	(0.394)	(0.823)	(0.047)	(0.246)	(0.430)	(0.310)	(0.471)	(0.393)	(0.610)	(0.000)	(0.856)	(0.465)
DFCF	0.679***	-0.327	0.830**	-0.224	-0.407	-0.426	0.101	0.422	0.158	-0.371**	-0.107	0.299
	(0.006)	(0.406)	(0.043)	(0.331)	(0.285)	(0.224)	(0.602)	(0.263)	(0.594)	(0.011)	(0.707)	(0.129)
LVG	-0.119	-1.718	0.033	1.173	-3.190***	3.254***	-0.355	-2.759**	-0.175	-1.012**	-0.049	0.000
	(0.841)	(0.116)	(0.976)	(0.102)	(0.006)	(0.003)	(0.523)	(0.021)	(0.867)	(0.016)	(0.350)	(0.669)
OWN_CON	-0.036***	-0.031***	-0.046***	-4.011***	-3.453***	-3.879***	-1.022**	-4.404***	-2.999***	-0.010***	-0.030***	-0.031***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.020)	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)
SIZE	0.490***	0.339***	0.464***	0.563***	0.461***	0.391***				1.004***	0.656***	0.425***

	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
RET 1YR	-0.762	-0.171	0.630	0.111	-2.612*	0.162	-0.693	-0.972	-0.572			
	(0.459)	(0.903)	(0.604)	(0.907)	(0.074)	(0.905)	(0.396)	(0.557)	(0.577)			
MKBK	-0.029	-0.013	0.205***				0.001	0.145**	0.012	0.000	0.000	0.001
	(0.329)	(0.823)	(0.007)				(0.703)	(0.046)	(0.803)	(0.993)	(0.977)	(0.237)
DTAX	0.156	0.026	0.149	-0.069	-0.481	-0.487	-0.138	-0.325	-0.079	0.275*	0.386	0.599*
	(0.496)	(0.954)	(0.743)	(0.757)	(0.279)	(0.207)	(0.483)	(0.504)	(0.815)	(0.054)	(0.165)	(0.050)
DIV_ Y	0.076**	-0.013	-0.074	-0.044	-0.320***	-0.004	0.043	-0.158*	-0.076	0.126***	-0.149*	-0.038
	(0.027)	(0.873)	(0.497)	(0.270)	(0.005)	(0.942)	(0.320)	(0.075)	(0.230)	(0.000)	(0.078)	(0.178)
DIV/NI	-0.003	0.068**	0.177***	0.003	0.197	0.517**	0.008	-0.063	0.063	0.009***	0.000	0.082
	(0.231)	(0.040)	(0.002)	(0.756)	(0.549)	(0.042)	(0.378)	(0.518)	(0.498)	(0.004)	(0.937)	(0.221)
McFadden R^2	0.201	0.149	0.306	0.218	0.278	0.213	0.014	0.250	0.089	0.275	0.271	0.199
Total Observations	482	193	219	510	201	272	511	211	240	10645	1867	1893
H-L Statistic	12.156	5.800	2.520	18.674	7.601	10.546	3.376	7.053	8.375	15.077	8.127	4.423
Prob. $\chi^2(8)$	0.144	0.670	0.961	0.017	0.473	0.229	0.909	0.531	0.398	0.058	0.421	0.817
Optimal Cut-off point	*0.590*	*0.564*	*0.591*	*0.680*	*0.742*	*0.679*	*0.467*	*0.556*	*0.531*	*0.110*	*0.134*	*0.136*
% Correct Control	73.87	67.53	76.74	55.76	76.92	50.00	55.76	76.92	50.00	0.110	0.134	0.136
% Correct Test	72.79	67.24	77.44	56.22	75.00	75.00	56.22	75.00	75.00	95.86	95.43	88.78
% Correct Total	**73.24**	**67.36**	**77.17**	**55.97**	**75.83**	**65.00**	**55.97**	**75.83**	**65.00**	**49.16**	**51.39**	**55.48**

Further, I find evidence that in France and Germany, undervaluation as captured by the market-to-book ratio, is a significant factor for a share repurchase announcement. However, it is only in France that the marginal effect of market-to-book ratio on the likelihood of a share repurchase announcement is significant. Moreover, I find only in Germany, for the market-to-book matched samples, that past market-adjusted returns (which are used as alternative proxies of undervaluation) are inversely related to the likelihood of a share repurchase announcement.

Additionally, I find evidence that in the U.K. and France, the combination of low growth and excess cash flow, as captured by the dummy variable *DFCF*, has a significant effect on the management's decision to announce a share repurchase. In particular, a one standard deviation change of the dummy variably *DFCF* causes an approximately 7% increase in the likelihood to announce an open market share repurchase programme in the U.K. and France respectively. When comparing firms of the same industry, a firm is most likely to announce a share repurchase when it has low growth and high excess cash flows. However, when comparing firms of similar market valuation measured by the market-to-book ratio and for the non-matched samples (except for the U.K.) firms of low growth and excess cash will be less likely to announce a share repurchase.

Moreover, in the U.K. when matching the repurchasing with the non-repurchasing firms that belong to the same industry, as well as for the non-matched samples, I find that dividend yield has a positive and significant effect on the decision to announce a share repurchase. In particular, a on standard deviation change in dividend yield causes an increase of 4% on the likelihood of a share repurchase announcement. This suggests that repurchasing firms cater to the demands of a higher tax clientele and are more likely to pay out cash dividends. Similarly, I find that in France for the industry-, and market-to-book-matched samples, and in Germany for the industry-matched samples, the ratio of cash dividends to net income *(DIV/NI)*, is positively and significantly related to the propensity of announcing a share repurchase. However, it is only in France that a one standard deviation change in the *DIV/NI* variable causes a small but significant increase (0.07%) on the likelihood to announce an open market share repurchase programme. This can be interpreted as the fact that the more firms are paying as dividends from their earnings, the more likely they are to announce a share repurchase. Hence the evidence support the hypothesis that share repurchases are complements rather than substitutes of dividends, which is consistent with the findings of Dittmar (2000) and Jagannathan and Stephens (2003) in the U.S., and Mitchell and Dharmawan (2007) in Australia.

Table 2.4 Marginal effects of the managerial determinants on the propensity to announce an open market share repurchase

This table reports the marginal effects from the logit estimation results for each country, for the industry-, market-to-book-, size-matching and non-matched sample matching methods, for the period 1997 to 2006. Financial companies are excluded from the samples. CF is the ratio of net operating income before taxes and depreciation to total assets at the year end prior to the repurchase announcement. DFCF is a dummy variable that takes the value of one for firms that have simultaneously low Tobin's q (lower than the median q of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise. LVG is the ratio of total debt divided by its total assets. OWN CON is the percent of closely held shares divided by the number of total common shares outstanding. SIZE is the natural logarithm of a firm's total assets at the year end prior to the share repurchase announcement. RET 1yr is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days). MKBK is a firm's market value compared to its book value of equity, at the year end prior to share repurchase announcement. DTAX is a dummy variable that takes the value of one for every event (both test- and control-firms) that take place during the time periods where for each of the three countries capital gains were taxed lower than the personal income tax. DIV_Y is a firm's dividend yield ratio at the year end prior to the announcement of the intention to repurchase shares. DIV/NI is the ratio of a firm's total cash dividend payout divided by its respective net income reported at the year end prior to the announcement of the intention to repurchase shares. The first entry in the table is the marginal effect on the likelihood to announce an open market share repurchase programme. The second entry is the marginal effect multiplied by the standard deviation of the explanatory variable. The third entry (reported in parentheses) is the *p-value* of the marginal effect.

	Industry - Matched			MKBK - Matched			Size – Matched			Non-Matched		
	U.K.	GE	FR	U.K.	GE	FR	U.K.	GE	FR	U.K.	GE	FR
CF	0.095	0.009	0.848*	0.286	0.229	0.281	0.142	-0.281	-0.174	0.001***	0.000	0.000
	0.025	0.005	0.066	0.039	0.035	0.031	0.020	-0.041	-0.018	0.014	-0.002	-0.048
	(0.442)	(0.912)	(0.071)	(0.142)	(0.546)	(0.232)	(0.412)	(0.518)	(0.618)	(0.003)	(0.861)	(0.857)
DFCF	0.152***	-0.077	0.156**	-0.050	-0.086	-0.072	0.025	0.100	0.037	-0.003***	-0.001	0.013
	0.068	-0.036	0.069	-0.025	-0.043	-0.036	0.012	0.048	0.018	-0.001	-0.001	0.005
	(0.003)	(0.399)	(0.032)	(0.333)	(0.296)	(0.248)	(0.601)	(0.252)	(0.602)	(0.005)	(0.709)	(0.140)
LVG	-0.008	-0.401	0.007	0.261*	-0.667***	0.536***	-0.088	-0.663	-0.041	-0.008***	-0.001	0.000
	-0.022	-0.067	0.001	0.042	-0.102	0.076	-0.015	-0.097	-0.006	-0.021	-0.033	-0.024
	(0.953)	(0.133)	(0.975)	(0.085)	(0.007)	(0.003)	(0.522)	(0.018)	(0.866)	(0.008)	(0.168)	(0.916)
OWN_CON	-0.008***	-0.007***	-0.009***	-0.893***	-0.722***	-0.639***	-0.253**	-1.058***	-0.710***	0.000***	0.000***	-0.001***
	-0.194	-0.187	-0.239	-0.186	-0.192	-0.164	-0.053	-0.308	-0.178	-0.002	-0.008	-0.027
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.020)	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)

SIZE	0.106***	0.079***	0.095***	0.125***	0.097***	0.064***				0.008***	0.008***	0.017***
	0.241	0.151	0.196	0.246	0.223	0.126				0.015	0.015	0.040
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
RET 1YR	-0.192	-0.040	0.129	0.025	-0.547	0.027	-0.172	-0.234	-0.135			
	-0.019	-0.005	0.018	0.003	-0.062	0.003	-0.020	-0.027	-0.018			
	(0.459)	(0.899)	(0.583)	(0.895)	(0.140)	(0.906)	(0.385)	(0.546)	(0.605)			
MKBK	-0.007	-0.003	0.042**				0.000	0.035*	0.003	0.000	0.000	0.000
	-0.023	-0.009	0.744				0.008	0.094	0.009	-0.033	0.000	0.003
	(0.382)	(0.828)	(0.015)				(0.728)	(0.077)	(0.821)	(0.995)	(0.993)	(0.712)
D TAX	0.033	0.006	0.030	-0.015	-0.106	-0.086	-0.034	-0.079	-0.019	0.002	0.005	0.031
	0.021	0.001	0.007	-0.007	-0.038	-0.036	-0.016	-0.030	-0.007	0.001*	0.002	0.009
	(0.541)	(0.956)	(0.734)	(0.763)	(0.325)	(0.246)	(0.482)	(0.476)	(0.827)	(0.050)	(0.194)	(0.109)
DIV_Y	0.015*	-0.003	-0.015	-0.010	-0.067***	-0.001	0.011	-0.038*	-0.018	0.001***	-0.002*	-0.002
	0.041	-0.006	-0.028	-0.033	-0.171	-0.002	0.024	-0.071	-0.034	0.003	-0.008	-0.279
	(0.080)	(0.882)	(0.476)	(0.230)	(0.001)	(0.947)	(0.309)	(0.095)	(0.307)	(0.000)	(0.097)	(0.266)
DIV/NI	0.009	0.016	0.036***	0.001	0.041	0.085**	0.002	-0.015	0.015	0.000*	0.000	0.003
	0.099	0.057	0.235	0.006	0.049	0.119	0.018	-0.026	0.019	0.001	0.000	0.008
	(0.100)	(0.108)	(0.007)	(0.855)	(0.507)	(0.049)	(0.510)	(0.569)	(0.535)	(0.087)	(0.984)	(0.418)
Observations	482	193	219	510	201	272	511	211	240	10,645	1,867	1,893
Log Likelihood	-259.18	-110.41	-101.89	-264.37	-94.61	-125.36	-347.19	-108.23	-147.21	-987.50	-222.32	-411.76

Regarding the impact of the tax advantage on the repurchase announcement, I find that it is only in the U.K. for the non-matched sample, that the tax differential *(DTAX)* between capital gains and personal income tax has a positive and significant impact on the propensity to announce a share repurchase. This suggests, that only in the U.K. when capital gains are taxed on a lower rate compared to personal income tax, firms are more likely to announce a share repurchase programme. Furthermore, this finding suggests, that in France and Germany, the personal tax incentive hypothesis does not weigh significantly on managers' incentive to announce a share repurchase. Furthermore, the findings on ownership concentration and the free cash flow are consistent with the ones reported in Mitchell and Dharmawan (2007) for the Australian market. However, some of the previously discussed results are contrary to the findings derived from the Australian market reported in Mitchell and Dharmawan (2007). This highlights the fact that the managerial incentives in European countries and in Australia, as well as within Europe, vary significantly.

Nevertheless, some of the managerial incentives are consistent in all three sample countries. For verifying the consistent impact of the firm specific characteristics that influence the likelihood of managers announcing an open market share repurchase, I select the industry-matched samples, which have the highest McFadden R-squared values, and allows to control for industry-specific characteristics. Then, I merge the samples from each country into one unified sample, and estimate the new model as shown in Table 2.5. The respective marginal effects estimations are reported in Table 2.6. The results show that the firm specific characteristics that are statistically significant in each of the three countries, namely ownership concentration and size, are also significant for the entire sample. This supports the previous finding that large and widely held firms are, consistently throughout the sample countries, more likely to announce an open market share repurchase. Furthermore, the results show that on a one standard deviation increase in size significantly increases the likelihood of a repurchase announcement by approximately 30%. Similarly, a one standard deviation decrease in ownership concentration leads to a significant increase in the likelihood to announce an open market share repurchase.

Table 2.5. Multivariate analysis on the persistence of the determinants of the propensity to announce an open market share repurchase

This table presents the estimation results for the industry-matched sample for the unified sample of all three countries from the industry-matched samples, for the period 1997 to 2006. Financial companies are excluded from the samples. CF is the ratio of net operating income before taxes and depreciation to total assets at the year end prior to the repurchase announcement. DFCF is a dummy variable that takes the value of one for firms that have simultaneously low Tobin's q (lower than the median q of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise. LVG is the ratio of total debt divided by its total assets. OWN CON is the percent of closely held shares divided by the number of total common shares outstanding. SIZE is the natural logarithm of a firm's total assets at the year end prior to the share repurchase announcement. RET 1yr is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days). MKBK is a firm's market value compared to its book value of equity, at the year end prior to share repurchase announcement. DTAX is a dummy variable that takes the value of one for every event (both test- and control-firms) that take place during the time periods where for each of the three countries capital gains were taxed lower than the personal income tax. DIV_Y is a firm's dividend yield ratio at the year end prior to the announcement of the intention to repurchase shares. DIV/NI is the ratio of a firm's total cash dividend payout divided by its respective net income reported at the year end prior to the announcement of the intention to repurchase shares. D_UK is a dummy variable that takes the value of one for every sample firm (both test- and control-firms) in the UK and zero otherwise. D_FR is a dummy variable that takes the value of one for every sample firm (both test- and control-firms) in France and zero otherwise. Below the values of the estimated coefficients of each model, the respective p-values of significance are reported. ***, **, and * indicate the statistical significance at the 1, 5 and 10% level respectively. The table reports the goodness-of-fit and robustness for each model as measured by the McFadden R-squared, Hosmer-Lemeshow (H-L) statistics and the respective probability chi square value for the H-L statistics. Finally, the table reports the estimated optimal cut-off probability point for each model individually and presents the percentages of correct predictions made by the model for the repurchasing, non-repurchasing and total sample of firms.

	All Countries Combined (industry-matched)		
	(1)	(2)	(3)
C	-5.129***	2.104***	-4.158***
	(0.000)	(0.000)	(0.000)
CF			0.405
			(0.300)
DFCF			0.336*
			(0.055)
LVG	-1.246***	-1.276***	-1.317***
	(0.003)	(0.002)	(0.006)
OWN_CON	-0.011***	-0.033***	-0.015***
	(0.000)	(0.000)	(0.000)
SIZE	0.485***	0.462***	0.414***
	(0.000)	(0.000)	(0.000)
RET 1YR			-0.465
			(0.470)
MKBK			0.016
			(0.514)
DUM TAX	-0.249*	-0.056	0.078
	(0.099)	(0.735)	(0.659)
DIV YIELD			-0.005
			(0.880)
DIVNI			-0.002
			(0.359)
DUM_UK		-0.358	-0.258
		(0.101)	(0.288)
DUM_FR		0.310	0.248
		(0.149)	(0.276)
McFadden	0.218	0.225	0.181
Total Obs	1,134	1,134	894
H-L Statistic	14.489	8.850	4.593
Prob. Chi-Sq(8)	0.070	0.355	0.800
Optimal Cut-off point	0.573	0.610	0.648
% Correct _ Control	75.88	78.97	78.18
% Correct _ Test	71.03	67.64	62.41
% Correct _ Total	**73.10**	**72.49**	**68.79**

However, contrary to the findings of the analysis in each country individually, it is surprising to find that it is also leverage that has a negative and significant impact on the decision to announce an open market share repurchase. In particular, a one standard deviation decrease in leverage causes a significant 50% increase in the likelihood to announce an open market share repurchase programme. This suggests, that firms that have low leverage, are more likely to announce a share repurchase. In addition, I find that the combination of high excess cash and low growth, captured by the dummy variable *DFCF*, has a significant impact but only on the 10% confidence interval, and that a one standard deviation change causes 3.5% increase in the likelihood of a share repurchase programme being announced.

Furthermore, the results show, contrary to my expectations, that when capital gains are taxed lower than the personal income tax as captured by the dummy variable *DTAX*, the likelihood of announcing a share repurchase decreases. However, the dummy variable *DTAX* is only marginally statistically significant, and therefore one should be very cautious on interpreting the implications of the tax impact on the likelihood to announce an open market share repurchase. Regarding the models' performance on predicting the likelihood of a firm announcing an open market share repurchase, I find that the models perform successfully, since model 1 (excluding the two country dummies), correctly identifies approximately 71% of the test firms, and correctly identifies approximately 73% of both test and control firms.

In summary, I find that there are only three factors that consistently have a significant impact on the decision to announce a share repurchase (namely size, leverage, and ownership concentration), through different markets and institutional settings. This suggests, that large, widely held firms that have low leverage, are more likely to announce their intention to repurchase their shares in the open market. In addition, I find that for each market, there are varying firm specific characteristics that can influence the announcement of a share repurchase in each country individually.

Table 2.6 Marginal effects of the managerial determinants on the propensity to announce an open market share repurchase

This table reports the marginal effects from the logit estimation results for each country, for the unified sample of all three countries from the industry-matched sample for the period 1997 to 2006. Financial companies are excluded from the samples. CF is the ratio of net operating income before taxes and depreciation to total assets at the year end prior to the repurchase announcement. DFCF is a dummy variable that takes the value of one for firms that have simultaneously low Tobin's q (lower than the median q of a firm's respective industry for each respective year) and high cash flow (higher than the median cash flow of the respective industry for each year) and the value of zero otherwise. LVG is the ratio of total debt divided by its total assets. OWN CON is the percent of closely held shares divided by the number of total common shares outstanding. SIZE is the natural logarithm of a firm's total assets at the year end prior to the share repurchase announcement. RET 1yr is the cumulative daily market-adjusted stock returns for the entire year prior to the announcement of a share repurchase (-261 to -2 days). MKBK is a firm's market value compared to its book value of equity, at the year end prior to share repurchase announcement. DTAX is a dummy variable that takes the value of one for every event (both test- and control-firms) that take place during the time periods where for each of the three countries capital gains were taxed lower than the personal income tax. DIV_Y is a firm's dividend yield ratio at the year end prior to the announcement of the intention to repurchase shares. DIV/NI is the ratio of a firm's total cash dividend payout divided by its respective net income reported at the year end prior to the announcement of the intention to repurchase shares. The first entry in the table is the marginal effect on the likelihood to announce an open market share repurchase programme. The second entry is the marginal effect multiplied by the standard deviation of the explanatory variable. The third entry (reported in parentheses) is the *p-value* of the marginal effect.

	All Countries Combined (industry-matched)		
	(1)	(2)	(3)
CF			0.095
			0.031
			(0.341)
DFCF			0.077**
			0.035
			(0.049)
LVG	-0.303***	-0.310***	-0.308***
	-0.562	-0.576	-0.573
	(0.002)	(0.002)	(0.006)
OWN_CON	-0.003***	-0.008***	-0.004***
	-0.071	-0.221	-0.100
	(0.000)	(0.000)	(0.000)
SIZE	0.118***	0.112***	0.097***
	0.328	0.278	0.269
	(0.000)	(0.000)	(0.000)
RET 1YR			-0.109
			-0.013
			(0.480)
MKBK			0.004
			0.011
			(0.543)
DUM TAX	-0.061*	-0.014	0.018
	-0.030	-0.007	0.009
	(0.086)	(0.727)	(0.664)

Table 2.6 Continued.

DIV YIELD			-0.001
			-0.002
			(0.886)
DIVNI			0.000
			-0.016
			(0.529)
DUM_UK		-0.087*	-0.060
		-0.043	-0.030
		(0.087)	(0.271)
DUM_FR		0.074	0.057
		0.037	0.026
		(0.129)	(0.271)
No. of Observations	1,134	1,134	894
Log Likelihood	-605.55	-600.05	-494.49

2.4.3. Model Selection

Having reviewed the influence of each explanatory variable on the decision to announce a share repurchase, I now focus on the industry-matched models that have the highest predicting ability of a firm announcing a share repurchase. Even though the non-matched samples have higher overall prediction ability compared to the industry-matched samples, they perform poorly on correctly predicting the repurchasing firms. As shown in Table 2.7, the industry-matched models have the highest McFadden R-squared values, which is an indicator of the model's goodness of fit. In addition, the Hosmer-Lemeshow statistics for goodness-of-fit and the respective chi-square statistics are reported, suggesting that the models' estimates fit the data at an acceptable level. Finally, the optimal cut-off probability points are reported, and they have been calculated as discussed earlier in section 2.3.

After applying the estimated optimal cut-off point for each of the respective models for each country, I find that the models have a strong predicting ability. For the U.K. the models correctly predict approximately 73% of the total sample, from which approximately 73% of the sample firms that have indeed announced a share repurchase are correctly identified by the model as repurchasing firms, whereas the model correctly identifies approximately 74% of the control firms as non-repurchasing firms. Similarly, for France the models have an overall correct predicting ability of approximately 77% overall, of which 77% of the test sample is correctly identified as repurchasing firms and approximately 76% of the control firms are correctly identified as non-repurchasing

firms. For Germany, the models have a relatively lower predicting ability compared to the U.K. and France. Nevertheless, the models in Germany correctly predict approximately 67% of the total sample, of which 67% of both the test- and control-firms are correctly identified.

In order to test the robustness of the models, I run additional in- and out-of-sample tests, using a boot-strap simulation technique. Since the industry matching-method yields on average the highest proportions of correct repurchase likelihood predictions, I report the results from the boot-strap simulation for the industry-matched samples. The approach on the boot-strap technique is the following. From the overall sample of test and control firms for each country I randomly select 85% of the firms and I estimate the logit models discussed above for each country. This sample of 85% of the total sample of firms forms the basis of the simulated in-sample results. The remaining 15% of the observations are then used in order to assess how well the model performs on an out-of-sample basis, as well as for the respective calculation of Type I and Type II errors. This simulation is repeated 5,000 times, selecting a different random in-sample of 85% of the overall sample of firms each time.

The average results from the boot-strap technique for each country are reported in Table 2.7. Panels A, B, and C, report the estimation outputs for the industry-matched samples of the U.K., Germany, and France respectively. Panel D reports the estimation outputs for the combined sample of all three countries, excluding the two country dummies (model 1). The coefficient estimates from the boot-strap simulation are similar to the ones reported in the original logit model, without any significant changes on the interpretation of the results. Further, the results for correctly identifying both a repurchasing and a non-repurchasing firm overall are similar to the ones reported in the original logit model. However, the results from the boot-strap simulation display significantly higher results for correctly identifying the repurchasing firms of slightly more than 85% in all three countries. The results on the whole, show the robustness of the original logit models in predicting the likelihood of a firm announcing a share repurchase programme. Furthermore, the results in each of the three countries for the correct prediction of the likelihood of a repurchase announcement are higher than the ones reported in Mitchell and Dharmawan (2007) and Barth and Kasznik (1999), even after checking for their robustness with a boot-strap technique.

Table 2.7 Boot-strap simulation for the identification of the managerial determinants of the propensity to announce an open market share repurchase.

In-sample logit model with a boot-strap technique (5000 simulations). This table presents the estimates for the in-sample logit model for estimating the impact of selected factors on the decision to announce a share repurchase, by employing the industry-matched method. In addition the table presents the percentages (average values) correctly classified in the in- and out-of-sample models for each country. The in-sample selection is as follows. For the U.K., I randomly select 428 companies out of a total of 504 (Panel A). For Germany, I randomly select 164 companies out of a total of 193 (Panel B). For France, I randomly select 189 companies out of a total of 223 (Panel C). For the unified sample of all three countries, I randomly select 965 companies out of a total of 1135 (Panel D).

Panel A. **UNITED KINGDOM**

	C	CF	DFCF	LVG	OWN_CON	SIZE	RET 1YR	MKBK	DTAX	DIV_Y	DIV/NI
@0.025	-6.662***	0.174	0.510**	-1.442**	-0.008*	0.431***	-1.524	-0.049	-0.008	-0.013	-0.005***
@0.5	-5.801***	0.383	0.678***	-0.947	-0.004*	0.481***	-0.761	-0.026	0.161	0.016	-0.003
@0.975	-5.133***	1.698*	0.863***	-0.505	0.001*	0.547***	-0.018	0.000	0.322	0.043	-0.001
Average	**-5.828*****	**0.491**	**0.681*****	**-0.952**	**-0.004***	**0.483*****	**-0.765**	**-0.025**	**0.160**	**0.016**	**-0.003**

	Repurchasers					Non-Repurchasers					
	% Correct	Type I error %				% Correct	Type II error %				Total Correct %
In-sample	86.97%	13.03%				74.50%	25.50%				81.83%
Out-of-Sample	85.89%	14.11%				65.94%	34.06%				77.13%

Panel B. **GERMANY**

	C	CF	DFCF	LVG	OWN_CON	SIZE	RET 1YR	MKBK	DTAX	DIV_Y	DIV/NI
@0.025	-6.114***	2.414***	0.511*	-2.044***	-0.039***	0.384***	-0.496*	0.094	-0.265	-0.181	0.112
@0.5	-4.666	4.178	0.839	-1.019***	-0.030***	0.466***	0.602	0.165	0.148	-0.075	0.150
@0.975	-3.460	6.175	1.250	0.033	-0.024**	0.583***	1.795	0.246	0.585	0.022	0.242
Average	**-4.689**	**4.206**	**0.848**	**-1.008*****	**-0.030*****	**0.470*****	**0.615**	**0.166**	**0.151**	**-0.076**	**0.157**

	Repurchasers					Non-Repurchasers					
	% Correct	Type I error %				% Correct	Type II error %				Total Correct %
In-sample	87.71%	12.29%				42.58%	57.42%				69.77%
Out-of-Sample	82.85%	17.15%				37.54%	62.46%				64.34%

Table 2.7 Continued.

Panel C.   **FRANCE**

	C	CF	DFCF	LVG	OWN_CON	SIZE	RET 1YR	MKBK	DTAX	DIV_Y	DIV/NI
@0.025	-3.371***	-2.521	-0.694	-4.198*	-0.032***	0.257***	-2.517	-0.065	-0.372	-0.082*	-0.023**
@0.5	-2.142***	0.048*	-0.321*	-3.107	-0.025***	0.342***	-1.145	-0.013*	0.036	-0.004	0.011***
@0.975	-0.943**	0.238***	0.014***	-2.110	-0.019***	0.446***	0.047	0.047***	0.464	0.074	0.049**
Average	**-2.145*****	**-0.226***	**-0.325***	**-3.117**	**-0.025*****	**0.345*****	**-1.170**	**-0.012***	**0.038**	**-0.004**	**0.012*****

	Repurchasers					Non-Repurchasers					
	% Correct	Type I error %				% Correct	Type II error %				Total Correct %
In-sample	87.05%	12.95%				63.09%	36.91%				77.68%
Out-of-Sample	83.51%	16.49%				58.59%	41.41%				73.45%

Panel D.   **All three countries**

	C	LVG	OWN_CON	SIZE	DUM TAX
@0.025	-5.129***	-1.246***	-0.011***	0.485***	-0.249*
@0.5	-5.129***	-1.246***	-0.011***	0.485***	-0.249*
@0.975	-5.129***	-1.246***	-0.011***	0.485***	-0.249*
Average	-5.129***	-1.246***	-0.011***	0.485***	-0.249*

	Repurchasers		Non-Repurchasers		
	% Correct	Type I error %	% Correct	Type II error %	Total Correct %
In-sample	85.53%	14.47%	75.70%	24.30%	81.32%
Out-of-Sample	85.44%	14.56%	62.80%	37.20%	81.31%

In summary, the models display a good performance in successfully predicting the likelihood of a firm announcing a share repurchase, especially in the U.K. and France. Further, I find that in each country not all the firm characteristics have a significant impact on the decision to announce an open market share repurchase programme. Rather, it is only size, leverage, and ownership concentration that have a significant impact on managers' decision to announce an open market share repurchase programme throughout the three sample countries.

2.5. Summary and Conclusions

The goal of this chapter is to identify the main factors and financial firm characteristics that influence a firm's decision to announce a share repurchase and to construct an accurate model that predicts the probability of a firm making an open market share repurchase announcement.

In order to achieve this goal, I construct an initial (test) sample of 970 announcements of intention to repurchase shares in the open market, from corporations primarily listed in the United Kingdom (513 announcements), France (263 announcements) and Germany (194 announcements). After collecting the sample of firms that have announced a share repurchase (test-sample), I proceed to the construction of the control firms sample. I do this by employing an industry-, a market-to-book-, a size-matching and a non-matching method which yield a total sample (test- and control-firms combined) of 1,430, 1,040, 812, and 16,148 events respectively. Then, I construct a number of logit models in order to identify the managerial incentives for announcing open market share repurchases in each of the three countries under study.

The results show that for all three countries, some factors have a consistently significant impact on the announcement of share repurchases. I find that in all three countries, firms that are large, have lower leverage, and have low levels of ownership concentration, are more likely to announce their intention to repurchase their shares in the open market. Further, I find only in the U.K. that a firms' low growth with high excess cash levels, can have a significant impact on the likelihood of announcing a share repurchase. In addition, I find some evidence in France and Germany, that a firm's potential undervaluation has a significant impact on the decision to announce a share repurchase. Finally, I find evidence that the dividend pay out has a positive

relationship with the propensity to announce a share repurchase, hence supporting the hypothesis that share repurchases are viewed by managers as complements rather than substitutes to dividends.

The contribution of this chapter is the identification of the determinants that influence the firms' decision to announce their intention to repurchase their shares in the open market in a cross-country dimension, thus accounting for cultural, regulatory and institutional differences among the countries under study. Hence, I identify which motives have a consistent effect on the announcement of a share repurchase in all three of the largest and most important European markets, and to what extent. In addition, this study constructs and presents a model with a strong ability of predicting the likelihood of a firm making a share repurchase announcement in each of the three countries under study.

Chapter 3.
3. The Market Valuation of Share Repurchases in Europe

In this chapter I investigate the market reaction to the announcement of intention to repurchase shares by a sample of U.K., French and German firms over the period 1997 to 2006. I find that although the practice is highly popular in the three markets, the market reaction is mainly positive only in the U.K. and Germany. I also show that the positive market reaction is concentrated on the first announcement of intention to repurchase and is affected by fundamental factors such as firm size and the ownership concentration. Finally, I find that changes in regulations and taxation have a significant impact on the market reaction to share repurchase announcements, but only in the U.K.

3.1. Introduction

In this chapter, I perform a cross country analysis on the market reaction to the announcement of intention to repurchase ordinary shares in the United Kingdom, France and Germany. A number of studies in the existing literature (see Vermaelen, 1981; Ikenberry et al., 1995; Brav et al. 2005; Stephens and Weisbach, 1998, for the U.S. and Ikenberry et al., 2000 for Canada) have already documented a positive stock price reaction to the announcement of a share repurchase programme. Despite the growing importance of share repurchases as a payout method by companies across the world, the overwhelming majority of the existing research focuses on the U.S. market[9]. Some of the most prevailing theories relate share repurchases to the undervaluation, agency theory, capital restructuring, dividend substitution, and management compensation incentive hypotheses.

However, these studies provide mixed evidence on the impact of each of these factors. In addition, these studies do not provide a comparative analysis across different institutional settings as they are a single-country analysis, where share repurchases are treated in the same way, although changes in institutional settings may occur through time. In particular, shares bought back are taxed in the same way at shareholder level and they are kept as Treasury stocks, not cancelled, at firm level. It is, therefore, difficult to separate the contending hypotheses that underlie share repurchases.

The purpose of this chapter is to overcome this limitation by assessing the market perception of the decisions to repurchase shares by a sample of firms across European countries with wide heterogeneity in terms of their institutional settings. This research is also motivated by the dearth of studies in these markets. Thus, I choose United Kingdom, France and Germany where I identify 970 share repurchase announcements that took place over the period 1997-2006. The selection of these three countries is based on the fact that previous studies have not assessed fully the weight of each of the existing hypotheses on the market reaction to open market share repurchase announcements in Europe. Furthermore, these countries have significant differences between them in tax, regulatory and corporate governance frameworks.

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[9] See Allen and Michaely (2003) for a review.

In order to identify the extent of which, each of the prominent hypotheses will affect the market's reaction towards a firm's decision to repurchase its shares, I apply a standard event methodology proposed by Brown and Warner (1985). This enables me to analyse the abnormal and cumulative abnormal returns experienced before, around and after the time of the announcement of open market share repurchases. Finally I perform a cross-sectional analysis in order to identify the drivers of the market reaction to share repurchase announcements.

In the trifling existing literature on share repurchases in Europe, Lasfer (2005) and Rau and Vermaelen (2002) report an average market reaction for the U.K. of 1.64% and 1.08% respectively, over the period 1985 to 1998. In addition, Oswald and Young (2004) in the U.K. as well, but for the period 1995 to 2000 report an average market reaction to open market share repurchases of 1.24%. Ginglinger and L'Her (2006) report an excess market reaction on share repurchasing announcements in France of 0.57% for the two year period 1998-1999.

However, these studies do not all focus on the announcement day abnormal returns and the drivers for the market reaction on the repurchasing announcements, since they focus on the tax effect (Rau and Vermaelen, 2002; Oswald and Young, 2004), or the actual trades and the long-term performance (Oswald and Young, 2004), or the corporate ownership and management's stock options (Ginglinger and L'Her, 2006). Furthermore, various regulatory and tax changes that affect share repurchases have occurred since their study period.

I assess, whether the differences in market reaction across my sample countries, can be related to the regulatory and cultural structure of each market. As reported in La Porta et al. (1997), the levels of law enforcement, shareholder ownership, and shareholder protection vary significantly among countries. In particular, although the U.K. is very similar to the U.S. market, culturally and institutionally, there are significant differences across Continental Europe countries (La Porta et al., 1999). For example, while the U.K. is, as the U.S., a common law country, France and Germany are civil law countries. Moreover, the majority of the U.K. firms are widely held whereas France and Germany have a more concentrated ownership structure. Furthermore, even between France and Germany there is a difference in the ownership concentration. While in Germany firms have a lower level of ownership concentration, banks can have a considerable voting power over a wide range of firms, since shareholders routinely sign over their voting rights to banks that manage

their stock accounts. In France a large number of firms are owned predominantly by either wealthy families or even the state (La Porta et al., 1999; and Morck et al., 2005). These institutional differences allow me to explore further the well-documented but controversial market mispricing hypothesis, suggested by, amongst others, Ikenberry et al. (1995), Comment and Jarrell (1991), and Vermaelen (1981).

As argued by Shleifer and Vishny (1997), agency costs are incurred between the controlling and the minority shareholders. Therefore, the controlling shareholders can wreak substantial costs to other shareholders by redistributing the firm's wealth. Thus, the higher the ownership concentration, the less it is possible for minority shareholders to influence the firm's decision making. Consequently, when there is a higher ownership concentration, there would be a lower level of information asymmetry, which would lead to a lower market reaction to share repurchase announcements. Moreover, Bartram et al. (2009) find that shareholder protection differs significantly between countries, which is in line with the arguments of La Porta et al. (2000). The authors also find that within a country the agency costs across firms differ as well. More specifically, they find that agency costs and growth opportunities have a smaller weight on determining corporate payout policies in poor protection countries, whereas in high shareholder protection countries shareholders are more able to pressure firms to make more committed payouts in the form of dividends.

I therefore test the proposition that these different levels of protection and ownership concentration will lead to differences in information asymmetry and the market's perception of the announcement of intention to repurchase stocks. In particular, I expect a positive market reaction in the U.K., in line with previous U.S. findings, but no or negative reaction in France and Germany, if repurchases are driven by information asymmetry and agency costs.

The treatment of share repurchases is also different across my sample countries. In Germany and France, firms are allowed to keep the repurchased shares as Treasury stock. In contrast, in the U.K., firms were permitted to keep Treasury stock only after December 2003. The argument for keeping Treasury stock is that this gives management the ability of better managing the balance between debt and equity, providing more flexibility in fund raising by reissuing the stocks when necessary, better managing of employee share schemes, disposing of the shares when necessary, permitting the investment in a company's own shares, as well as being used as a

hostile takeover deterrent. On the other hand, Treasury stocks may be a cause of concern for the market due to possible market interference by the firm who repurchases and resells its own stock, thus leading to a false market creation and share price manipulation. Consequently, Treasury stocks may be a weak signal compared to cancelling the repurchased stocks. Hence, these accounting differences will allow me to test further whether the market values the costs and benefits of Treasury stocks.

Finally, I expand on the impact that the tax consideration has on the decision to announce a share repurchase. According to the personal tax savings hypothesis, when capital gains are taxed lower than the personal income tax, then share repurchases are more beneficial for shareholders compared to regular cash dividends from a tax perspective. However, the empirical results of the tax impact on share repurchases are mixed. Bagwell and Shoven (1989) investigate the impact of the 1986 Tax Reform Act in the U.S., which increased the capital gains tax rate and spurred a number of predictions that it would reduce the practice of share repurchases. However, this tax reform only reduced and not eliminated the tax advantage share repurchases relative to cash dividends. The authors show that contrary to the predictions, cash dividend payments had fallen to 40% of total cash distributions whereas share repurchases have increased relative to the previous years, hence suggesting that the tax consideration does not have a significant impact on share repurchases.

In contrast, Lie and Lie (1999) find that the 1986 Tax Reform Act has a negative impact on the choice to distribute cash through open market share repurchases. In addition, Rau and Vermaelen (2002) investigate a number of tax changes related to share repurchases in order to answer the question whether the tax consideration has a significant impact on share repurchases in the U.K. The authors report evidence suggesting that corporate payout policy is sensitive to tax law changes in the U.K. and that managers are more sensitive to the tax status of their shareholders. Therefore, I test if any changes in the tax treatment of share repurchases in each of the three markets under study will affect the market reaction to such announcements. For this purpose, I follow Rau and Vermaelen (2002) and I investigate the market reaction to share repurchasing announcements during different time sub-periods before and after changes in tax regulations became effective, with a potential impact on share repurchases during the ten year period under study.

I hand collect data from news announcements made by all publicly listed companies in the sample countries, thus the data is in text format. I search for any

announcement of intention to repurchase shares. 970 open market share repurchase announcements during the ten year period 1997 to 2006 are identified. This shows that the majority of share repurchase announcements have taken place in the U.K. market, which is in line with the existing literature (Lasfer, 2005 and Rau and Vermaelen, 2002). This is due to the fact that share repurchases were made legal only recently in France and Germany, thus the respective markets are recently catching up with the repurchasing trend and due to the fact that share repurchases do not fit the European corporate culture (Rau and Vermaelen, 2002). Moreover, I do not find evidence of undervaluation since the pre-announcement returns are not statistically significant. Further, my results are aligned with the findings reported in Ginglinger and L'Her (2006) for France, Rau and Vermaelen (2002), Oswald and Young (2004) and Lasfer (2005) in the U.K. I find a significant abnormal market reaction of 1.58% in the U.K., and 2.32% in Germany, but not as strong in France (0.66%), on the announcement of an open market share repurchase. Nevertheless, the market reaction in all three countries is significantly lower than the average 3% abnormal return reported in the U.S. (Ikenberry at al., 1995), which is preceded by a poor market performance.

Unlike previous studies, I also test for differences in the market reaction towards initial and subsequent announcements throughout the ten year period under study. This enables me to assess if the initial announcement conveys more information than the subsequent announcements and/or if the market is more accustomed to the subsequent announcements. Further, I find a higher market reaction to the initial announcement than to the subsequent announcements. I argue that the first announcement sends a clear signal to the market that the firm's stock price is considered to be undervalued, whereas the subsequent announcements contain less information. When analysing the market reaction to solely the initial announcements of intention to repurchase, I find that the market reaction for the U.K. and Germany (2.34% and 3.07% respectively) are similar to the average 3% market reaction reported in the U.S., and is significantly higher than the average market reaction reported in prior research for the U.K. market.

Moreover, I find evidence that tax and regulatory changes do have a significant effect on the market reaction in the U.K. but not in France and Germany, since the average market reaction between a number of varying time sub-periods appears to be statistically different. Finally, the results from the cross-sectional analysis show that

firm size and past share price performance have a significant impact on the market reaction at the time of the repurchase announcement. Further analysis provides some evidence suggesting that that high ownership concentration leads to higher information asymmetry, which in turn leads to a higher market reaction, but only on the announcement date.

The remaining of this chapter is organised as follows. Section 3.2 provides a summary of the literature review, and the respective gaps that are directly linked to this research. Section 3.3 presents the data and methodology applied. Section 3.4 presents the descriptive statistics. Section 3.5 discusses the results. The conclusions are in Section 3.6.

3.2. Literature Review

Previous studies show that share prices increase significantly on the announcement of intention to buy back stocks. On average, the announcement price effect of an open market share repurchase is approximately 3%, as reported in a number of U.S. studies, whereas this is not the case for European markets. For instance Lasfer (2005) and Oswald and Young (2004) report an excess return of approximately 1.6% and 1.24% respectively in the U.K. and Ginglinger and L'Her (2006) an excess return of 0.57% in France. In addition, the market reaction is positively related to the targeted proportion of shares outstanding to be repurchased (Ikenberry et al., 1995; Grullon and Michaely, 2002). This implies that the larger the proportion, the stronger the signal of undervaluation, signifying that the management believes that the current share price is a bargain. Moreover, Ikenberry et al. (1995), Comment and Jarrell (1991) and Vermaelen (1981) report a similar in magnitude decrease in the share price, during the month prior to the announcement of intention to repurchase, suggesting that the signalling of undervaluation is a strong motive for announcing a share repurchase. Therefore, these two results suggest that companies use the share repurchase mechanism to signal their undervaluation to the market.

According to the signalling theory, a good firm can separate itself from a bad firm by giving a costly signal to the capital markets, since the bad firm will not be able to mimic this signal because it would be costlier for the bad firm. Specifically, the signalling of undervaluation hypothesis suggests that since managers are better informed, they can identify if the current share price reflects the true value of their

firm. Therefore, in order to signal the mispricing of their firm, managers announce a share repurchase programme in order to alert the market.

Nevertheless, there is a drawback with this argument. The announcement of an open market share repurchase programme is considered to be a costless signal, because even a bad firm can mimic a good firm by announcing a repurchase programme without intending to undertake such a programme, since there is no commitment for the firm to do so. Therefore, it can be argued, that signalling of undervaluation to the market via a share repurchase announcement cannot be a credible signal. On the other hand, buying back an overvalued share is costly, because the price is likely to drop at some point. In addition, a good firm can separate itself from a bad firm by sending a costless signal to the market, thus attracting the market's scrutiny, while a bad firm will not mimic this action since it will not want to be discovered (Bhattacharya and Dittmar, 2003).

Previous studies provide evidence that the market reacts more to the announcement of fixed price share repurchase programmes compared to those of an open market share repurchase announcement (e.g. Grullon and Ikenberry, 2000; Louis and White, 2006; Vermaelen, 1981; Peyer and Vermaelen, 2005). Because the firm pays a premium in order to repurchase the tendered shares, it can be translated as a costly signal to the market, thus bearing more credibility, contrary to an open market repurchase announcement, which poses no commitment to the firm, therefore being a less credible signal to the market.

Therefore, firms that wish to signal their undervaluation are more likely to proceed to a fixed-price tender offer, since they are considered to be costly signals, thus making them more credible. However, the majority of firms that undertake a share repurchase and wish to signal their undervaluation, repurchase their shares in the open market, even though they are perceived to be costless signals, thus making them less credible.

Nevertheless, previous predominantly U.S. studies show that the market reacts positively to the announcement of an open market share repurchase (3% on average) even though they are costless signals. On the other hand, studies that investigate other markets such as Canada (Ikenberry et al., 2000) and Europe (Lasfer, 2005; Ginglinger and L'Her, 2006; Oswald and Young, 2004; Rau and Vermaelen, 2002) report a much smaller market reaction on open market repurchase announcements of approximately 1% on the days surrounding the announcement date. Further, Stephens and Weisbach

(1998) report evidence derived from the U.S. market, that firms repurchase either a substantial fraction of the announced shares or almost none at all. Bhattacharya and Dittmar (2003), argue that firms make a repurchase announcement but do not proceed with the actual repurchase because the signal has already worked, meaning that the firm has already attracted the market's scrutiny. Finally, McNally (1999) argues that firms might not complete their announced repurchase programme because their goal of raising their share price has already been achieved.

It has been widely discussed in the literature that when a firm's capital exceeds its investment opportunities, then it can distribute its excess cash back to its shareholders as a self-imposed discipline mechanism on the managers, in order to reduce the potential agency costs (Easterbrook, 1984; and Jensen, 1986). In line with this hypothesis, Grullon and Michaely (2004) find that repurchasing firms experience a decrease in their capital expenditures and research and development expenses. In addition, Oswald and Young (2008) find that non-repurchasing firms with similar characteristics of repurchasing firms are more likely to overinvest. This suggests that firms repurchase their shares in order to avoid overinvesting their capital and consequently reducing potential agency costs. Furthermore, Dittmar (2000) and Mitchell and Dharmawan (2007) report evidence that firms are more likely to repurchase their stock when they have high cash flows and low investment opportunities.

When a firm chooses to distribute its excess capital as a payout to its shareholders through a share repurchase, it reduces its equity capital, which in turn increases its leverage ratio. Consequently, Bagwell and Shoven (1988) and Hovakimian et al. (2001) argue that a share repurchase programme, displays the managers' preference to employ debt instead of equity, so that they can approach their target leverage ratio. Hovakimian et al. (2001) find evidence suggesting that firms with low leverage and high profitability are more likely to repurchase their shares than retire debt. In line with these findings, are Mitchell and Dharmawan (2007), and Dittmar (2000), who find that firms with lower than average leverage ratios are more likely to repurchase their shares. However, Grullon and Michaely (2004) argue that open market share repurchases are used for making small capital adjustments rather than a large capital restructuring.

In Continental Europe countries, share repurchases are subject to severe legal restrictions, such as the volume and the time frame in which they can take place. This

is contrary to the U.S., where there is no limitation concerning the volume and the time limit for carrying out a share repurchase programme. Therefore the effects of share repurchases could vary significantly across countries.

Moreover, it can be clear that the regulatory restrictions can have a significant impact on some of the characteristics of open market share repurchases, such as the flexibility on the time period to undertake the programme and the volume of shares intended to be reacquired by a firm. For instance in France, it was only until recently that the legal system was reformed, thus allowing corporations to repurchase their own shares. Under the July 2, 1998 law, the open market share repurchases can be authorized by the firm's shareholders for up to the limit of 10% of a firm's capital and can extend for a maximum period of 18 months. For each 24-month period shares representing 10% of a firm's capital can be cancelled or be kept as Treasury stock, which is subject to shareholder authorisation. In the U.K., even though share repurchases were legal since 1981, they started to become popular in recent years due to the ambiguity of the tax treatment, and the potential signalling of a shortage of profitable investments.

In Germany, prior to the legislation passed on May 1, 1998, share repurchases were illegal since they were perceived to be a prohibited repayment of capital and it was only for extraordinary and on individual cases that share repurchases were permitted. But the amendment of the legislation, which is based on the European Second Law Directive, opened the way for companies in Germany to repurchase their stock. Likewise, in France, companies were allowed in 1998 to repurchase their stock and cancel them or keep them as Treasury stock, whereas in the U.K. it was only after December of 2003 that repurchased shares could be treated as Treasury stock. I hypothesise that when more stringent regulations concerning share repurchases are imposed, then the market reaction to share repurchasing announcements will be inversely related. Further, these three countries are a fertile ground for this research in order to help identify if any changes in regulations, under varying cultural and corporate governance backgrounds, are related to share repurchases and the respective market reaction to share repurchase announcements. As well as identifying if common law markets have higher market reaction to share repurchasing announcements than civil law markets.

I would not expect the results obtained from the U.S. to hold as such for the Continental European countries, where stringent regulations are imposed on

repurchases. This argument is supported by Rau and Vermaelen (2002), Oswald and Young (2004) and Lasfer (2005), who report that U.K. firms announcing share repurchases, experience smaller abnormal returns around the announcement date, than those reported in the U.S. market. In addition, in Ginglinger and Hamon (2007) the reported abnormal returns appear to be different and lower than the ones reported in the U.K. studies, suggesting that the markets react differently across countries.

Concerning the regulatory differences among countries, La Porta et al. (1996) and La Porta et al. (1997), show that legislation among countries differs significantly in areas such as shareholder protection, law enforcement and shareholder ownership concentration. From that perspective, Continental Europe countries can be distinguished into three categories. Common law countries, such as the UK, where the level of shareholders' protection is the highest among Europe and firms have on average low levels of ownership concentration. German Civil law and Scandinavian Civil law where the level of protection and ownership concentration is moderate. And finally, French Civil law where, among the three countries of the research sample, the level of shareholder protection is the lowest and the ownership concentration is the highest. Consequently, different levels of shareholder protection and especially ownership concentration, will lead to different levels of information asymmetry in the market as well as different attitudes of shareholder value maximisation. For instance, in France where firms tend to be family owned, and in Germany where firms have higher levels of ownership concentration compared to the U.K., share repurchases would most likely be treated unreceptively. In contrast, in common law countries such as the U.K. and U.S., share repurchases should be more popular due to maximising shareholder value as being a firm's primary goal. This is supported by Brounen et al., (2004), where they find that German and French companies are less interested in maximising shareholder value compared to U.K. firms. Therefore, I expect to find a stronger support for the signalling of undervaluation hypothesis and a higher market reaction in the U.K. than in Germany and France.

In addition, the significance of the effect that different regulatory frameworks can have on share repurchases is highlighted by Ginglinger and Hamon (2007), where they report for a three year period (January 2000 to December 2002), 371 repurchasing firms, relative to the 51 repurchase announcements made in the period 1985 to 1998 (Lasfer, 2005). This was before the stringent regulations concerning share repurchases were relaxed. Until then corporations were to buyback their shares

only in rare circumstances, thus opening the way for corporations to repurchase their shares. Further, Ginglinger and Hamon (2007) report that approximately 40% of Paris-listed firms repurchased their shares during their sample period indicating that many French firms expressed their interest in share repurchasing.

Another important factor, that can have a significant impact on share repurchases is the tax differential between capital gains and personal income tax. Usually share repurchases are taxed as capital gains. Therefore, when capital gains tax rate is lower than the personal income tax rate, share repurchases become more attractive to investors. This is because a share repurchase should be more valuable to shareholders, from a tax perspective, than a dividend pay out (Grullon and Michaely, 2002).

The existing literature seems to disagree on the practical importance of tax considerations for share repurchases. For instance, Bagwell and Shoven (1989) and Dittmar (2000), find no evidence that the tax regulations can have a significant effect on payout policies. Similarly, Oswald and Young (2008) find no evidence that the increased repurchase activity was primarily driven by the tax credits that pension funds could receive from share repurchasing. On the other hand, a number of research studies such as Grullon and Michaely (2002), Lie and Lie (1999) and Rau and Vermaelen (2002) report evidence that taxation is an important drive on firms' payout decision making and when more favourable measures are taken towards share repurchases then both share repurchasing announcements and activity increase.

Further, Lie and Lie (1999) find evidence that shareholder tax implications affect how firms distribute cash to their shareholders. In addition, they report that managers are more sensitive to the shareholders' tax threshold when a large fraction of the shares is owned by institutional investors, because they can be more capable and willing to inform managers about the tax implications of different cash disbursements. Therefore, the choice of distributing excess cash can be more tax sensitive when there is higher ownership concentration due to the pressure that can be applied to managers for considering the tax effect of a cash disbursement. As a consequence, the market reaction to share repurchase announcements will be lower for firms that have high levels of ownership concentration (and vice versa), since the choice to repurchase would be the outcome of their pressure to management to consider the tax implications in the case of an alternative pay out method. Thus, tax

can have a significant effect on the choice to repurchase and on the respective market reaction to such announcements.

Moreover, Keswani et al. (2007), report a dramatic rise in the open market share repurchase activity in the U.K., (196 firms announced their intention to repurchase their shares), for the period April 1999 to December 2002, due to the abolition of advance corporation tax on 5 April, 1999. This is because the abolishment of ACT lifted the tax burden on both dividends and share repurchases, which made these two forms of payout attractive.

Given the flexibility on the timing and execution, as well as the tax advantage of open market share repurchases compared to cash dividends, they can be viewed as substitutes to cash dividends. Grullon and Michaely (2002) find evidence in the U.S. suggesting that share repurchases substitute cash dividends. Furthermore, Skinner (2008) finds that younger firms that have not paid cash dividends are more prone to repurchase their shares instead of committing to pay cash dividends. In addition, he finds that the overall significance of dividend payers in the group of firms that make payouts is diminishing over time, suggesting that share repurchases will become the dominant form of payouts.

However, DeAngelo et al. (2000), Jagannathan et al. (2000, and Dittmar (2000) in the U.S., and Mitchell and Dharmawan (2007) in the Australian market, do not find any evidence that support the notion that repurchases are substitutes of cash dividends. Rather, they find that share repurchases are complements to cash dividends. This is also supported by Jagannathan et al. (2000) who find that firms repurchase their shares, when they experience unexpected earnings, whereas they pay cash dividends from more permanent earnings, hence suggesting that repurchases are complements rather than substitutes of dividends.

For the U.K. I distinguish three tax changes and one regulatory change, thus yielding four time sub-periods for tax change effects and two time sub-periods for regulatory change effects. In detail, the tax changes for the U.K. are the following. First, the abolishment of the advance corporation tax (ACT) which became effective on 1st of April 1998. Prior to the abolishment of ACT, share repurchases were considered as cash distributions and as such they created an ACT charge. When there is no surplus ACT to offset against the additional ACT liability, then share repurchases would create an additional tax liability which made them unattractive to firms. Firms with surplus ACT faced a classical corporate tax system since the

imputation tax rate was reduced to zero (Acker et al., 1997). Therefore, the surplus ACT would be an additional cost bore by both firms and investors in the form of a higher tax rate on distributions. However, Rau and Vermaelen (2002) argue that during the imputation system and ACT, still investors belonging to high tax brackets would prefer open market share repurchases than cash dividends, whereas investors belonging to low tax bracket would prefer cash dividends over share repurchases. Nevertheless, the abolishment of ACT removed the tax disadvantage of share repurchases, thus increasing their popularity as a payout method. Therefore, corporations would be keener on repurchasing their shares which would be reflected on the market's positive reaction on a firm's announcement of intention to repurchase its shares. Second, is the change in the regulation that became effective on 30th of August 2001, where until then funds where taxed when selling their shares back to companies. After that date, funds could be protected from tax claims on share repurchases. Therefore, share repurchases could have a competitive tax advantage over cash dividends.

Following the findings of Rau and Vermaelen (2002) and Lie and Lie (1999) that repurchase activity is influenced by the tax impact of share repurchases on pension funds, I expect to find an increased market reaction on share repurchase announcements since funds could be exempt from tax claims on share repurchases. Third, is the 1st of February 2005 where a payment made by a company on the purchase of its own shares would be subject to income tax, rather than capital gains tax which were taxed at a lower level than the respective level of income tax. Thus, I expect to see a reduction to the market reaction to share repurchases, since the tax benefit of share repurchases for the shareholders would be subsequently diminished.

For regulatory change, I identify for the U.K., the 1st of December 2003 when companies were allowed the choice to keep the repurchased shares as Treasury stock. This gave corporations more flexibility to manage their capital, as well as the ability to use the stock as currency in future acquisitions which they would hope they would struck at a higher price than the level at which they bought the shares. In addition, firms would have the ability to reissue the repurchased shares at a later date, which could have a negative impact on the market reaction to repurchasing announcements. Furthermore, when companies are allowed to keep the repurchased shares as Treasury stock, by repurchasing their shares and re-issuing their stock when they deem it necessary, they can increase the firm's stock liquidity and reduce short-term price

instability, thereby smoothing the price discovery (De Cesari et al., 2008). However, it must be noted that even in the case where U.K. firms would routinely continue to cancel all or at least a portion of the repurchased shares, still. , it is a flexible capital management tool that since the change in regulations is available to firms to make use of.

For France, I distinguish one tax change that could affect the market reaction to the announcement of a share repurchase, thus yielding two time sub-periods. This change became effective on 1st of January 2005, where a considerable reduction on corporation tax by 15% became effective. Since the corporation tax was reduced, all else being equal, firms where able to funnel a larger portion of their earning to potential investment projects, or they could distribute them back to their shareholders through share repurchases. Thus, I expect to see an increase in the market reaction to share repurchase announcements. This is because the market would welcome this extra payment, but more importantly it would welcome the reduction of any potential agency costs that could arise form the available higher free cash flows.

For Germany, I identify one tax change and one regulatory change that could affect share repurchases, thus yielding two pairs of time sub-periods respectively. First, the tax change took place on 1st of January 2001, which was the Tax Reform 2000. Until then, an imputation tax system was in place, whereby the corporate income tax was credited against its shareholders' individual income or corporate income tax. In addition the corporate tax level until then was lower than the personal income tax level. Therefore, since the legalising of share repurchases I expect to see a positive market reaction to share repurchasing announcements that occurred during that period. With the implementation of the Tax Reform 2000 only 50% for both dividends and capital gains received by individual shareholders were taxable. Since the marginal personal tax rate was reduced to 48.5% I would expect to see a decrease in the market reaction to share repurchases, since the tax advantage of share repurchases would be reduced. Finally, the regulatory change occurred on 1st of September 2002, when stricter regulations were imposed on the reporting of share repurchases and especially to open market repurchases, since they were treated as self tender offers to all shareholders, which entailed high costs and considerable administrative effort in a rigid timeline in order to comply with the law requirements. Therefore, this change in regulations takes away the flexibility of share repurchases and imposes a considerable cost on them, which makes share repurchases a more

credible signal to the market due to the costs it bears. As a consequence, I expect to find a higher market reaction to the announcement of intention to repurchase shares in Germany, due to the increased credibility of that signal to the market.

By studying the market reaction to share repurchasing in these predefined time periods, I can identify if any changes in taxation and regulations, concerning share repurchasing, can have a significant effect on the market reaction towards these announcements. Additionally, this research strives to shed light concerning the signalling hypothesis for undervaluation, by delving into three of the largest and most important markets of Continental Europe. Thus, I will be able to test if the main motive for share repurchases is undervaluation and assess whether the respective market reaction is homogeneous across countries, or depends on country specific characteristics. This will be achieved by analysing the abnormal returns before, on and after the announcement of share repurchases in each market.

Further, to the best of my knowledge, the existing literature has not tried so far to identify if there are any differences or variations on the market reaction between firms that announce their intention to repurchase their shares only once or make multiple repurchase announcements through time. Therefore, I analyse the differences in the market reaction between firms that announce a share repurchase only once and firms that make multiple announcements throughout the ten year period under study. I argue that the first announcement contains more information while multiple announcements are already expected by the market, and thus, have less information content. Therefore, I expect to find that firms that make only one share repurchase announcement will have a higher market reaction than firms that made multiple announcements. Moreover, I expect to find that for firms that made multiple announcements, the market reaction to the initial announcement will be higher than to the subsequent announcements, since information content of the initial announcement will be greater than in the following announcements.

This chapter sets out to provide a comprehensive analysis of the market reaction on the announcement of intention to repurchase shares on the open market (not the actual trades) across a number of European countries. This allows me to test whether the proposed hypotheses hold for all three countries of this research or if different factors influence the market reaction in each respective country. Furthermore, I assess in this chapter whether the market has a different reaction between the initial and the subsequent announcements. In addition, it strives to identify any effects that country-

specific regulations might have on share repurchases. This cross-country analysis allows to identify if the favourable market reaction to share repurchase announcements is attributed mostly to the payout mechanism itself. In addition, it allows to identify whether the market reaction is affected by various regulatory and tax regimes, and if changes in taxation and regulations impact the market reaction to share repurchases. Finally, by performing a cross-sectional analysis I identify which are the main aspects that affect the market reaction to repurchasing announcements.

To summarise, the main hypotheses of this research are: (1) The market reaction to share repurchases will differ between the three countries and will be higher in the U.K., due to the different regulatory, cultural and tax regimes; (2) The market reaction will be higher to the initial announcement than the subsequent announcements, because the initial announcement carries more information to the market; (3) The level of ownership concentration will have a significant impact on the market reaction because it will lead to different levels of information asymmetries; (4) When stricter regulations are imposed on share repurchases, the market should have a higher reaction, because then the announcement of a share repurchase can be a more credible signal to the market; (5) When changes in taxation occur, such as the increase of the capital gains tax rate, compared to the personal income tax rate, then the market will have a lower reaction due to the tax disadvantage of share repurchases.

3.3. Data and Methodology

The sample is constructed by identifying all the announcements of intention to repurchase ordinary shares by hand-collected data reported in the news articles posted in *Perfect Analysis* and *Factiva* databases from 1st of January 1997 through 31st of December 2006. The reason for selecting this time period is because it was not until 1998 that share repurchasing was allowed to take place more freely in both Germany and France, thus allowing me to do the cross country analysis between the three different markets. These databases report any news announcements that were available in the press made by U.K. and European corporations on share repurchases. The sample is refined so as to involve solely firms that announce their intention to repurchase ordinary shares, thus excluding announcements concerning the repurchase of B-shares or preference shares. It should be noted that the sample contains solely the announcements of intention to repurchase shares in the open market, either as being

individual announcements or following the general shareholders meeting, though without being contaminated by other news, such as earnings estimates, earnings reporting, etc. Additionally, I control the sample for American Depositary Receipts (ADRs) and for cross-country listings. Moreover, corporations included in the sample are required to have their share prices listed on *DataStream*. The sample contains 970 announcements of intention to repurchase from corporations primarily listed in the United Kingdom (513 announcements), France (263 announcements) and Germany (194 announcements).

For all empirical tests, daily data are employed and logarithmic stock returns are estimated. All time series are checked and adjusted for non-trading days in the sample period. The systematic market risk is measured by the relative general market index of the country where companies are primarily listed.

This chapter aims to uncover significant equity returns during and/or around the announcement period. The methodology proposed by Brown and Warner (1985) is an event study approach and suits the purpose of this research. The standard OLS market model has been employed to derive the abnormal returns. The general form of the OLS market model is as follows:

$$AR_{it} = R_{it} - E(R_{it})$$
(3.1)

AR_{it} = Abnormal return for security i in period t

R_{it} = Actual stock return for security i in period t

$E(R_{it})$ = Expected return for security i in period t

R_{mt} = Actual market return in period t

$$E(R_{it}) = \hat{\alpha}_i + (\hat{\beta}_i * R_{mt}) + \varepsilon_{it}$$
(3.2)

The alphas ($\hat{\alpha}_i$) and betas ($\hat{\beta}$) are the regression coefficient estimates for each firm, and are estimated from an ordinary least squares regression of each security i over the market index with an estimation period of -255 to -21 trading days prior to the repurchase announcement, following Peyer and Vermaelen (2005). The coefficients of the market model are calculated by running a regression of each firm's raw returns against each firm's country main market index.

Following the example of Ikenberry et al. (1995), Peyer and Vermaelen (2005) and Zhang (2005), the abnormal returns are computed over the -20 to +20 days relative to the announcement date. The average abnormal return (AAR) for each time t relative to the event day (day 0), is calculated as the sum of the abnormal returns at time t divided by the number of securities in the sample for each country. The average abnormal returns are mathematically expressed as in equation (3.3).

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \qquad (3.3)$$

The cumulative average abnormal returns are estimated as the sum of the average abnormal returns for all the securities in the sample of each country, over a specified time period. The cumulative average abnormal returns (CAAR) are examined for various intervals within a forty-day period before and after the event date ($t = 0$). Several event windows are analyzed in order to better evaluate the market reaction ex-ante, around, and ex-post the announcement. The cumulative average abnormal returns (CAAR) reflect the total market effect of an event across corporations and across a chosen time interval. The reported results are based on the straightforward market model.

$$CAAR_{(t_1, t_2)} = \sum_{T=t_1}^{t_2} AAR_{it} \qquad (3.4)$$

In order to evaluate the statistical significance of the average abnormal returns (AAR) for each time period t and the cumulative average abnormal return (CAAR) for each time window (t_1, t_2), the null hypothesis is that their respective values are zero. The test statistics for any time period t is the ratio of the average abnormal return (AAR) at the time period t to its estimated standard deviation. The standard deviation is estimated from the time series of the portfolio's average abnormal returns (AAR) over its estimation period. The time series standard deviation test employs a single variance estimate for the portfolio. Hence, it does not account for unequal variances across the portfolio's securities and avoids the potential problem of a cross-sectional

correlation of security returns. Therefore, the mathematical expression of the test statistics for the *AAR* at any time period *t* is as follows.

$$t_{AAR_t} = \frac{AAR_t}{\sigma_{AAR}} \qquad (3.5)$$

where σ_{AAR} is the estimated variance of AAR_t. Furthermore, the test statistics for assessing the statistical significance of the cumulative average abnormal returns over a time window (t_1, t_2), is expressed as follows.

$$t_{CAAR_t} = \frac{CAAR_{(t_1, t_2)}}{\sigma_{CAAR} / \sqrt{T}} \qquad (3.6)$$

where σ_{CAAR} is the estimated variance of $CAAR_{(t_1, t_2)}$ and T is the time window where $T = t_2 - t_1 + 1$. The event study methodology in this context is likely to suffer from the correct definition of the event date. Given that the data is collected from financial publications as reported by *Factiva*, it is difficult to identify the exact date that the announcement event took place. The reason for this is that there is no established database that records the exact date and the targeted amount to be repurchased. Further in some countries such as France, companies are not obliged to announce publicly their intention to repurchase their shares, since they only have to get authorisation from the AMF (*Autorité des marchés financiers*[10]) in order to initiate the open market share repurchase. Therefore, for France I only include in the sample the announcements of intention to repurchase shares that were publicly disclosed voluntarily. Additionally, in order to overcome the drawback of identifying the exact date of the announcement and capturing the announcement effect for the three countries under study, following Ikenberry et al. (1995) results on the expanded event periods [-2, +2] and [-1, +1] are reported.

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[10] The *Autorité des marchés financiers* (AMF) is France's financial regulatory system.

3.4. Descriptive Statistics

Table 3.1 reports the descriptive statistics concerning the annual average abnormal performance for each of the three countries of the sample, as well as the annual number of announcements to repurchase own shares. The vast majority of these announcements took place in the U.K. (562 announcements representing approximately 54% of the total). Rau and Vermaelen (2002) use a sample of 264 firms in the U.K. for the period starting in January 1985 to January 1998 and Keswani et al. (2007) use a sample of 196 firms in the U.K. for the period starting in April 1999 to December 2002. Oswald and Young (2004) report a sample of 268 announcements of intention to repurchase shares in the open market, as reported in the Financial Times and the Regulatory News Service (RNS) during the period 1995 to 2000.

Moreover, Lasfer (2005) reports a sample of 465 repurchasing firms in the U.K. and 51 firms in France for the period 1985 to 1998. Furthermore, in France, Ginglinger and Hamon (2007) and Ginglinger and L'Her (2006) use a sample of 337 firms (January 2000 to December 2002) and 381 (July 1998 to July 1999) respectively. Therefore, it is clear that in this more recent time period there has been an increasing trend in the number of firms that announce their intention to repurchase their shares. A better illustration of the number of open market share repurchase announcements is displayed in Figure 3.1.

In the U.K., the majority of the announcements took place in 2005 (approximately 16%) where they peaked, with a small decrease in the following year. In France, there is a steady increase for the two years after share repurchasing was made easier for firms to undertake, and it reaches its peak in 2000. Afterwards, the number of announcements seems to have a certain level of volatility but it seems to have a large increase in repurchasing announcements in 2006. Lastly, in Germany, the number of announcements of intention to repurchase shares follows a similar pattern with France and peaks in 2000. The large increase of repurchase announcements in France and Germany can be attributed to the regulatory amendments, which allowed corporations to engage in such practices. This illustrates the important effect that regulations can have on payout policies.

Figure 3.1 Share Repurchase Announcements.
This figure illustrates the annual number of share repurchase announcements for each country.

Share Repurchase Announcements
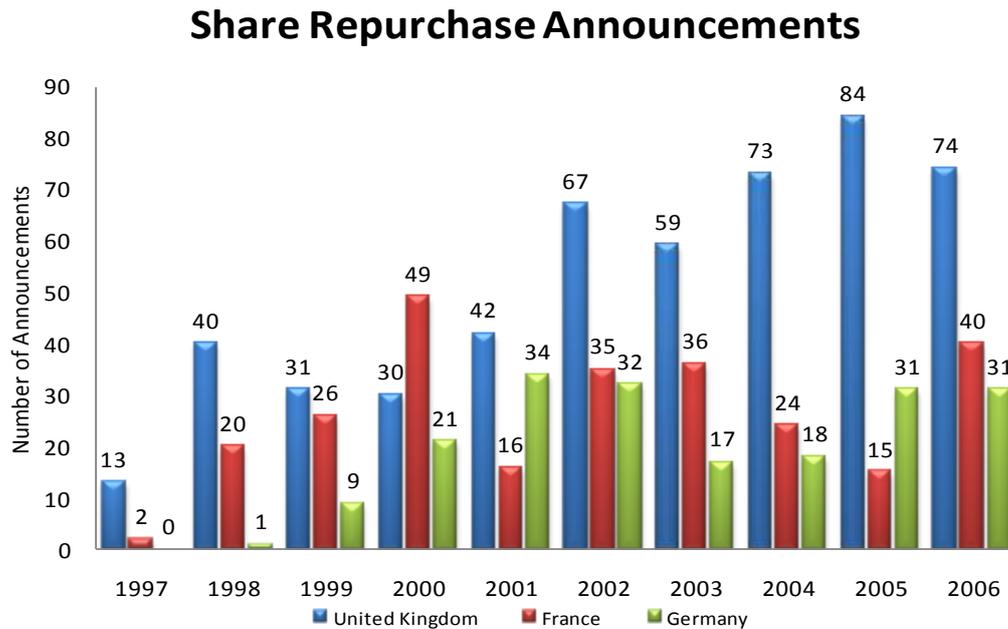
Furthermore, Table 3.1 reports the yearly average market reaction for each country and shows that in Germany and in the United Kingdom (to a certain extent) there is an increasing trend on the average market reaction at the time of the share repurchase announcement which declines from 2004 and onwards, whereas in France The average market reaction is volatile throughout the years without depicting any distinguishable trends.

Table 3.2 reports the time gap between the initial and the subsequent announcements of intention to repurchase shares in the open market. The table shows that in all three countries, the time lapse between the initial and the subsequent announcements for almost half of the samples is less than a year, and the overwhelming majority is less than 3 years. Even by following Ikenberry et al. (1995) and apply a cut-off point of three years as a time gap for a subsequent announcement to be identified as such, the remaining announcements that are still identified as subsequent announcements compared to the overall sample in this study are significantly small to have any significant impact that would distort the findings of this research. However, it must be acknowledged that a small sample of subsequent announcements take place after 3 years or more following the initial announcement of intention to repurchase shares in the open market and therefore one be cautious when interpreting these results.

Table 3.1 Annual average market reaction to share repurchase announcements.

The sample consists of 970 announcements of intention to repurchase shares on the open market from 1997 to 2006, of which 513 took place in the U.K., 263 in France and the remaining 194 in Germany. The abnormal returns are calculated with the implementation of the market model, with the coefficients computed over the -255 to -21 days before the announcement date. This table reports the annual cumulative average abnormal returns for each country for the three days surrounding the announcement day (time window -1 to +1). The t-statistics, percentage of positive abnormal returns and the number of events are reported in parentheses for each year. [***], [**], and [*] reported on the average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	N
United Kingdom	2.27%***	3.15%***	2.03%***	2.03%***	1.56%***	2.76%***	3.34%***	1.47%***	-0.45%***	0.90%***	
	(6.983, 69%,13)	(9.907, 80%,40)	(7.591, 65%,31)	(9.555, 73%,30)	(9.498, 67%,42)	(18.636, 67%,67)	(22.146, 68%,59)	(11.027, 63%,73)	(-2.017, 48%,84)	(5.621, 57%,74)	513
France	-3.80%	2.47%***	-1.36%***	0.30%	1.94%***	0.69%**	1.72%***	0.36%	-0.29%	1.27%***	
	(-7.374, 50%,2)	(9.334, 55%,20)	(-4.693, 42%,26)	(1.222, 47%,49)	(5.218, 63%,16)	(1.960, 49%,35)	(4.705, 67%,36)	(1.361, 54%,24)	(-1.325, 33%,15)	(5.242, 70%,40)	263
Germany		1.58%	1.78%***	3.48%***	3.91%***	2.82%***	3.22%***	0.81%***	1.22%***	0.85%***	
		(1.702, 100%,1)	(3.752, 78%,9)	(9.851, 57%,21)	(7.663, 56%,34)	(9.308, 63%,32)	(7.196, 59%,17)	(2.568, 44%,18)	(5.325, 71%,31)	(3.614, 48%,31)	194
N	15	61	66	100	92	134	112	115	130	145	**970**

Table 3.2 Time-lapse of subsequent open market share repurchase announcements.
This table reports the descriptive statistics on the time that lapses between the initial and the subsequent of the subsequent announcements from a sample of 211, 79 and 66 subsequent announcements made in the United Kingdom, France and Germany respectively. The total sample of announcements (including those firms that made only one announcement) is 513, 263 and 194 for the United Kingdom, France and Germany respectively.

Time period	#	UK Percentage relative to total subsequent announcements	Percentage relative to total sample size	#	FR Percentage relative to total subsequent announcements	Percentage relative to total sample size	#	GE Percentage relative to total subsequent announcements	Percentage relative to total sample size
<1 yr	153	70.18%	29.82%	36	46.15%	13.69%	41	63.08%	21.13%
1 yr	32	14.68%	6.24%	14	17.95%	5.32%	15	23.08%	7.73%
2 yr	14	6.42%	2.73%	8	8.97%	2.66%	4	6.15%	2.06%
3 yr	8	3.67%	1.56%	8	10.26%	3.04%	2	1.54%	0.52%
4 yr	2	0.92%	0.39%	11	14.10%	4.18%	2	3.08%	1.03%
5 yr	1	1.83%	0.78%	0	0.00%	0.00%	2	3.08%	1.03%
6 yr	1	1.38%	0.58%	2	2.56%	0.76%	0	0.00%	0.00%
Total	211	100%	42.50%	79	100%	29.66%	66	100%	33.51%

3.5. Empirical Evidence

3.5.1. Market reaction to the announcement of intention to repurchase.

Table 3.3 reports the Average Abnormal Returns (AARs) estimated for each country, for the ten year period under study. These results provide a broad illustration of the overall market reaction to open market share repurchase announcements. For days -20 to -2, henceforth referred to as pre-event period, the results on the AARs for the U.K. firms remain marginally positive, whereas for the French and German firms the results are close to zero, and mostly negative, particularly for Germany. On the announcement day (day 0), I find a high market reaction of 1.98% and 1.05% in Germany and U.K. respectively, which are statistically significant at the one percent confidence level and statistically different between them as well as from the market reaction in France. On the remaining part of the 41-day time window, days +2 to +20, for France the market does not have a favourable reaction towards repurchasing announcements, since after a few days the cumulative average abnormal returns bounce back to the negative side. In contrast, in Germany and especially in the U.K. there is a considerable increase in excess performance.

The findings from the preliminary analysis of the daily excess returns do not provide strong support for the undervaluation hypothesis so far. Even though the excess returns prior to the repurchase announcement are negative or marginally different from zero, still they are not statistically significant. It is only during the days of the announcement that the market has a positive and statistically significant reaction, suggesting that share repurchases are perceived to be good news. In addition, I find that in France the market reaction to the repurchase announcement on the day which the announcement took place, is significantly low and particularly so when compared to the respective market reaction in the U.K. and Germany. Further, I split the samples between the initial and subsequent announcements. Hence, I can assess whether the market has a different reaction towards firms that made repurchasing announcements only once, and those that made multiple announcements through time. The results are reported in Table 3.4. I find that for all three countries under study, the market has a more favourable reaction on the first repurchase announcement made by a firm, rather on the subsequent ones. In detail, for all three countries, the AARs for the initial announcements are approximately double, compared to the ones from the subsequent announcements.

Table 3.3 Average abnormal returns per country.

The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the U.K., 263 in France and the remaining 194 in Germany. The abnormal returns are calculated with the implementation of the ordinary least squares market model with the coefficients computed over the -255 to -21 days before the announcement date, for the time period 1997 to 2006. The table reports the average abnormal returns for the forty days surrounding the announcement day of intention to repurchase shares from day -20 to day +20. ***, **, and * reported on the average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively. [a], [b], and [c] report the statistically significant difference in means for the average abnormal returns for the pairs U.K.-France ([a]), U.K.-Germany ([b]) and Germany-France ([c]) respectively at the 10% confidence level.

	Average Abnormal Returns		
Day	U.K.	France	Germany
-20	0.10%	0.09%	-0.14%
-19	-0.03%	-0.13%	-0.05%
-18	0.01%	-0.13%	-0.23%
-17	0.03%	0.04%	0.25%
-16	0.05%	-0.02%	-0.01%
-15	[a, b]0.22%*	[a]-0.32%*	[b]-0.33%
-14	0.02%	0.03%	0.01%
-13	-0.06%	0.11%	-0.20%
-12	-0.02%	-0.13%	0.18%
-11	-0.03%	0.00%	-0.08%
-10	-0.08%	0.16%	-0.27%
-9	-0.04%	0.06%	-0.07%
-8	0.00%	-0.03%	-0.24%
-7	0.02%	-0.14%	0.03%
-6	-0.06%	0.02%	-0.32%
-5	0.01%	0.02%	0.17%
-4	-0.01%	0.06%	0.08%
-3	0.07%	-0.10%	0.01%
-2	-0.06%	-0.08%	-0.19%
-1	[b]0.40%***	0.24%	[b]0.00%
0	[a, b, c]1.05%***	[a]0.10%	[b, c]1.98%***
1	0.24%***	0.40%**	0.34%
2	0.17%	0.24%	0.15%
3	0.16%	-0.16%	0.18%
4	-0.08%	0.20%	0.01%
5	0.00%	0.08%	0.18%
6	[a]0.09%	[a]-0.44%**	-0.09%
7	0.09%	0.04%	0.14%
8	0.09%	-0.03%	0.02%
9	0.06%	0.03%	0.09%
10	[a, c]0.05%	[a]-0.45%**	[c]0.25%
11	-0.05%	-0.02%	-0.40%
12	0.06%	-0.03%	0.05%
13	[a]0.04%	[a]-0.31%*	-0.15%
14	0.06%	-0.03%	0.24%
15	[a]0.06%	[a]0.39%**	0.36%
16	[b]0.17%	0.10%	[b]-0.51%*
17	-0.11%	-0.11%	-0.12%
18	0.04%	-0.09%	-0.20%
19	-0.05%	-0.06%	-0.30%
20	0.06%	-0.05%	0.21%

Especially in Germany and in the U.K., on day 0 of the announcement, the AARs of the initial announcements amount to 2.49% and 1.43% respectively, compared to 1.12% and 0.64% of the subsequent announcements. Further, the AARs for U.K. and Germany for both the initial and subsequent announcements are statistically significant at the 1% confidence level and statistically different from each other. Surprisingly, in France on day 0 the AAR for the initial announcements is -0.11%, but not statistically significant. The market seems to have a somewhat delayed reaction to such news since it is on the first day after the announcement that there is a significant and positive AAR of 0.57%, whereas for the subsequent announcements the AARs amount to 0.63% (which is statistically significant) and -0.08% (which is not statistically significant), for days 0 and 1 respectively.

Hence, the preliminary results, from splitting the sample of repurchase announcements between the initial and the subsequent announcements, show that the market has a higher reaction to firms that make only one as opposed to multiple share repurchase announcements. This finding is further investigated in order to identify the reasons for the difference in the market reaction.

One should bear in mind however, that the AARs can only be looked at as indications so far. In order to have a more robust view, I estimate and assess below the Cumulative Average Abnormal Returns (henceforth referred to as CAARs), for the pre-event, event and post-event periods. The pre-event time windows I use are [-20 to -3] and [-20 to -2]. The event time windows are [-2 to +2], [-1 to +1] and day 0, while the post-event windows are [+2 to +20] and [+3 to +20].

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Table 3.4 Average abnormal returns for initial and subsequent announcements in each country.

The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the U.K., 263 in France and the remaining 194 in Germany. The abnormal returns are calculated with the implementation of the ordinary least squares market model with the coefficients computed over the -255 to -21 days before the announcement date. The table reports the average abnormal returns for selected time-windows, for the two sub-groups of subsequent and initial announcements for the time period 1997 to 2006. Subsequent announcements are defined as the announcements succeeding the initial announcement that took place throughout the ten year period of this study. Initial announcements are defined as those announcements that appear for the first time in the sample through the ten year period of this study. ***, **, and * reported on the average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively. [a], [b], and [c] report the statistically significant difference in means for the average abnormal returns for the pairs U.K.-France ([a]), U.K.-Germany ([b]) and Germany-France ([c]) respectively for the initial announcements group, and the [a'], [b'] and [c'] for the same pairs of the subsequent announcements group at the 10% confidence level.

	Average Abnormal Returns					
	U.K.		France		Germany	
N	*302*	*211*	*184*	*79*	*128*	*66*
Day	*Initials*	*Subsequent*	*Initials*	*Subsequent*	*Initials*	*Subsequent*
-20	0.26%	-0.12%	-0.01%	0.28%	-0.18%	-0.06%
-19	-0.04%	-0.04%	-0.28%	0.22%	-0.17%	0.20%
-18	0.12%	-0.30%***	-0.01%	-0.42%*	-0.29%	-0.09%
-17	0.10%	-0.07%	0.10%	-0.05%	0.38%	-0.04%
-16	0.02%	[a']-0.02%	-0.23%	[a']0.43%*	-0.09%	0.07%
-15	[a,b]0.29%*	0.09%	[a]-0.32%	-0.31%	[b]-0.50%	0.00%
-14	-0.03%	0.01%	0.03%	0.02%	0.00%	0.06%
-13	-0.07%	-0.17%	0.31%	-0.35%	-0.04%	-0.51%*
-12	-0.11%	0.16%	-0.20%	0.08%	0.12%	0.30%
-11	-0.02%	-0.05%	-0.02%	0.01%	0.05%	-0.39%
-10	-0.21%	0.12%	0.08%	0.39%	-0.36%	-0.08%
-9	0.02%	-0.08%	0.15%	-0.19%	-0.05%	-0.18%
-8	0.01%	-0.09%	0.00%	-0.12%	-0.26%	-0.15%
-7	-0.13%	0.13%	-0.22%	0.00%	-0.10%	0.37%
-6	0.06%	[a']-0.22%***	-0.05%	[a']0.21%	-0.29%	-0.33%
-5	0.02%	-0.01%	0.02%	0.11%	0.11%	0.28%
-4	-0.05%	0.00%	0.07%	0.10%	0.13%	-0.13%
-3	0.16%	0.00%	-0.14%	-0.03%	0.13%	0.02%
-2	-0.09%	-0.03%	-0.02%	-0.27%	-0.12%	-0.46%
-1	0.54%***	0.16%	0.28%	0.23%	0.08%	-0.09%
0	[a,b]1.43%***	0.64%***	[a,c]-0.11%	0.63%***	[b,c]2.49%***	1.12%***
1	0.37%***	0.22%*	0.57%***	0.08%	0.51%	-0.12%
2	0.26%	-0.02%	0.33%	-0.15%	0.14%	0.25%
3	0.20%	0.11%	-0.29%	0.17%	0.22%	-0.08%
4	-0.12%	[a']-0.07%	0.06%	[a']0.59%***	0.11%	-0.14%
5	0.16%	-0.21%*	0.12%	0.09%	0.22%	0.29%
6	[a]0.28%*	-0.20%	[a]-0.46%**	-0.32%	0.11%	-0.48%
7	0.10%	0.03%	0.13%	-0.17%	0.26%	-0.13%
8	0.09%	0.00%	0.01%	-0.19%	-0.07%	0.05%
9	0.09%	-0.03%	0.07%	-0.03%	0.11%	0.19%
10	[a]0.08%	0.16%	[a,c]-0.47%**	-0.33%	[c]0.27%	0.16%
11	-0.09%	0.00%	-0.10%	0.17%	-0.56%*	-0.12%
12	-0.03%	0.13%	0.05%	-0.01%	0.12%	-0.18%
13	0.17%	-0.14%	-0.42%*	-0.08%	-0.42%	0.30%
14	0.07%	0.02%	-0.08%	-0.02%	0.24%	0.20%
15	0.04%	0.07%	0.41%*	0.40%	0.29%	0.48%
16	0.17%	0.07%	0.07%	0.18%	-0.54%*	-0.47%
17	-0.23%	0.11%	-0.20%	0.14%	-0.32%	0.34%
18	0.07%	-0.02%	-0.14%	-0.03%	-0.11%	-0.37%
19	-0.02%	0.02%	-0.06%	-0.19%	-0.47%	0.02%
20	0.01%	0.14%	-0.09%	0.03%	0.41%	-0.14%

Table 3.5 reports the CAARs for the entire sample from each country as well as the respective CAARs for the initial and subsequent announcement sub-samples. For now though, I focus on the results for the entire sample from each country. For the pre-event period it can be seen that except for the U.K. where the CAARs are positive but marginally different from zero, for France and Germany the respective CAARs are negative. However, the CAARs for the pre-event period for none of the three countries are statistically significant. In detail, for the time window [-20, -3], I report a CAAR for the U.K. of 0.19% (but not statistically significant), where the CAAR reported in Lasfer (2005) for the same time window amounts to -0.31% (but not statistically significant). Additionally, the results seem to be different from Ikenberry et al. (1995), where the reported findings for the same time where amount to -3.07% (which are statistically significant). For the same time period, France seems to has a negative CAAR of -0.44%, which is consistent with my expectations, but not statistically significant, whereas firms in Germany for the same period seem to have an even poorer performance of -1.23%, but it is also statistically insignificant. Similarly, for the time window [-20, -2], the performance for the repurchasing firms in France and Germany remains negative, where in contrast, in the U.K. remains positive. It should be noted, that the CAARs reported for the time window [-20, -2] for the three countries of this research are not statistically significant.

For the event time window [-2, +2], there is a considerable improvement in performance, since the CAARs for the U.K. and Germany are positive and amount to 1.79% and 2.28% respectively, whereas in France there is a smaller market reaction of 0.84% (which are statistically significant). The results from the U.K. and especially from Germany are in line with those reported in other research studies, for the same time window such as in Ikenberry at al. (1995), where a market reaction of 3.54% in the U.S is reported. Rau and Vermaelen (2002) report a reaction of 1.08% in the U.K., and Lasfer (2005) similarly reports an announcement reaction of 1.64% for the U.K. and 1.06% for Continental Europe. Additionally, Ikenberry et al. (2000) report a market reaction for the five days surrounding the announcement of 0.93% for the Canadian market. Further, the results reported for the French market seem to be more aligned with Ginglinger and L'Her (2006), since they report a market reaction in France of approximately 0.55%.

For the alternative event time window [-1, +1], there is no significant change in the results (U.K. 1.68%; France 0.65%; and Germany 2.32%). The results for the

event window [-1, +1], seem to follow Li and McNally (1999) where a CAAR of 0.87% is reported in Canada, Ginglinger and L'Her (2006) who report a CAAR of 0.55% in France and finally, Oswald and Young (2004) who report a CAAR of 1.24% in the U.K. The market reaction in the U.K. and Germany for the three days surrounding the announcement is in line with the results reported in Peyer and Vermaelen (2005) and Grullon and Michaely (2002)[11].

For the post event period, in the case of the time period [+2, +20] the CAAR reported for the U.K., remains positive (0.91%) and statistically significant at the ten percent confidence level. In France and Germany, contrary to my expectations, for the same time window, the CAARs are marginally different from zero (-0.8% and 0.09% respectively) but are not statistically significant. For the post-event window of [+3, +20] even though the results do not change significantly, the CAARs for none of the three countries are statistically significant. The post-event results from the U.K. are in line with the ones reported in Lasfer (2005) where the market reaction reported for the U.K. is 1.12% and for Continental Europe 0.62%, and Ikenberry at al. (1995) where it is reported for the post event time window [+3, +10] a CAAR of 0.91% for the U.S. market. The market reaction to share repurchase announcements for all three countries can be better portrayed in Figure 3.2.

The results for all three countries, do not provide sufficient evidence in support of the undervaluation hypothesis, since the pre-event period excess performance, even though it is marginally different from zero in the U.K. and negative in France and Germany, it is not statistically significant. Nevertheless, I find strong evidence that the market has a strong and positive reaction to repurchase announcements, especially in the U.K. and Germany. Hence, this suggests that the market reacts positively to such news, for reasons other than potential undervaluation, such as the prospect of reducing potentially arising agency costs. This is also supported by the fact that the respective price performance remains positive, suggesting that the market reaction to repurchase announcement, was not an unjustified over-reaction.

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[11] For the time period [-1, +1], Peyer and Vermaelen (2005) and Grullon and Michaely (2002) report a statistically significant CAAR of 1.81% and 2.57% respectively.

Table 3.5 Cumulative average abnormal results for selected event windows.

The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the U.K., 263 in France, and the remaining 194 in Germany. The abnormal returns are calculated with the implementation of the ordinary least squares market model with the coefficients computed over the -255 to -21 days before the announcement date. The table reports the cumulative average abnormal returns for selected time-windows, for the entire sample and the two sub-groups of initial and subsequent announcements, for the time period 1997 to 2006. Initial announcements are defined as those announcements that appear for the first time in the sample through the ten year period of this study. Subsequent announcements are defined as the announcements succeeding the initial announcement that took place through the ten year period of this study. The t-statistics of the differences in means between the two samples, initial and subsequent announcements, are reported in parentheses. ***, **, and * reported on the cumulative average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively. [a], [b], and [c] report the statistically significant difference in means for the average abnormal returns for the pairs U.K.-France ([a]), U.K.-Germany ([b]) and Germany-France ([c]) respectively for each of the three sample groups (Entire sample, Initials and Subsequent) at the 10% confidence level.

Cumulative Average Abnormal Returns

	United Kingdom			France			Germany		
	Entire Sample	*Initials*	*Subsequent*	*Entire Sample*	*Initials*	*Subsequent*	*Entire Sample*	*Initials*	*Subsequent*
N	513	302	211	263	184	79	194	128	66
CAAR -20,-3	0.19%	0.39%	-0.66%	-0.44%	-0.70%	0.37%	-1.23%	-1.40%	-0.67%
			(-1.287)			*(0.779)*			*(0.497)*
CAAR -20,-2	[b]0.13%	0.29%	-0.68%	-0.51%	-0.72%	0.10%	[b]-1.42%	-1.51%	-1.13%
			(-1.235)			*(0.574)*			*(0.261)*
CAAR -2,+2	[a]1.79%***	[a]2.50%***	0.98%***	[a,c]0.84%**	[a,c]1.05%**	0.52%	[c]2.28%***	[c]3.09%***	0.69%
			(-3.057)			*(-0.778)*			*(-1.993)*
CAAR -1,+1	[a]1.69%***	[a]2.34%***	1.02%***	[a,c]0.66%**	[a,c]0.74%**	0.94%*	[c]2.32%***	[c]3.07%***	0.90%
			(-2.777)			*(0.358)*			*(-2.070)*
CAAR DAY 0	[a,b]1.05%***	[a,b]1.43%***	0.64%**	[a,c]0.05%	[a,c]-0.11%	0.63%*	[b,c]1.98%	[b,c]2.49%***	1.12%
			(-2.174)			*(2.141)*			*(-1.602)*
CAAR +2,+20	[a]0.91%*	[a]1.32%**	0.16%	[a]-0.80%	[a]-1.06%	0.25%	0.09%	-0.01%	0.18%
			(-1.668)			*(1.185)*			*(0.082)*
CAAR +3,+20	[a]0.74%	[a]1.06%*	0.18%	[a]-1.05%	[a]-1.39%*	0.39%	-0.06%	-0.14%	-0.07%
			(-1.325)			*(1.663)*			*(0.032)*

Figure 3.2 CAARs for Entire Sample.

This graph illustrates the cumulative average abnormal returns for the forty-day period surrounding the announcement date [-20 to +20]. The respective pattern emerges from companies in the United Kingdom, France and Germany from the entire sample of announcements of intention to repurchase their shares in the open market through the ten year period under study.
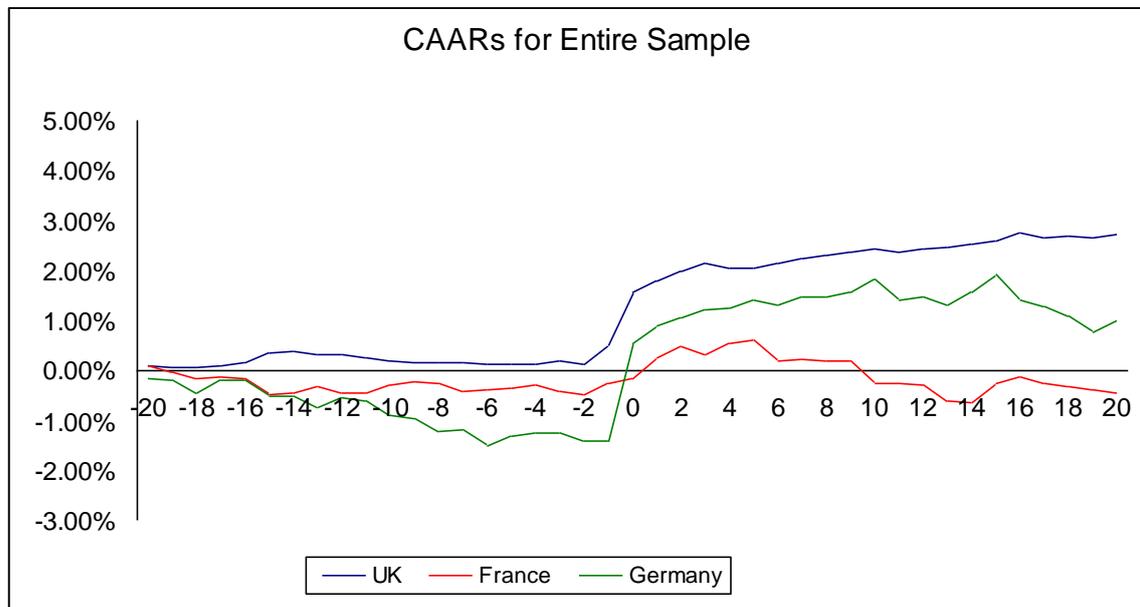
In contrast, in France, the performance of the repurchasing firms has only a very small improvement on the announcement, which is short lived since after a few days the market readjusts and firms return to a negative performance. Nevertheless, the findings in the French market are consistent with the existing literature.

3.5.2. Market reaction to the Initial & Subsequent announcements.

As previously argued, it is possible that by splitting the sample of announcements into two sub-groups between initial and subsequent announcements, I could get more robust results on the market reaction to share repurchase announcements. Additionally, it will help us understand if it is only the initial announcement that is looked upon favourably by the market, and whether the market becomes accustomed to such a pay out method, hence resulting to a smaller reaction on a firm's share price performance.

Table 3.5 additionally reports the CAARs for each sub-group from each of the three countries under study. For the case of the U.K., the initial announcements group shows a better performance compared to the subsequent announcements group through all the pre-, event, and post-event periods. In detail, for the event period [-1, +1] I find that for the initial announcements, the market reaction is more than double compared to the market reaction to subsequent announcements, since the CAARs for the initial and subsequent announcements are 2.34% and 1.02% respectively.

In the case of France, for the initial announcements sample, the excess returns prior to the announcement are negative, but not statistically significant. On the announcement event windows, I find that the market reaction to the initial, and the subsequent announcements is not significantly different, apart from the day of the announcement (day 0), where the excess returns between the two samples are significantly different. Furthermore, I find that for the initial announcements, the market readjusts on the post event period, where the excess returns are estimated to be -1.39% and statistically significant. This evidence suggests that the market overreacts to the repurchase announcement, and subsequently corrects itself.

In Germany, the market has a similar reaction to the initial and subsequent announcements. The market reaction to both types of announcements show signs in support of the undervaluation hypothesis. But there is a correction in the post-event period since the abnormal performance is slightly negative or marginally higher than zero for both sub-groups (but not statistically significant). What is quite notable though, is the difference in the magnitude of the market reaction between the initial and the subsequent announcements. Specifically, for the three days surrounding the announcement, the abnormal performance from the initial announcements is quite high (3.09%), which is also similar to the average abnormal performance reported in the U.S. studies. In contrast, for the subsequent announcements, the abnormal performance is considerably lower (0.90%) compared to the initial announcements.

More importantly, in the event day and event period, which shows the magnitude of the market reaction towards the repurchasing announcement, there is a significant difference in the CAARs of each event window, for all three countries under study. The difference in the market reaction to the initial and the subsequent announcements supports the hypothesis that the market has a more favourable view on the first announcement made by repurchasing firms.

In addition, the results in Table 3.5 show that the mean market reaction for the initial and the subsequent announcements in the U.K. and Germany is significantly different for the event period. Moreover, when testing for the differences in means across countries, I find significant differences even though the market reaction is positive for all three countries. The reaction in France appears to be significantly lower than the respective reactions in the U.K. and Germany. The differences in the market reaction to the first and subsequent announcements, between the three countries are clearly seen in Figure 3.3.

Figure 3.3 CAARs for Initial and Subsequent Announcements.

The graph illustrates the cumulative average abnormal returns for the forty-day period surrounding the announcement date [-20 to +20]. The respective pattern emerges from the two sub groups of the initial and the subsequent announcements of intention to repurchase shares in the open market, made by companies in the United Kingdom, France and Germany through the ten year period under study.
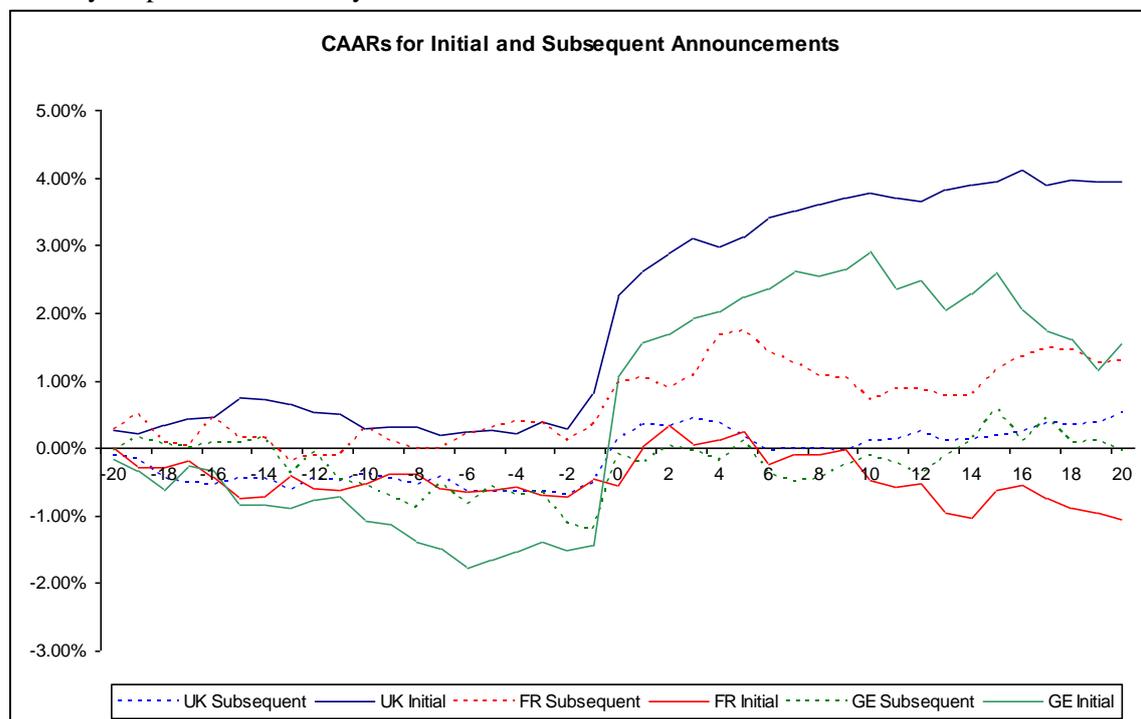
The market reaction to the initial announcements during the post event period is quite puzzling. In the U.K., as expected, the market reaction for the initial announcements is higher than for subsequent announcements. However, the opposite holds for Germany and France. The post event market reaction to the initial announcement for these two countries is poorer than for the subsequent

announcements. This is contrary to my expectations of a higher market reaction to the initial announcement than the subsequent announcements. This is because the French and German markets show a quick share price correction. On the contrary, the U.K. market seems to have a longer term expectation of an improved future performance, since it carries on having a favourable reaction towards the repurchasing firms, and especially on the initial announcements.

In sum, the evidence I get so far, when splitting the sample of announcements from each country under investigation into two sub-groups, between initial and subsequent announcements, do not provide a strong support for the undervaluation hypothesis, and especially in the case of the subsequent announcements. In these cases, even though there is a considerable improvement on the announcement period, it seems that their respective performance drops on the following days. Concluding, when comparing the results between these two groups, I find strong support for the notion that it is the initial announcement of intention to repurchase that contains more information than the subsequent announcements, which is reflected by the high and positive market reaction.

3.5.3. The effects of Regulatory and Tax changes.

In order to fully understand the magnitude of the market's reaction to share repurchase announcements, apart from performing a cross country analysis and comparing the results that each country provides, it would be beneficial to perform an analysis that would test if any regulatory or tax changes, that could affect share repurchases, have any effect on the market reaction. I argue that the reason for this, is that the market can have a different perception of the news and the underlying signals that such a repurchasing announcement can have, which would accordingly lead to various levels of reaction on behalf of the market. For all three countries, I identify certain tax changes that could affect share repurchases and the respective market reaction, but it is only for the U.K. and Germany that I have identified changes in regulations concerning share repurchases.

Table 3.6 reports the pre-, event, and post-event CAARs during each sub-period where a tax or regulatory change has been identified, for all three countries under study. Panel A reports the CAARs during each sub-period, and Panel B reports the matrix containing the differences in CAARs between every sub-period for each country. The results show that there is a clear improvement of performance on the

event period which carries on during the post-event period. A minor exception could be sub-period (3) from the tax changes, where the pre- and post event-performance are similar. Nevertheless, there is a significant market reaction on the three days surrounding the announcement. Similarly in Germany, there is a considerably poor performance on the pre-event period, especially during the sub-periods (1) and (2), which are followed by a significant improvement on the event period. Further, the improved performance carries on, except for the sub-periods (2) and (1) from the tax and regulatory changes respectively. The evidence from France point to the notion that the market has a positive reaction to the announcement of share repurchases. However, during the post-event period, the market quickly corrects itself, suggesting that the market overreact on the open market share repurchase announcement.

The results during the event window show that the market reaction is more than 2% through the first three time sub-periods, which significantly declines after the change in taxation, where share repurchases are subject to income tax. The fact that open market share repurchases lost their competitive tax advantage over cash dividends is reflected on the significant decline of the market reaction. Therefore, I find that certain tax changes, and in particular when share repurchases are subject to income tax, have a significant impact on the market reaction to open market share repurchase announcements.

For the post-event period, there are no significant differences between the various time sub-periods. When testing for the effect of the regulatory change on share repurchases in the U.K., I find that the market reaction is diminished after the change became effective, since the market reaction has decreased from 2.52% to 0.6%, which is a significant reduction, which is also statistically different. This can be translated to the fact that by allowing firms to keep the repurchased shares as Treasury Stock, it made the market to take a more cautious stance on the announcement of share repurchases. Overall, the results from the U.K. show a strong support for the hypothesis that regulatory and tax changes that occurred during the sample period, have a significant effect on the market's perception and interpretation of share repurchasing news announcements.

Table 3.6 Impact of regulatory and tax changes on the market reaction to the announcement of intention to repurchase ordinary shares.

The sample consists of 970 announcements of intention to repurchase shares on the open market from 1997 to 2006, of which 513 took place in the U.K., 263 in France and the remaining 194 in Germany. The abnormal returns are calculated with the implementation of the market model with the coefficients computed over the -255 to -21 days before the announcement date. Panel A reports the mean cumulative abnormal returns for selected time-windows. Panel B reports the matrix containing the differences in CAARs between every sub-period for each country. The number of observations for each sub-period is in brackets. ***, **, and * reported on the average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively. The p-values of the differences in mean market reaction between each sub-period are reported in parentheses in Panel B. Tax changes time sub-periods: (a) U.K.. After 31/3/1998 the abolishment of advance corporation tax and a reduction of corporate tax became effective. After 29/8/2001 mutual funds could have tax credits on share repurchases. After 31/1/2005 share repurchases were subject to income tax. (b) France. After 31/12/2004 large corporate and income tax cuts took place. (c) Germany. After 31/12/2000 a reduction of income and capital gains tax became effective. Regulatory changes time sub-periods: (a) U.K.. After 31/11/2003 repurchased shares were allowed to be treated as Treasury stock. (b) Germany. After 1/9/2002 stricter regulations concerning share repurchases became effective.

Panel A. Impact of Regulatory and Tax Changes per Country

Time Periods	-20 to -2	-1 to +1	+2 to +20
United Kingdom			
Tax Changes			
01/01/1997 to 31/03/1998 [56] (1)	-0.16%	2.52%***	0.47%
(Abolishment of ACT)			
01/04/1998 to 29/08/2001 [95] (2)	-0.79%	2.23%***	0.69%
(Tax credits on Mutual Funds)			
30/08/2001 to 31/01/2005 [213] (3)	1.07%	2.29%***	1.27%**
(Repurchases subject to income tax)			
01/02/2005 to 31/12/2006 [149] (4)	-0.73%	0.14%*	0.63%
χ^2 **(4)**	*0.268*	*0.739*	*0.077*
Regulatory Changes			
01/01/1997 to 31/11/2003 [275] (1)	0.42%	2.52%***	1.14%*
(Repurchased shares kept as Treasury)			
01/12/2003 to 31/12/2006 [238] (2)	-0.33%	0.60%***	0.59%
χ^2 **(2)**	*0.031*	*0.659*	*0.195*
France			
Tax Changes			
01/01/1997 to 31/12/2004 [208] (1)	-0.82%	0.62%**	-0.30%
(Large corporate and income tax cuts)			
01/01/2005 to 31/12/2006 [55] (2)	-0.71%	1.32%***	-1.11%
χ^2 **(2)**	*0.016*	*0.029*	*0.206*
Germany			
Tax Changes			
01/01/1997 to 31/12/2000 [31] (1)	-1.74%	2.92%***	1.42%
(Reduction on income & cap. gains tax)			
01/01/2001 to 31/12/2006 [163] (2)	-1.35%	2.21%***	-0.16%
χ^2 **(2)**	*0.034*	*0.096*	*0.086*
Regulatory Changes			
01/01/1997 to 31/08/2002 [92] (1)	-2.43%*	3.07%***	-0.09%
(Stricter regulations on repurchases)			
01/09/2002 to 31/12/2006 [102] (2)	-0.50%	1.65%***	0.25%
χ^2 **(2)**	*0.172*	*0.192*	*0.019*

Table 3.6 **Continued.**		Panel B. Differences in Means per Country							
	-20, -2			-1, +1			+2, +20		
United Kingdom									
Tax Changes									
01/01/1997 to 31/03/1998 [56]	1			1			1		
01/04/1998 to 29/08/2001 [95]	-0.63%	1		-0.29%	1		0.22%	1	
	(0.780)			(0.754)			(0.907)		
30/08/2001 to 31/01/2005 [213]	1.23%	1.86%	1	-0.23%	0.06%	1	0.80%	0.58%	1
	(0.557)	(0.150)		(0.763)	(0.943)		(0.588)	(0.673)	
01/02/2005 to 31/12/2006 [149]	-0.57%	0.06%	-1.80%[***]	-2.38%[***]	-2.09%[***]	-2.15%[***]	0.16%	-0.06%	-0.64%
	(0.779)	(0.964)	(0.052)	(0.001)	(0.007)	(0.000)	(0.915)	(0.968)	(0.445)
Regulatory Changes									
01/01/1997 to 31/11/2003 [275]	1			1			1		
01/12/2003 to 31/12/2006 [238]	-0.75%			-1.92%[***]			-0.55%		
	(0.391)			(0.000)			(0.477)		
France									
Tax Changes									
01/01/1997 to 31/12/2004 [208]	1			1			1		
01/01/2005 to 31/12/2006 [55]	0.11%			0.70%			-0.81%		
	(0.925)			(0.196)			(0.483)		
Germany									
Tax Changes									
01/01/1997 to 31/12/2000 [31]	1			1			1		
01/01/2001 to 31/12/2006 [163]	0.39%			-0.71%			-1.58%		
	(0.820)			(0.475)			(2.489)		
Regulatory Changes									
01/01/1997 to 31/08/2002 [92]	1			1			1		
01/09/2002 to 31/12/2006 [102]	1.93%			-1.42%			0.34%		
	(0.242)			(0.195)			(0.901)		

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In France, changes in corporate and income tax rates did not have a significant impact on the market reaction to share repurchases. It can be seen however, that the announcement of open market share repurchases had an improving, but temporary effect, on the firms' market performance during the event window. However, the change in the market reaction during the event window between the pre- and post-tax change sub-periods is not statistically significant. Therefore, I do not find any evidence that tax changes have a significant impact on open market share repurchases in France.

Finally, the results from Germany are similar to those from France. The changes in tax and regulations did not have a significant effect on the market reaction to share repurchases. Despite the fact that the differences in mean market reaction through the different time sub-periods are not statistically significant, it appears that the imposition of stricter regulations on share repurchasing, thus making share repurchases more credible signals (sub-period (2) of the regulatory changes), the market reaction, contrary to my expectations, for the event window has decreased from 3.07% to 1.65%. I argue that this is perhaps a learning phenomenon, which means that the market had a more positive stance to share repurchases in the earlier years when they were first made legal. In addition, I argue that the market has realised that the announcement of intention to repurchase was not a positive signal for future growth and that perhaps the targeted shares were not actually repurchased. Concluding, the results show that only in the U.K., tax and regulatory changes that occurred during the ten year period of this study have a significant impact on the market reaction to share repurchases.

3.5.4. The drivers of the market reaction to the announcement of share repurchases

In order to test the hypotheses discussed in this research and identify the drivers of the market reaction to the announcement of a share repurchase, the following cross-sectional regressions are estimated for each country:

$$(U.K.) \quad CAAR_{it} = \beta_0 + \beta_1 LEV_{i(t-1)} + \beta_2 MKBK_{(t-1)} + \beta_3 CASH_{i(t-1)} + \beta_4 RET_{i(t-1)} + \beta_5 Log(SIZE)_{i(t-1)} + \beta_6 OWNCON_{i(t-1)} + \beta_7 DDIV_{i(t-1)} + \beta_8 D\_INITIAL_{i(t-1)} + \beta_9 DTAX\_1_{i(t-1)} + \beta_{10} DTAX\_2_{i(t-1)} + \beta_{11} DTAX\_3_{i(t-1)} + \beta_{12} DREG_{i(t-1)}$$

(France) $CAAR_{it} = \beta_0 + \beta_1 LEV_{i(t-1)} + \beta_2 MKBK_{(t-1)} + \beta_3 CASH_{i(t-1)} + \beta_4 RET_{i(t-1)} + \beta_5 Log(SIZE)_{i(t-1)} + \beta_6 OWNCON_{i(t-1)} + \beta_7 DDIV_{i(t-1)} + \beta_8 D\_INITIAL_{i(t-1)} + \beta_9 DTAX\_1_{i(t-1)} +$

(Germany) $CAAR_{it} = \beta_0 + \beta_1 LEV_{i(t-1)} + \beta_2 MKBK_{(t-1)} + \beta_3 CASH_{i(t-1)} + \beta_4 RET_{i(t-1)} + \beta_5 Log(SIZE)_{i(t-1)} + \beta_6 OWNCON_{i(t-1)} + \beta_7 DDIV_{i(t-1)} + \beta_8 D\_INITIAL_{i(t-1)} + \beta_9 DTAX\_1_{i(t-1)} + \beta_9 DREG_{i(t-1)}$

where *i* represents the firm, *t* represents time measured by the calendar year end, and CAR is the cumulative abnormal return for the three respective days surrounding the announcement day. I perform the multivariate analysis for each country individually, in order to identify if there are different factors that influence the market reaction, and if that is the case, which exactly are these country-specific factors that influence the market reaction to share repurchases. However, it must be noted that the drawback with this analysis is that it does not control for any information specific to each open market share repurchase announcement. The reason for this is that the overwhelming majority of announcements made by French and German firms are routinely targeting the maximum shares permitted by the respective regulatory authorities. In the United Kingdom however, it is less than half of the entire sample that provide specific information concerning their announcement of intention to repurchase shares on the open market (i.e. the nominal value intended to be utilised for the repurchase programme, and/or the number of shares intended to be repurchased, and/or the portion of shares targeted relative to the total number of common shares outstanding). Due to these limitations it is difficult to distinguish the true impact the announcement specific information has on the market reaction. Therefore, one should approach the findings of this analysis and their respective interpretation with caution, since it fails to control for information specific to the repurchase announcement which could add significantly on the explanatory power of the analysis.

The first hypothesis tested, is the optimal leverage hypothesis, according to which firms tend to repurchase their shares when their leverage ratio is below their target level ratio. As a proxy for a firm's leverage ratio, following Dittmar (2000) and Grullon and Michaely (2002), I use the ratio of total debt to total assets (LEV I) at the end of the calendar year prior to the repurchase announcement, in order to test the market reaction in relation to a firm's leverage ratio. Further, for robustness check of the optimal capital structure hypothesis, as in Dittmar (2000), I replicate the

multivariate analysis with LEV II, which is defined as the difference of net debt (total debt minus cash and equivalents) to total assets ratio from the median net debt to total assets ratio of each respective industry of the repurchasing firm, in the end of the calendar year prior to the repurchase announcement.

Further, according to the undervaluation hypothesis, firms repurchase their shares when their current share price does not reflect the true value of the firm, since management is better informed than the market. Therefore, firms that repurchase their shares have a high degree of information asymmetry. According to Vermaelen (1981) small firms are more likely to have higher information asymmetry, since they have less coverage by analysts and the media. Moreover, when there is a higher ownership concentration, there would be a higher level of information asymmetry. Therefore, I expect to find a positive relationship between the levels of ownership concentration and the market reaction. Thus, I include OWNCON which is the percentage of closely held shares divided by the number of common shares outstanding.

In addition, following Dittmar (2000) and Grullon and Michaely (2002), I use SIZE, which is the natural logarithm of the book value of a firm's total assets. Furthermore, I have replicated the multivariate analysis with the market capitalisation as a size proxy, and the results have remained unchanged. Nevertheless, information asymmetry is only one of the factors that can lead to undervaluation, since a firm's share price has to be less than its true value. As suggested in the current literature (e.g. Ikenberry et al., 1995; Jagannathan and Stephens, 2003; Dittmar, 2000), a reduction of the stock price is observed almost entirely prior to a share repurchase announcement, thus suggesting potential undervaluation. In order to capture a potential undervaluation, I use RET, which is the daily cumulative market adjusted return for the period of 255 prior to 2 days prior to the announcement of a share repurchase.

Moreover, Ikenberry et al. (1995) report that firms with low book-to-market ratios earn abnormal returns in the subsequent periods, which is in line with the undervaluation hypothesis. Thus, I include in the regression MKBK, which is the market value of equity divided by the book value of equity. Further, MKBK can be used in order to control for a firm's potential investment opportunity.

In order to test for the excess cash flow hypothesis, according to which firms repurchase their stock in order to distribute their excess capital and reduce potentially arising agency costs, I follow Dittmar (2000), and I include in the regression the

variable CASH, which is defined as the firm's ratio of net income before taxes plus depreciation and changes in deferred taxes and other deferred charges to total assets, at the end of the year prior to the share repurchase announcement. If the firm's motive to repurchase its shares is to distribute the excess capital instead of misplacing it to negative NPV projects, then it should be positively related to the market reaction, since it distributes its excess capital back to its shareholders.

Further, in order to control whether the market takes into account if a firm is repurchasing its shares as a substitute or complement to its overall payout policy, I include the dummy variable DDIV. DDIV takes the value of one if a firm has paid dividends in the year prior to the repurchasing announcement and zero if it has not paid dividends. Moreover, I test if the initial announcement has a greater market reaction than the subsequent announcements. For this purpose, I include D_INITIAL which takes the value of one if it is the initial announcement made by each firm and zero otherwise. Further, for testing the effect on the market reaction of each tax and/or regulatory change, I include DTAX_1 to DTAX_3 which are dummy variables that take the value of one when an announcement of intention to repurchase took place after a change occurred in tax regulations, that I hypothesise that could affect the market reaction on such announcements (for each country). DREG is a dummy variable which takes the value of one when an announcement of intention to repurchase took place after a change occurred in regulations that could significantly affect the market reaction on the announcement of intention to repurchase (for each country).

Table 3.7 reports the descriptive statistics for the proxy variables employed in the cross-sectional analysis. It is notable that in all three countries firms that announce their intention to repurchase their shares have lower leverage relative to the industry as denoted by the average negative net debt differential. Furthermore, firms in the UK have higher growth relative to France and Germany proxied by the market-to-book ratio. With respect to firms' cash holdings, in all three countries firms have similar cash levels and similar size levels. However, the table shows that firms in Germany experience a negative performance prior to the announcement of approximately 10.7% relative to the smaller in magnitude performance of 2.8% in France and 0.6% in the U.K. Finally, the ownership concentration for U.K firms is lower relative to German and French firms as expected.

Table 3.7 Summary Statistics

This table reports the number of observations, mean, standard deviation, minimum and maximum respectively for each of the three samples of the market reaction to the announcement of an open market share repurchase programme and the respective explanatory variables employed on the cross-sectional regressions for each of the three countries under analysis (UK, France and Germany) over the period 1997 to 2006. The table reports the number of observations, the mean, standard deviation, minimum and maximum for each of the reported variables. CAAR is the three-day cumulative abnormal return around the share repurchase announcement. LEV I is the ratio of total debt to total assets of the repurchasing firm in the end of the calendar year prior to the repurchase announcement. LEV II is the difference of the net debt to total assets ratio from the median net debt (total debt minus cash and equivalents) to total assets ratio of each respective industry of the repurchasing firm in the end of the calendar year prior to the repurchase announcement. MKBK is the market value of equity divided by the book value of equity at the year-end prior to the repurchase announcement. CASH is the firm's ratio of net income before taxes plus depreciation and changes in deferred taxes and other deferred charges to total assets at the end of the year prior to the share repurchase announcement. RET is the daily cumulative market adjusted return for the period of 255 days prior and 2 days prior to the announcement of a share repurchase. SIZE is the book value of a firm's total assets reported in millions of US dollars. OWNCON is the percent of closely held shares divided by the number of common shares outstanding. Closely held shares include shares held by management, corporations, benefit/pension schemes and individuals that hold 5% or more of the common shares outstanding. DDIV is a dummy variable that takes the value of one if a repurchasing firm paid dividends in the year prior to the repurchase announcement and zero otherwise. D_INITIAL is a dummy variable that takes the value of 1 if it is the initial announcement made by each firm and zero otherwise. DTAX_1 to DTAX_3 are dummy variables that take the value of one when an announcement of intention to repurchase took place after a change occurred in tax regulations that I believe that could affect the market reaction on such announcements (for each country). DREG is a dummy variable that takes the value of one when an announcement of intention to repurchase took place after a change occurred in regulations that could significantly affect the market reaction on the announcement of intention to repurchase (for each country).

		CAAR(-1+1)	LEV I	LEV II	MKBK	CASH	RET	SIZE	OWNCON	DDIV	D_INITIAL	DTAX_1	DTAX_2	DTAX_3	DREG
United Kingdom	Observations	513	482	512	468	476	513	482	468	475	513	513	513	513	513
	Mean	0.019	0.230	-0.051	2.804	0.114	-0.006	33,671	15.570	0.829	0.589	0.947	0.715	0.304	0.456
	Std. Dev.	0.056	0.185	0.310	4.627	0.129	0.329	131,418	17.568	0.376	0.493	0.224	0.452	0.460	0.499
	Min	-0.275	0.000	-1.309	0.000	-1.148	-1.676	3.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	0.386	0.928	0.685	44.960	0.640	1.022	1,333,350	71.809	1.000	1.000	1.000	1.000	1.000	1.000
France	Observations	263	258	263	226	240	263	256	226	255	263	263			
	Mean	0.008	0.236	-0.035	2.470	0.118	-0.028	43,234	42.544	0.812	0.700	0.209			
	Std. Dev.	0.049	0.161	0.295	2.309	0.105	0.385	165,727	24.703	0.392	0.459	0.407			
	Min	-0.180	0.000	-1.732	0.001	-0.516	-1.631	3.817	0.061	0.000	0.000	0.000			
	Max	0.193	0.800	0.606	16.240	0.485	1.350	1,482,838	88.182	1.000	1.000	1.000			
Germany	Observations	194	193	194	122	184	194	178	122	192	194	194	194		
	Mean	0.023	0.147	-0.067	3.094	0.120	-0.107	53,173	38.498	0.667	0.675	0.840	0.526		
	Std. Dev.	0.074	0.154	0.268	3.408	0.175	0.599	189,656	23.199	0.473	0.469	0.367	0.501		
	Min	-0.329	0.000	-0.866	0.200	-1.649	-2.330	11.702	0.004	0.000	0.000	0.000	0.000		
	Max	0.345	0.758	0.692	20.230	0.505	1.864	1,165,378	86.073	1.000	1.000	1.000	1.000		

The results from the cross-sectional regressions are shown in Table 3.8. It is only in the U.K. that he net debt difference from the median of each industry has a significant impact, whereas in France it is the first proxy for leverage used (total debt over total assets) that appears to be significant. Furthermore, I do not find leverage to be significant in the case of Germany.

Moreover, the market-to-book proxy is not significant for either of the three countries. However, in order to get robust evidence concerning the undervaluation hypothesis, I find evidence, as expected, that the past market adjusted return which is an alternative proxy for undervaluation, is inversely related to the market reaction in the U.K.. This means that the market perceives a share repurchase announcement as a positive signal, especially when it is preceded by poor past share price performance. This finding is consistent with Stephens and Weisbach (1998), who show that firms repurchase their stock after a period of negative share price performance. However, this is not the case for France and Germany where the past market-adjusted returns have a positive relationship with the market reaction on the day of the repurchase announcement. An explanation for this can be that even though firms that make share repurchase announcements show a positive share price performance, by making this announcement, the market believes that the firms' share price is still undervalued, which in turn the market reacts positively to that signal.

For Germany I find, contrary to my expectations, that a firm's excess cash flow is inversely related to the market reaction, but it is only for the German market that the excess cash proxy is significantly related to the market's reaction. The inverse relationship of cash with the market reaction implies that the market would prefer to see the excess cash being invested instead of being given back to the shareholders as a payout in the form of share repurchases.

Table 3.8 Cross sectional analysis per country on the drivers of the market reaction to share repurchase announcements.

This table reports the estimated coefficients of the following cross-sectional regression for each respective country:

$$CAAR_{it} = \beta_0 + \beta_1 LEV_{i(t-1)} + \beta_2 MKBK_{(t-1)} + \beta_3 CASH_{i(t-1)} + \beta_4 RET_{i(t-1)} + \beta_5 Log(SIZE)_{i(t-1)} + \beta_6 OWNCON_{i(t-1)} + \beta_7 DDIV_{i(t-1)} + \beta_8 D\_INITIAL_{i(t-1)} + \beta_9 DTAX\_1_{i(t-1)} +$$
$$\beta_{10} DTAX\_2_{i(t-1)} + \beta_{11} DTAX\_3_{i(t-1)} + \beta_{12} DREG_{i(t-1)}$$

The sample consists of firms in the U.K., France and Germany that announced a share repurchasing programme over the period 1997 to 2006. CAAR is the five-day cumulative abnormal return around the share repurchase announcement. LEV I is the ratio of total debt to total assets of the repurchasing firm in the end of the calendar year prior to the repurchase announcement. LEV II is the difference of the net debt to total assets ratio from the median net debt (total debt minus cash and equivalents) to total assets ratio of each respective industry of the repurchasing firm in the end of the calendar year prior to the repurchase announcement. MKBK is the market value of equity divided by the book value of equity at the year end prior to the repurchase announcement. CASH is the firm's ratio of net income before taxes plus depreciation and changes in deferred taxes and other deferred charges to total assets at the end of the year prior to the share repurchase announcement. RET is the daily cumulative market adjusted return for the period of 255 days prior and 2 days prior to the announcement of a share repurchase. SIZE is the natural logarithm of the book value of a firm's total assets. OWNCON is the percent of closely held shares divided by the number of common shares outstanding. Closely held shares include shares held by management, corporations, benefit/pension schemes and individuals that hold 5% or more of the common shares outstanding. DDIV is a dummy variable that takes the value of one if a repurchasing firm paid dividends in the year prior to the repurchase announcement and zero otherwise. D_INITIAL is a dummy variable that takes the value of 1 if it is the initial announcement made by each firm and zero otherwise. DTAX_1 to DTAX_3 are dummy variables that take the value of one when an announcement of intention to repurchase took place after a change occurred in tax regulations that I believe that could affect the market reaction on such announcements (for each country). DREG is a dummy variable that takes the value of one when an announcement of intention to repurchase took place after a change occurred in regulations that could significantly affect the market reaction on the announcement of intention to repurchase (for each country). The standard errors of the coefficients have been adjusted for heteroskedasticity using White's procedure. The p-values of the cross-sectional regressions are reported in parentheses. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively based on the p-values.

	United Kingdom				France				Germany			
Dependent Variable CAAR$_{(-1,+1)}$												
C	0.079***	0.073***	0.094***	0.088***	0.063**	0.084***	0.067**	0.081***	0.168**	0.159**	0.182***	0.172***
	(0.003)	*(0.004)*	*(0.000)*	*(0.001)*	*(0.019)*	*(0.002)*	*(0.020)*	*(0.003)*	*(0.011)*	*(0.014)*	*(0.007)*	*(0.008)*
LEV I	0.025	0.021			0.058***	0.048***\			-0.033	-0.025		
	(0.288)	*(0.297)*			*(0.002)*	*(0.011)*			*(0.413)*	*(0.534)*		
LEV II			0.023**	0.023***			0.000	0.000			-0.002	0.000
			(0.014)	*(0.008)*			*(0.875)*	*(0.929)*			*(0.941)*	*(0.989)*
MKBK	-0.001		-0.001		0.002		0.001		-0.002		-0.002	
	(0.141)		*(0.138)*		*(0.323)*		*(0.470)*		*(0.312)*		*(0.346)*	
CASH	0.007	-0.020	0.006	-0.022	-0.028	-0.048	-0.047	-0.060*	-0.220***	-0.197**	-0.218***	-0.196**
	(0.794)	*(0.362)*	*(0.826)*	*(0.333)*	*(0.405)*	*(0.154)*	*(0.185)*	*(0.060)*	*(0.009)*	*(0.012)*	*(0.009)*	*(0.012)*
RET	-0.033***	-0.026**	-0.036***	-0.029*	0.554***	0.577***	0.561***	0.577***	0.326*	0.369*	0.335*	0.376*
	(0.006)	*(0.021)*	*(0.003)*	*(0.010)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.085)*	*(0.053)*	*(0.079)*	*(0.051)*
SIZE	-0.003**	-0.003**	-0.003**	-0.003***	-0.004**	-0.004***	-0.003*	-0.003**	-0.008**	-0.008**	-0.009***	-0.009***
	(0.034)	*(0.033)*	*(0.011)*	*(0.009)*	*(0.015)*	*(0.005)*	*(0.069)*	*(0.024)*	*(0.012)*	*(0.014)*	*(0.005)*	*(0.006)*
OWNCON	0.000	0.000	0.000*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.100)	*(0.128)*	*(0.095)*	*(0.129)*	*(0.315)*	*(0.341)*	*(0.473)*	*(0.482)*	*(0.514)*	*(0.391)*	*(0.645)*	*(0.489)*
DDIV	-0.004	-0.001	-0.008	-0.004	-0.010	-0.012	-0.011	-0.013	0.029*	0.023	0.031*	0.025
	(0.719)	*(0.922)*	*(0.487)*	*(0.662)*	*(0.278)*	*(0.172)*	*(0.227)*	*(0.157)*	*(0.081)*	*(0.124)*	*(0.074)*	*(0.118)*
D_INITIAL	0.002	0.004	0.002	0.004	-0.006	-0.008	-0.006	-0.007	-0.006	-0.009	-0.009	-0.010
	(0.699)	*(0.571)*	*(0.691)*	*(0.551)*	*(0.283)*	*(0.221)*	*(0.324)*	*(0.270)*	*(0.678)*	*(0.549)*	*(0.535)*	*(0.439)*
DTAX 1	-0.023	-0.019	-0.024*	-0.020	0.001	0.001	0.001	0.001	-0.026	-0.027	-0.029	-0.029
	(0.072)	*(0.134)*	*(0.059)*	*(0.109)*	*(0.849)*	*(0.902)*	*(0.844)*	*(0.884)*	*(0.250)*	*(0.193)*	*(0.201)*	*(0.166)*
DTAX 2	0.014	0.011	0.014	0.011								
	(0.136)	*(0.228)*	*(0.136)*	*(0.222)*								
DTAX 3	-0.002	-0.005	-0.007	-0.009								
	(0.768)	*(0.423)*	*(0.391)*	*(0.180)*								
DREG	-0.020**	-0.018**	-0.015*	-0.014*					0.004	0.004	0.004	0.004
	(0.015)	*(0.018)*	*(0.073)*	*(0.070)*					*(0.830)*	*(0.796)*	*(0.831)*	*(0.818)*
Adjusted R^2 (%)	**9.73**	**8.31**	**10.43**	**9.16**	**28.79**	**31.49**	**25.68**	**29.36**	**17.88**	**18.30**	**17.53**	**18.11**

Further, as expected, a firm's size is inversely related to the market reaction to open market share repurchase announcements for all three countries, which is aligned to the findings of Ikenberry at al. (1995) and Grullon and Michaely (2002). Regarding the ownership concentration, the results provide week evidence, suggesting that the market reaction cannot be explained by the respective ownership concentration levels.

As shown earlier, the market reaction to the initial announcement during the event window is significantly higher. Therefore, I expect to find in the cross-section analysis, that the dummy variable that captures the initial announcement D_INITIAL is positive and significant. Nevertheless, when controlling for other variables as well, D_INITIAL is proven to not be statistically significant. After conducting further tests (not reported), in order to determine why this variable is not significant, I find that it is the variable SIZE and the respective tax and regulatory change dummies in each country that cancel out the significance of the dummy variable D_INITIAL. This can be explained by the fact that it is expected to be large firms, in terms of size, that are likely to announce their intention to repurchase their shares in the open market. In addition, it should be large firms as well, that are more likely to make subsequent announcements. Hence, size cancels out the significance of the dummy variable D_INITIAL.

Moreover, I find some evidence that firms which pay dividends have a higher market reaction to the announcement of a share repurchase, but only in Germany. This suggests that the German market welcomes this extra payout what will come in the form of share repurchases. Finally, as expected from the univariate analysis, I find that it is only for the U.K. market that both the change in taxation, where ACT was still effective, and the change in regulations where firms were allowed to keep the repurchased shares as Treasury Stock, have a significant and negative effect on the market reaction. The evidence on the tax impact is consistent with Rau and Vermaelen (2002) and Lie and Lie (1999) which suggest that repurchase activity is influenced by the tax impact of share repurchases. Furthermore, the results show that by lifting any tax and/or regulatory constrains from share repurchases, the market shows a more favourable reaction.

Following, I assess whether the market reacts significantly different to firms that have specific varying firm characteristics. The firm characteristics under investigation are the ownership concentration, leverage, market-to-book ratio and the cumulative one year stock returns prior to the announcement. For assessing the impact of these

characteristics on the market reaction to share repurchase announcements, I perform the following analysis. First, I split the samples into two groups in each country. Those firms that have a level of ownership concentration lower than the median of the entire group of firms, that have announced their intention to repurchase their shares in each country, and those that have higher than the respective median level. I repeat the same process for the variables market-to-book, leverage, and one year cumulative past returns. Then I perform a univariate analysis between these two sub-groups for the pre-, event, and post-announcement time windows, for each variable in question, individually. The results are reported in Table 3.9.

Regarding the impact of ownership concentration on the market reaction to share repurchases, the findings show that for all three countries, there is no significant difference in the market behaviour prior and post the announcement between the two sub-groups. Nevertheless, I find that only in the U.K. and Germany, firms that have higher ownership concentration (higher than the median) have a significantly higher market reaction on the event window. This confirms the previous finding on the effect of ownership concentration, where less diversely owned firms have higher levels of information asymmetry which lead to a higher market reaction, but only at the time of the announcement.

The evidence for leverage shows that it is only in Germany that firms that have lower (than the median) leverage, experience a post-announcement negative performance. I argue, that this is due to the high market reaction to the repurchase announcement made by firms with low leverage, which after the announcement, the market corrects itself, and hence reflecting a negative share price performance during the post-event window.

Furthermore, the findings show that in the U.K., firms that are more likely to be undervalued, since their respective market-to-book ratios are below the median, experience a significantly higher market reaction during the event window. In addition, the market makes a small adjustment on the post-event period for firms with low market-to-book ratios. In contrast, for firms with higher market-to-book ratios, the market under-reacts during the event window, since their stock performance is positive and significantly different, compared to firms with lower market-to-book ratios during the post-event window. Similarly, I find in the U.K., that for firms with lower past share price performance the market reaction is significantly higher, which remains positive on the post-event period, as opposed to firms with higher past share

price performance, for which the market shows a correction of its initial reaction during the event window. Furthermore, I find that in France, firms with higher past share price performance have a negative share price performance during both the pre- and post-event windows.

The evidence on the impact that size has on the market reaction, show consistently in all three countries, that firms which are smaller in size, have a considerably higher market reaction to the repurchase announcement during the event window. Additionally, it is notable that the market reaction during the event window of the share repurchase announcements made by smaller firms, is significantly high and statistically significant. The results on size, confirm the earlier findings on the cross-section analysis that size is inversely related to the market reaction to repurchase announcements, which is also in line with the findings of Ikenberry at al. (1995) and Grullon and Michaely (2002). I argue that the reason for this is that smaller firms experience higher information asymmetries. Therefore, by announcing their intention to repurchase their shares, as argued by Bhattacharya and Dittmar (2003), they attract the market's scrutiny, which consequently leads to a high market reaction. In sum, the results from this analysis support the findings derived from the cross-section analysis.

Concluding, I find evidence in support of the undervaluation hypothesis, that the ownership concentration has a statistically significant but marginal impact on the market reaction to share repurchase announcements, and that firm size is inversely related to the market reaction. Finally, for the U.K., I find strong evidence that changes in taxation and regulations do have a significant and negative impact on the market reaction to open market share repurchase announcements.

Table 3.9 Individual firm specific characteristics' impact on the market reaction to share repurchase announcements.

The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the U.K., 263 in France and the remaining 194 in Germany, for the period 1997 to 2006. The abnormal returns are calculated with the implementation of the ordinary least squares market model with the coefficients computed over the -255 to -21 days before the announcement date. The table reports the cumulative average abnormal returns for selected time-windows, for the entire sample and for the two sub-samples of firms that have a respective ownership concentration, market-to-book ratio, leverage ratio, cumulative past one year returns prior to the repurchase announcement, and size, below and above the median respective values for each country. The p-values of the differences in means between the two sub-samples (below and above the median) are reported in parentheses. [***], [**], and [*] reported on the average abnormal returns indicate statistical significance at the 1, 5 and 10% level respectively.

	Entire Sample	Magnitude of Ownership Concentration		Magnitude of Market-to-Book		Magnitude of Leverage		Magnitude of Cumulative Past Returns		Magnitude of Size	
		Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median
						United Kingdom					
-20, -2	0.13%	0.24%	-0.01%	0.76%	-0.54%	0.02%	0.22%	0.56%	-0.30%	0.42%	-0.14%
		(0.778)		(0.128)		(0.821)		(0.314)		(0.521)	
-1, +1	1.68%[***]	1.32%[***]	2.52%[***]	2.27%[***]	1.43%[***]	2.00%[***]	1.74%[***]	2.42%[***]	1.30%[***]	2.79%[***]	1.05%[***]
		(0.018)		(0.091)		(0.595)		(0.024)		(0.001)	
+2, +20	0.91%[*]	1.04%[*]	0.76%	-0.46%	2.35%[***]	1.09%[*]	0.75%	2.87%[***]	-1.05%[**]	0.90%	0.92%[**]
		(0.709)		(0.000)		(0.656)		(0.000)		(0.977)	
N	513	282	231	263	250	241	272	257	256	241	272

Table 3.9 Continued

	Entire Sample	Magnitude of Ownership Concentration		Magnitude of Market-to-Book		Magnitude of Leverage		Magnitude of Cumulative Past Returns		Magnitude of Size	
		Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median
					France						
-20, -2	-0.51%	-0.90%	-0.03%	-0.44%	-0.58%	-0.44%	0.44%	0.81%	-1.84%[*]	-1.50%	0.44%
		-0.567		-0.924		-0.486		-0.08		-0.201	
-1, +1	0.66%[**]	0.80%[**]	0.79%[*]	0.90%[*]	0.69%	0.53%	1.05%[*]	1.16%[*]	0.43%	1.57%[***]	0.05%
		-0.979		-0.733		-0.386		-0.227		-0.012	
+2, +20	-0.80%	-0.58%	-0.80%	-0.44%	-0.92%	-1.43%	0.05%	0.93%	-2.30%[***]	-0.94%	-0.42%
		-0.854		-0.688		-0.216		-0.006		-0.665	
N	263	146	117	132	131	132	134	132	131	129	134
					Germany						
-20, -2	-1.42%	-1.30%	-1.61%	-1.34%	-1.49%	-0.95%	-1.88%[*]	-1.41%	-1.42%[*]	-1.78%	-0.96%
		-0.861		-0.926		-0.569		-0.991		-0.573	
-1, +1	2.32%[***]	1.84%[***]	3.13%[***]	2.20%[***]	2.44%[***]	3.18%[***]	1.46%[**]	2.84%[***]	1.80%[***]	4.08%[***]	0.56%[*]
		-0.023		-0.821		-0.108		-0.331		-0.001	
+2, +20	0.09%	1.70%	-2.64%	0.34%	-0.16%	-2.36%	2.55%[**]	1.08%	-0.89%	-0.96%	1.14%
		-0.18		-0.848		-0.061		-0.454		-0.424	
N	194	122	72	97	97	97	97	97	97	97	97

3.6. Summary and Conclusions

The purpose of this chapter is to provide a comprehensive cross-country analysis of the market reaction to the announcement of open market share repurchases in the U.K., France and Germany. I expect to find that the market's perception and reaction to share repurchase announcements differs in each country, due to their differences in institutional, tax and regulatory frameworks. Moreover, I expect to find support in the U.K. market, of the undervaluation hypothesis documented in the U.S. studies, due to the structural and market similarities between the U.K. and the U.S. In addition, I test if any changes in the regulatory frameworks or in the respective tax regimes can have a significant effect on the market reaction to share repurchases. I expect to find that both regulatory and tax changes can have a significant effect on share repurchases, since these changes can affect the flexibility and advantages that share repurchases can offer. Further, this chapter tests if there is any significant difference on the market reaction to firms that announced only once their intention to repurchase their shares and firms that made multiple announcements of their intention to repurchase their shares, throughout the ten year period under study. I expect to find that the market will become accustomed to such announcements, and it will have a more positive reaction to the initial announcement of intention to repurchase. Finally, I strive to establish the significant drivers of the market reaction to share repurchase announcements by performing a cross-sectional analysis.

In this chapter a comprehensive sample of 970 open market share repurchase announcements is used. The overwhelming majority of these announcements took place in the U.K. This is aligned with the notion that share repurchases are a more popular way of returning cash back to the shareholders, as well as the fact that the stringent regulations and tax regimes were preventing firms from undertaking share repurchases in France and Germany.

The initial results do not provide a strong support for the undervaluation hypothesis, since even though the share price performance is quite poor during the pre-announcement period, it is not statistically significant in all three countries. Nevertheless, the market reaction during the time of the repurchase announcement significantly increases, suggesting that the markets perceive the announcement of a share repurchase programme as being positive news. Over the post-event period, the

U.K. market seems to continue having a positive reaction, whereas the German market seems to rebalance its initial reaction to the announcement, and finally the French market seems to have an even more negative reaction compared to the one it had prior to the announcement. Nevertheless, the performance of the German firms remains on the positive side, due to a strong positive reaction in the event period.

Further, when splitting the sample between the initial and subsequent announcements, it appears that for all three countries the respective markets have a much more favourable reaction to the initial announcements during the event period. Therefore, the markets have a considerably more favourable reaction towards the initial announcement of intention to repurchase. But it is only for the U.K. that the initial announcements have a better market reaction during the post-event period. Even though these results provide a good indication on the difference of the market reaction between initial and subsequent announcements and their respective information content, one should approach these findings with caution. This is due to the fact that the results of the univariate analysis omit other important factors such as time and size that can impact the market reaction to repurchase announcements.

Additionally, this chapter tests if there are any changes in regulations and taxation (capital gains, income tax and corporate tax), that have a significant impact on the market reaction to share repurchase announcements. The results show that both regulatory and tax changes do have a significant impact on the market reaction in the U.K. market. Moreover, the results show that the market reaction to open market share repurchase announcements varies among countries, which suggests that institutional, regulatory, firm specific and tax factors explain the market valuation of share repurchases in these three European countries. Contrary to the U.K. evidence, the market reaction in France and Germany is not significantly affected by regulatory and tax changes. Finally, when performing a cross-sectional analysis I find evidence of undervaluation, and that size has a significant and inverse relationship to the market reaction. Finally, I find that for the three different countries it is the interaction of different firm specific characteristics that have a significant impact on the market reaction in each country.

Chapter 4.
4. Share Repurchase Announcements and Actual Trades: Completion Rates, Managerial Timing and Risk

In this chapter, I investigate the actual share repurchase trades of 196 publicly announced open market share repurchase programmes, and their respective completion rates, that took place in the U.K. during the ten year period from 1996 to 2006. I find that repurchasing firms have, on average, a completion rate of 74%. In addition, the evidence show that managers trade strategically, in order to provide price support. Moreover, I find that repurchasing firms experience a significant decline in systematic risk during the days when the actual repurchase trades took place, which increases significantly following the conclusion of the open market share repurchase programme. Finally, for robustness check, I perform a risk decomposition of the sample firms' total risk, to its systematic and idiosyncratic risk, which confirms the findings on risk changes.

4.1. Introduction

Share repurchases and especially open market share repurchases have become a common payout method over the recent years. Moreover, it is well documented that open market share repurchases are more popular than fixed-price tender offers or Dutch auctions (see Ikenberry et al. 1995; Stephens and Weisbach 1998; Grullon and Michaely 2004; Ginglinger and Hamon 2007; and Ikenberry et al., 2000). However, under the open market share repurchase method, companies are not required to repurchase their shares. Therefore, this practice raises a number of questions, namely, what is the completion rate of the intended repurchase programme? What are the firm specific characteristics that influence the completion rates of share repurchase programmes? Do managers repurchase shares strategically? Do the repurchase announcement and the reporting of the repurchase trades have an impact on firms' risk?

For addressing these questions, I use a sample of 196 announcements of intention to repurchase shares in the open market in the U.K., over the period 1997 to 2006. I find that approximately 30% of the sample firms did not repurchase their shares at all. In addition, I find that firms repurchase on average 74% of the shares targeted on the announcement. Furthermore, I investigate whether managers trade strategically, and the evidence suggests that managers are willing to pay a higher price compared to the average weighted price of previous days, which supports the price support hypothesis. Moreover, I analyse if any risk change occurs due to open market share repurchase announcements, and I find some evidence that it is firms that pay out less dividends, that experience a decline of systematic risk after the repurchase announcement.

Apart from the announcement effect on firm risk, I analyse if any risk change occurs during the actual implementation of the repurchase programme, and I find that firms experience a significant decline in systematic risk during the days when the actual repurchase trades took place. In addition, I find that repurchasing firms have significantly higher systematic risk compared to their peers of similar valuation throughout the entire process of share repurchases. Finally, for robustness check I perform a risk decomposition of the sample firms' total risk to its systematic and

idiosyncratic risk. The results confirm the findings that firm risk significantly declines during the days of the actual repurchase trades.

The existing literature has been focusing mostly on what is the information content of share repurchase announcements and the respective underlying theories. As discussed earlier, the most prevailing theories are undervaluation, agency theory, capital restructuring, dividend substitution, and management compensation incentive hypotheses. However, the majority of the literature concerning share repurchases focuses on the U.S. market (see Allen and Michaely, 2003). In this chapter I analyse the actual share repurchase trades and the completion rates of the announced open market share repurchase programmes. Further, I identify if managers trade strategically or if they repurchase for price support. Finally, I perform a thorough examination on the effect that open market share repurchase announcements, and the implementation of the actual repurchase trades, can have on firm risk.

In the U.S., it is difficult to follow the completion rates of the announced share repurchase programmes, because the only disclosure requirement is the quarterly number of shares outstanding in the financial statement. Stephens and Weisbach (1998) find in the U.S., that it takes on average three years for firms to complete their repurchase programme. In addition, they find that firms repurchase approximately 80 percent of the shares targeted in the announcement. In Canada, Ikenberry et al. (2000) find that the mean completion rate is only 28.6%. In addition, the authors report evidence suggesting that managers trade strategically. Nevertheless, these studies employ quarterly and monthly data, hence making it difficult to analyse the completion rates of the announced repurchase programmes, and the respective timing of execution.

In order to overcome this limitation, Oswald and Young (2004) in the U.K., Ginglinger and Hamon (2007) in France and Zhang (2005) in Hong Kong, employ daily data on share repurchases and the respective actual repurchase trades. Oswald and Young (2004), even though they test the impact of undervaluation on the decision to repurchase, they do not focus on the actual timing of the repurchase trades in order to achieve a clear understanding of managers' timing ability. Nevertheless, the authors find that as share prices fall, managers tend to repurchase more shares. The evidence from Hong Kong shows, that firms repurchase their shares following price drops, and show a positive short-term performance after the repurchases. Hence, it suggests that managers time their repurchase trades and trade against market trends,

which supports the market timing hypothesis. In contrast, the evidence from France, shows that firms repurchase their shares following periods when share prices have been falling, but show no improvement of share price performance after the repurchase trades, which supports the price support hypothesis.

Berk et al., (1999) argue that good news is associated with a reduction in systematic risk, whereas bad news is associated with an increase in systematic risk. Since share repurchases can be an effective method for reducing potential agency costs, the announcement, and the actual implementation of share repurchases can convey information to the market, that the firm is experiencing a reduction in future investment opportunities. Moreover, a number of research studies (Dann et al., 1991; and Hertzel and Jain, 1991, on fixed price tender offers) and (Bartov, 1991; and Grullon and Michaely, 2004, on open market share repurchases) find evidence that firms in the U.S. experience a significant decline in systematic risk after the announcement of the respective share repurchase programme. In contrast, Peyer and Vermaelen (2009) argue that the abnormal returns obtained with Ibbotson's RATS methodology cannot be explained as the market's underreaction to risk changes. In addition, Denis and Kadlec (1994) find no evidence of systematic risk changes after adjusting for potential estimation bias.

Given the recent growth in share repurchase activity, and the relatively unexplored area of the actual repurchase trades, as well as the completion rates of the announced repurchase programmes, fresh evidence from the U.K. market can provide a vigorous insight in the ambiguous area of share repurchasing. The reason for this is that in the U.K., firms are only required to get their shareholders' approval for initiating a share repurchase programme. They are not required to announce publicly their intention to repurchase their shares, yet a number of firms do. Moreover, firms in the U.K. are required to disclose the repurchased shares on the day when the actual repurchase trades took place, until the start of the following trading day. Therefore, by employing U.K. data in this research, I can identify what is the information content of open market share repurchases.

The evidence on the U.K. market are comparable to the U.S. and international findings, hence the contribution of this chapter is significant. To this end, I add to the knowledge on the completion rates of open market share repurchases, and I investigate if managers repurchase strategically (i.e. market timing or price support hypotheses). Additionally, I investigate if open market share repurchases have

information content that can affect firm risk, an area that has not been vigorously investigated, apart from Grullon and Michaely (2004) and Bartov (1991) where both studies focus only on the announcement and the respective risk changes, and only on the U.S. market. Moreover, I analyse the actual daily repurchase trades and investigate if the market follows up on them, which will be reflected on the respective risk changes. Finally, I provide a broad and clear picture on overall firm risk, by performing a risk decomposition surrounding the entire process of open market share repurchases, from the announcement of the repurchase programme and its initiation, to the short term period after its completion.

The remaining of this chapter is organised as follows. Section 4.2 discusses the current literature and sets the hypotheses that are to be tested. Section 4.3 presents the data and an overview of the descriptive statistics. In addition the methodology applied in this chapter is discussed. Section 4.4 contains the discussion of the empirical results and their implications. The conclusions are in Section 4.5.

4.2. Literature Review & Hypotheses Setting

In this section I discuss the theories that have been developed over the actual repurchases and the completion rates of the announced repurchase programmes, as well as the change of firm risk surrounding share repurchases. Furthermore, I develop and set my hypotheses for each of the contending theories that are tested. This enables me to identify if firms in the U.K. actually repurchase the intended amount they have announced, if managers trade strategically, and finally, if there are any significant risk changes surrounding share repurchase announcements and the respective actual share repurchase trades.

4.2.1. Actual Repurchases and Timing

Open market share repurchases are, nowadays, one of the most common ways for companies to distribute their excess cash back to their shareholders. One of the most prominent motives for a firm undertaking a share repurchase, which has been well documented in the current literature, is the signalling hypothesis. The signalling hypothesis implies that a share repurchase signals the management's belief that the firm's current stock price is undervalued. A number of research studies for the U.S. market (e.g. Vermaelen, 1981; Ikenberry et al., 1995; Stephens and Weisbach, 1998), Canada (Ikenberry et al., 2000) and Europe (Lasfer, 2005; Ginglinger and L'Her,

2006), report negative abnormal returns prior to share repurchase announcements which are followed by a period of positive abnormal returns, which support the signalling hypothesis.

One of the most advantageous attributes of open market share repurchases is their ample flexibility on the timing and execution of the repurchase programme. However, the announcement of a share repurchase programme poses no commitment to the firm, and quite often is not fully implemented, or firms may choose not to repurchase any shares at all. Stephens and Weisbach (1998) report evidence from the U.S. market, that firms repurchase either a substantial fraction of the announced shares or almost none at all. Specifically, they find that firms repurchase approximately 80% of the shares targeted at the time of the announcement. In addition they find that it takes approximately three years for firms to complete the announced repurchase programme. Finally, they find that 30% of their sample of firms, continue to repurchase their shares after completing the initially announced repurchase programme. In Europe, the open market share repurchase completion rates are even lower. Rau and Vermaelen (2002) find that firms repurchase only 37% in the U.K., and Ginglinger and Hamon (2003) report that firms in France repurchase only 10% of the intended amount.

This lack of commitment for completing the announced open market share repurchase programmes makes the signalling hypothesis quite controversial, since an open market share repurchase is not a costly signal (meaning that it could be imitated even by a bad firm), thus lacking credibility. On the other hand though, Bhattacharya and Dittmar (2003) argue that an open market repurchase announcement can nevertheless be a credible positive signal, because by making such an announcement, the company will attract the market's attention upon itself. Consequently, the bad firm cannot mimic the good firm, because the bad firm would want to avoid any possible scrutiny by the market. Further, Bhattacharya and Dittmar (2003) argue that the more a firm is undervalued, or ignored by the market, the greater the scrutiny will be, which in turn could lead to a greater benefit and profit by discovering this information about the firm.

It can be argued that a firm's management could have more firm-specific information about their firm, which could lead to a better judgment concerning the true value of their firm as being a good investment or not. Comment and Jarrell (1991) find evidence that firms tend to announce a share repurchase programme when

their stock price is most likely to be undervalued. Their findings suggest that managers do possess superior information compared to the market.

But what is not clear however, is whether managers are able to identify and exploit opportunities in making actual share repurchases, suggesting that managers have timing ability in conducting the actual share repurchase trades and not just in the announcement of the share repurchase programme. In contrast, one could argue that outside institutional and professional investors could have as much information as firm insiders since they could even have similar or even greater ability to process this information.

In the U.S. it is difficult to follow if firms actually repurchase the amount of shares they have targeted on the announced share repurchase programmes. This is due to the fact that U.S. corporations can announce share repurchase programmes without implementing them, and can repurchase their shares without making any announcements. The only disclosure requirement they have is the number of shares outstanding at each quarterly financial statement. In order to overcome this obstacle, Stephens and Weisbach (1998) use the quarterly change in a firm's common shares outstanding as a proxy of the actual repurchased shares. In a different approach, Cook et al. (2004) use voluntarily disclosed repurchase trading data, and find that firms repurchase their shares following price drops and that prices stabilise following repurchase trades. But the drawback with these findings, is that the provided data are voluntarily disclosed, therefore lacking credibility.

Nevertheless, there has been a recent regulatory change concerning the disclosure requirements of open market share repurchases that was introduced in 17th of December, 2003. According to this Exchange Act[12], U.S. listed firms are required to report on a monthly basis, the exact volume and price data of their repurchase activity in their prerequisite quarterly filings. De Cesari et al. (2009) report that firms repurchase their shares at relatively lower prices, within each month of repurchase activity and buy more shares when market prices are relatively low. Hence the authors find evidence suggesting that firms in the U.S. market have timing ability on repurchasing their shares. In contrast, Dittmar and Dittmar (2008) in the U.S., find no evidence of undervaluation as having an impact on the actual share repurchase trades.

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[12] The change in disclosure requirements for repurchase activity was introduced as Purchases of Certain Equity Securities by the Issuer and Others, Exchange Act Release No. 33-8335, available at http://www.sec.gov/rules/final/33-8335.htm.

Rather, they find that share repurchases are responses to cyclical business waves, and not potential undervaluation, since they find no evidence of the market-to-book ratio and share price performance to have an impact on share repurchase activity.

However, since the U.S. repurchase activity information is not publicly available in a timely manner, this could not allow answering the question if the market truly follows upon the completion progress of an announced open market share repurchase programme. For the Canadian market, Ikenberry et al. (2000) use monthly repurchase data, since firms are required to report each month the number of actual shares they have repurchased. In this study, they find evidence that price changes have a significant impact on repurchase activity, suggesting that managers demonstrate timing ability since they manage to trade strategically.

Nevertheless, due to the fact that these studies rely on quarterly or monthly data (Stephens and Weisbach, 1998; Ikenberry et al., 2000; Dittmar and Dittmar, 2008), or they use voluntary questionnaires (Cook et al., 2004) it is difficult to get a precise understanding of the proportion of the actually repurchased shares. In addition it would be difficult to get a precise understanding of the completion rates of the announced repurchase programmes as well as for the timing of the repurchase execution.

In order to overcome this limitation, Zhang (2005) investigates the share price performance surrounding actual share repurchases in the Hong Kong market, where firms are required to disclose the actual share repurchases by the following business day, therefore providing accurate measurements. In this study, the author reports evidence of negative share price performance for the twenty day period prior to repurchases, which becomes positive for the twenty days after the repurchase trades. Hence, it suggests that managers go against the market trends and repurchase shares, which also supports the market timing hypothesis.

Ginglinger and Hamon (2006) study the French market, where listed firms are required to disclose data on repurchases for a given month at the beginning of the following month. Nevertheless, the authors obtain precise trading days and find that firms repurchase their shares during periods subsequent to falling shares prices, suggesting that managers trade opportunistically. The market timing hypothesis implies that a firm's share price should be lower on repurchase days, compared to subsequent non-repurchase days. Nevertheless, they find no significant price increases after the actual repurchases have taken place, thus not finding any evidence

for the market timing hypothesis. Rather, the authors find evidence supporting the price-support hypothesis, according to which a firm's share price should be lower on repurchase days than on prior non-repurchase days.

Oswald and Young (2004) investigate the U.K. market, and find that as prices fall, managers tend to repurchase more shares. Nevertheless, they focus mostly on the undervaluation hypothesis and the effect it has on the actual trades, without testing for the actual timing of execution of each trade. Therefore, it is not clear, whether managers time their repurchases, or if they repurchase in order to provide price support. In another research study focusing on the U.K. market, Keswani et al. (2007) investigate whether open market share repurchases provide price support during firms' close periods[13]. Their findings provide mixed evidence on price support since for final close period announcements the results are not statistically significant. However, the results from the interim close period announcement provide strong evidence which support the price support hypothesis. In addition, the authors find that open market share repurchases have a stronger price support effect for firms announcing large repurchase programmes during the period instantly adjacent to the close period.

In order to shed light on the controversy of the market timing hypothesis, I employ data from the London Stock Exchange. U.K. data are of particular interest because firms, similarly to the Hong Kong stock exchange, must report the number of actual shares repurchased no later than the beginning of the following business day. In contrast, U.S. reporting requirements make it difficult to accurately measure the completion rate of an announced share repurchase programme (Stephens and Weisbach, 1998). Further, even though in Canada firms have to report the actual repurchased shares on a monthly basis, it poses a great difficulty for testing if managers have a timing ability, since daily data on actual repurchases are not available.

Consequently, the data I employ allows me to accurately measure the completion rates of the announced share repurchase programmes, as well as determining if managers' motivation is market timing or price support. Hence, the results can be compared to the previous studies in the U.S. and Canadian markets, and

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[13] According to the regulations of the London Stock Exchange, firms are prevented from repurchasing their shares during period prior to the announcement of a firm's financial results (for details, please see the Financial Services Authority Model Code LR 9.2, Annex 1).

even more so, to the findings in Paris and Hong Kong stock exchanges. In order to do this, I calculate the number of repurchased shares, and I estimate the respective completion rates, depending on the targeted dollar value or the targeted proportion of the current common shares outstanding at the time of the announcement. Moreover, following Ginglinger and Hamon (2006), I examine the relative prices for repurchase and non-repurchase days.

4.2.2. Risk Changes

An additional motive for announcing and implementing a share repurchase programme, that has been extensively discussed in the literature, is the agency cost of the free-cash-flow hypothesis (Easterbrook, 1984; Jensen, 1986). Furthermore, Grullon and Michaely (2004) do not find any evidence in the U.S. market that firms announcing a share repurchase experience an increase in future profitability compared to their peers. In addition, the authors find that the capital expenditure levels, as well as the cash reserves for the respective share repurchasing firms, decline over time. Finally, Grullon and Michaely (2004) find that the market reaction is strongest to share repurchase announcements made by firms that are most likely to over-invest.

Hence, the authors argue that this evidence points to the fact that firms increase their payouts as a reaction to their decline in investment opportunities. Since firms are more likely to have lower future growth opportunities, their value is more likely to be determined by their assets in place, which in turn will lead to a reduction of systematic risk (Berk et al., 1999). The authors argue that given the expectations of security payoffs, the systematic risk across securities should be correlated to their respective market value. Further, they argue that firms that tend to perform well are those that have discovered positive investment opportunities and as they venture into those investment opportunities, their systematic risk changes.

In addition, good news is on average associated with a decline in systematic risk, whereas bad news is associated with an increase in systematic risk (Berk et al., 1999). Further, the authors assume that firms own only two kinds of assets. First, their assets in place and their currently generated cash flows, and second, options to make positive investments in the future. With the passing of every time period, the firm matures and the generated cash flows could die off and new investment opportunities could be found by the company. A potential investment that bears low systematic risk will look attractive to the firm, and by investing in it, it will subsequently lead to the

firm's increase in value. Nevertheless, by investing in lower risk investment opportunities, the firm's average systematic risk will decline, which in turn will lead to lower returns. In contrast, if a firm loses a low systematic-risk asset, then, in turn, its current value will decline and its average systematic risk will increase.

Therefore, a firm's reinvestment rate will lead to free cash flows which, in turn, can increase the likelihood of managers overinvesting. In order to reduce potential agency costs, shareholders will pressure management to give out cash. Hence, share repurchases could convey information to the market that the firm is experiencing a reduction in investment opportunities. Thus, share repurchases can be associated with a reduction in systematic risk (Grullon and Michaely, 2004).

Grullon et al., (2002) argue that the market could be more aware of the reduction in profitability than the firm's respective decline in systematic risk. Therefore, a share repurchase announcement increases the market's awareness of both the decline in future profitability and systematic risk. This is also supported by the evidence reported in Lintner (1956) and Brav et al., (2005) according to which managers are more inclined to increase pay outs when they feel that their firm's future cash flows are less risky. Further, Dann et al., (1991) studying any potential risk changes surrounding tender offer share repurchase announcements in the U.S. market, report evidence that repurchasing firms' risk declines both prior and post the tender offer repurchase announcement, and that firm leverage is not affected by the repurchase. Hertzel and Jain (1991) in a similar study concerning tender offer share repurchases in the U.S. market, report evidence that firm risk has a permanent decline from the year before to the year after the announcement. Hence, these findings suggest that share repurchase announcements convey information about the riskiness of the firm's assets.

In a study of open market share repurchase announcements in the U.S. market, Bartov (1991) reports evidence suggesting that firms announcing an open market share repurchase, have significantly higher risk compared to their matched control firms for the year prior to the year of the announcement, which is reduced during and after the year of the announcement. Even though the average risk for the repurchasing firms remains marginally, but statistically, higher than the average risk of the control firms during and after the year of the announcement, the evidence points to the fact that open market share repurchase announcements convey information, which leads to a decline in repurchasing firms' risk.

This is supported by Grullon and Michaely (2004) where they examine the six year period surrounding open market share repurchase announcements and they find that repurchasing firms experience a significant decline in their systematic risk, relative to their non-repurchasing peers. Even though this is an indication that their investment opportunities are declining after share repurchase announcements, and thus should be considered as bad news, still, the market has a positive reaction to such news announcements. Therefore, the information content of share repurchases is about the reduction in agency costs. Consequently, since the market is already aware of the decline in potential investment opportunities, share repurchases can be considered as being good news, which in turn could explain the positive market reaction (Grullon and Michaely, 2004). Thus, these findings support the agency costs of the free-cash-flow hypothesis. Furthermore, Oswald and Young (2008) analyse the relationship between the open market share repurchases and firm ownership in the U.K., and find that the level of external shareholder monitoring, as well as the level of managerial ownership have a positive effect on share repurchases. Moreover, when comparing repurchasing firms with non-repurchasing firms that have similar investment and cash flow characteristics, they find that non-repurchasing firms consistently overinvest retained cash when they have a scarcity of investment opportunities. Therefore, suggesting that share repurchases can act as preventive measures against cash retention decisions that could alternatively prove to be costly for shareholders, hence encouraging such payouts. Consequently, because the market already knows that the likelihood of overinvesting is high, then this expectation is reflected by the market's positive reaction to share repurchases.

In contrast, Peyer and Vermaelen (2009) argue that the risk change hypothesis is inconsistent with the abnormal returns that are obtained with Ibbotson's RATS methodology, where monthly adjustments for risk changes after the event are performed. Therefore, if the systematic risk changes after the announcement of a share repurchase, then the coefficients are allowed to change on a monthly basis in order to reflect such risk changes (Peyer and Vermaelen, 2009). Nevertheless, they find excess returns. Therefore, long-term returns cannot be explained as the market's underreaction to risk changes. Moreover, they find that it is firms with the lowest pre-announcement share price performance that had the highest long-term returns. Hence, the authors argue that managers do not necessarily announce a share repurchase because they have private information concerning the firm's future profitability, but

instead, due to the fact that they believe that the firm's current share price does not reflect the true value of the firm. Consequently, a share repurchase announcement does not mean that a firm is undervalued because future performance will improve, but it is undervalued because the market wrongfully believes that the firm's future performance will decline (Peyer and Vermaelen, 2009). Moreover, Denis and Kadlec (1994) perform a thorough examination of potential changes in systematic risk due to fixed price tender offers in the U.S. The authors find that the change in systematic risk following the repurchase is due to estimation bias, rather than reflecting the actual change in risk.

It is notable that Grullon and Michaely (2004) and Peyer and Vermaelen (2009) test if any change in risk occurs by using monthly data. However, there can be a drawback with this estimation method. This is due to the fact that it could not be possible to estimate with a high degree of certainty, if the market follows up the announcement of the repurchase, and more importantly, the actual trades in a timely manner. In addition, in the U.S. there is no time limitation for the initiation and completion of open market share repurchases. Oswald and Young (2008) focus on the U.K. market but investigate the likelihood to execute an actual share repurchase trade from a free cash flow and agency costs perspective, and not the impact that additional firm characteristics have on the actual trades on the completion rates, and more importantly, on the potential effect it can have on a firm's systematic risk.

Moreover, Stephens and Weisbach (1998) report that in the U.S. the announced open market share repurchase programmes are completed, on average, over a period of three years. In contrast, in the U.K. the announced repurchase programmes are valid for a period of eighteen months (Companies Act 1985, article 166 §4; Kim et al., 2004). After this period, if the management wishes to continue the repurchase programme, then it needs to renew its authorisation from its shareholders. Therefore, I argue that by replicating the Grullon and Michaely (2004) methodology for estimating any changes in firms' risk with the implementation of monthly data for the 72 months surrounding the repurchase announcement, it will not be possible to timely and accurately capture any changes in systematic risk for the shorter time period of 18 months. Nevertheless, for comparability reasons I replicate this estimation method for the U.K market in this chapter.

Further, I argue that a firm's total risk could change because the market could follow up on the completion rates, since firms have to report the actual trades.

Therefore, if that is the case, then the market's expectation on the firm's future cash-flows and growth can change, hence, a firm's total risk could change. Nevertheless, the announcement of an open market share repurchase is not a commitment to the firm. Hence, there might not be a significant change on the market's expectation about the future cash-flow and growth expectations, and consequently leading to firms' change in total risk. But since firms in the U.K. are required to report the actual trades on their repurchased shares by the start of the following day after the actual trade took place, the market could follow up on the actual trades, and if the firm is actually moving towards the completion of the announced repurchase programme. Thus, the actual trades could be more informative, and could have a significant influence on the market's expectation concerning the firm's future cash flows. This in turn, can lead to a change on the firm's total risk. Therefore, I replicate my estimations for changes in risk with the employment of daily data, and not only on the announcement, but on the actual trades as well.

Nevertheless, a potential decline in equity betas could be due to a decline in the firm's financial leverage, or a decrease on the firm's underlying riskiness of assets, or finally, due to the information conveyed on the repurchase programme regarding the firms' future performance and profitability (Dann et al., 1991). However, since the net impact of these effects cannot be determined ex ante, in order to take into account the effect that share repurchases can have on leverage and vice versa, I replicate the estimations on risk change with the implementation of Hamada's (1972) approach[14] for robustness check. Hamada (1972) predicts that equity betas are an increasing function of financial leverage, therefore equity betas should increase following share repurchases due to the changes in financial leverage. Even after employing Hamada's (1972) approach the results remain unaltered.

In order to get a better insight on risk changes surrounding share repurchases, I perform a risk decomposition estimation process[15]. In order to do this, within the context of the CAPM, I analyse a firm's total risk (with the assumption that it is based on the portfolio's variance) into two components: the systematic risk and the respective idiosyncratic risk. Therefore, I decompose the total risk for the portfolio of repurchasing companies before and after the repurchase announcement. Finally, I

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[14] Hamada's (1972) approach is explained in detail in the methodology section.

[15] The risk decomposition is performed under the assumption that the common one factor market model applies. For more details see Sharpe (1964), Lintner (1965) and Mossin (1966).

decompose the portfolio's total risk before the repurchase announcement, during the repurchase programme excluding the days where the actual repurchase trades took place, the time period where only the actual trades took place, and the period after the completion of the repurchase programme.

4.3. Data and Methodology

4.3.1. Data and Descriptive Statistics

The sample is constructed by identifying all the announcements of intention to repurchase ordinary shares in the open market from hand-collected data, reported in the news articles posted in *Perfect Analysis* and *Factiva* databases from 1st of January 1997 through 31st of December 2006. These databases report any news announcements that were available in the press, made by U.K. corporations on open market share repurchases.

The sample is refined so as to involve solely those firms that announce their intention to repurchase ordinary shares in the open market, thus excluding announcements concerning the repurchase of B-shares or preference shares. Additionally, I control the sample for American Depositary Receipts (ADRs) and cross-country listings. Furthermore, the firms included in the sample are required to have their share prices listed on *DataStream* and their accounting data on *Worldscope*. Finally, I require firms to include in their repurchase announcement either the dollar value that they are targeting to utilise for their repurchase programme, or the proportion of the common shares outstanding that they plan to repurchase. Hence, the final sample contains 197 announcements of intention to repurchase shares in the open market from corporations primarily listed in the United Kingdom. For these 197 announcements of intention to repurchase I have hand-collected and identified approximately 34,000 actual share repurchase trades.

The announcements containing the actual share repurchase trades are collected by Factiva, which contains all public announcements that are made by the press or any regulatory news service e.g. Dow Jones Newswires, Regulatory News Service (RNS), Financial Times, etc.. Hence, it is possible to accurately measure the number of the repurchased shares and in a timely manner since they are reported on a daily basis[16]. For estimating the completion rate of the announced share repurchase

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[16] It should be noted that for a small sample of ten test firms the total number of repurchased shares has been collected by their respective fiscal year statements in order to validate the completion rates

programme, the total number of the reportedly repurchased shares is divided by the intended amount of shares targeted at the time of the open market share repurchase announcement which has been explicitly stated as a total number of shares, or extrapolated by the firms' market value with the current price at the time of announcement when they stated a target percentage of shares to be repurchased, or extrapolated by the relative value of the shares at the time of the announcement when the firms' announcement targeted a specified monetary value.

Table 4.1 reports the distribution of the open market share repurchase announcements by calendar year. It is clear that the majority of the announcements are located in the second half of the ten year research period, which is consistent with the recent trend and popularity of share repurchases in the United Kingdom. In addition, I find that repurchasing firms are large, since their respective average (median) market capitalisation is $12.76 ($2.15) billion U.S. dollars and the average (median) market-to-book ratio is 2.59 (1.63). Moreover, the average (median) dividend yield for repurchasing firms is 2.98 (2.88). The average size of the sample firms is similar to the average size of repurchasing firms reported in Grullon and Michaely (2004) and Cook et al., (2004), but the respective market-to-book and dividend yield ratios of the sample firms, are slightly higher than the respective values reported in their research.

Table 4.2 reports the average completion rates of the announced repurchase programmes and the ranked percentages out of the total sample firms based on the completion rates. I find that approximately 31% of the firms that have announced their intention to undertake an open market share repurchase programme, have not repurchased any of their shares. In addition I find that 40% of the sample firms repurchase less than 20% of the shares targeted on the announcement and the average (median) completion rate for all repurchasing firms is 74% (54%). This finding is higher than the completion rates reported in Rau and Vermaelen (2002). However, it is similar to the U.S. completion rates of approximately 70% and 80%, respectively reported in Stephens and Weisbach (1998) and Jagannathan et al. (2000). Finally, I find that firms conduct the first actual repurchase trade on average (median) 69 (21) days after the announcement of their intention to repurchase their shares.

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estimated from the collection of the daily actual share repurchase trades and they show no significant statistical differences.

Table 4.1 Yearly distribution of firm characteristics and their completion rates.
This table reports the number of share repurchasing firms on a yearly basis and the respective proportion of the overall sample for 1997 to 2006. In addition, the table reports the average and median values per annum of the completion rates of the intended amount targeted at the time of the repurchase announcement and the respective values of size (MKTCAP), valuation (MKBK) and dividend payout (Div Yield). MKTCAP is defined as the market capitalisation at the year end prior to the repurchase announcement. MKBK is defined as the market-to-book ratio at the year end prior to the repurchase announcement. Div Yield is defined as the dividend yield at the year end prior to the repurchase announcement.

Year	No.	(%) of Total Sample	Completion Rates (%)		MKTCAP ($bn)		MKBK		Div Yield	
			Mean	Median	Mean	Median	Mean	Median	Mean	Median
1997	6	3%	62.97	62.97	2.80	3.30	2.21	1.72	3.99	3.90
1998	14	7%	47.34	41.59	13.78	3.33	1.62	1.01	3.84	4.36
1999	12	6%	34.55	24.68	16.47	3.24	1.77	1.27	2.80	2.80
2000	11	6%	93.32	60.83	4.13	2.51	1.78	1.54	4.30	3.09
2001	23	12%	62.47	62.70	18.66	0.33	1.95	1.00	2.84	2.31
2002	30	15%	45.42	18.73	7.59	1.01	2.99	2.13	3.22	3.52
2003	14	7%	60.67	71.73	10.27	0.45	2.07	1.04	3.03	2.82
2004	29	15%	85.29	65.59	12.37	2.59	2.59	1.60	3.74	4.16
2005	31	16%	89.55	53.21	16.90	2.88	3.73	2.22	2.19	2.34
2006	26	13%	102.87	98.24	15.37	2.02	3.35	2.42	2.35	2.22
Total	**196**	**100%**	**74.33%**	**50.77%**	**12.76**	**2.15**	**2.59**	**1.63**	**3.06**	**3.13**

Table 4.2 Share repurchase completion rates in the United Kingdom.
This table reports the statistics for the completion rates and the number of days from the day of the announcement to the day of initiation of the announced share repurchase programmes, for the total of 197 sample firms for 1997 to 2006. In addition, the table reports the number and percentage of firms from the sample of firms that have actually repurchased their shares (Repurchasing) and those that have not repurchased any of their shares (Non-Repurchasing), as well as the cumulative share repurchase activity in percentiles.

	Difference in days of initiation	Completion Ratio
Mean	69.32	74.17%
Median	21.00	54.00%
Repurchasing firms	136 (69.39%)	
Non-Repurchasing firms	60 (30.61%)	
Total	**196 (100%)**	

Percentiles	Pct of Firms
<20	52%
21-40%	7%
41-60%	10%
61-80%	6%
>81%	25%

4.3.2. Methodology

In order to test the market-timing, and alternatively, the price-support hypotheses, in the spirit of Ginglinger and Hamon (2007), I examine the share prices surrounding the share repurchase announcement and the actual trades. In order to do so, I compute the daily value weighted average price, estimated as the average price obtained from the daily high and low price, weighted by the daily trading volume of the stock[17]. Afterwards, I compare the relative weighted average price paid for the actual repurchase trades to the respective non-repurchase days. For the weighted-average price paid during the non-repurchase days, I use the time periods of n months. Where n takes the values of 1, 2, 3, 4, 6 and 12, before and after each actual repurchase trade takes place (excluding other repurchase days in between). Then, I compute and analyse the ratio of the reported value weighted average price paid on the repurchase day (VWAPR) over the value weighted average price of the remaining days where no repurchase trades took place during each time period under investigation (VWAP), for the n months prior and post the actual trade (VWAPR / VWAP (n)). Then, I compare it with the ratio of the value weighted average price (VWAPNR) of the days that the actual trades took place but excluding the repurchase trades, and divided by the value weighted average price over the same set of time windows before and after the n months the actual repurchase trades took place (VWAPNR / VWAP (n)). Afterwards, I test whether these two ratios are significantly different.

For estimating if the risk changes in the portfolio of companies that have announced their intention to repurchase their shares, I follow two approaches. In the first approach, I estimate the systematic risk for the portfolio of repurchasing companies, by employing the one factor market model based on the CAPM. I estimate the same model by calculating the daily returns before and after the event day (-1 to +1). Individual daily stock prices and daily index prices are collected from *Thomson DataStream*, for a period of 251 trading days before and 251 trading days after, relative to each announcement. The FTSE All Share index is used as a proxy for the market returns. Logarithmic returns are then calculated for each stock and the index. Hence, the mathematical expression of the equities' systematic risk is the following:

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[17] I replicate this estimation with the calculation of the equally-weighted average price and the results remain unaltered.

$$r_{it} = a_{it} + \beta r_{mt} + e_{it} \qquad (4.1)$$

where, r_{it} is the return of stock i at time t, α is the intercept, β the market coefficient, r_{mt} is the market index return i at time t, and e_{it} is the error term with the usual properties. The above equations are estimated for the pre-event period (day -251 to day -2) and the post-event period (day +2 to day +251) separately. I apply this estimation model on the announcement day of the repurchase programme as being the event period. According to Hamada (1972) the equity betas are an increasing function of the financial leverage as depicted below in equation (4.2).

$$\beta_e = \beta_a + (\beta_a - \beta_d) \, (D/E) \qquad (4.2)$$

where, β_e is the equity beta (systematic risk of the firm), β_a and β_d is the beta of the asset and the debt respectively, whereas D/E is the firm's debt-to-equity ratio (financial leverage). Assuming that the beta of the debt is zero and the asset betas remain constant, then the change in the equity beta should be associated with the change in capital structure which is expressed in the following equation:

$$\Delta\beta_e = \beta_a \, \Delta(D/E) \qquad (4.3)$$

Therefore, according to Hamada's (1972) model, equity betas should increase following share repurchases. In order to determine if any changes in equity betas surrounding share repurchase announcements are not simply a reflection of changes in capital structure, I perform the following procedure for robustness check. First, each firm's asset beta is estimated prior to the repurchase announcement. I then compute the change in the firm's debt-to-equity ratio from the end of year prior to the announcement, to the end of year following the share repurchase announcement. Then, I compare the new equity beta (re-levered asset beta) following the announcement with the initially estimated post-announcement beta from the OLS regression from equation 4.1, and I find that the two betas are quite similar. In sum, even after correcting for potential biases in beta estimates, the results and conclusions on the magnitude of changes in beta after the share repurchase announcement remain unaltered.

In addition to the test sample of firms that have announced an open market share repurchase, I construct a control sample using two matching methods, that yield a size matched control sample, and a market-to-book matched control sample. For the control firms, I apply a random selection following a uniform distribution (in order to avoid potential selection bias) and on a one-to-one basis, meaning that for every sample firm there is an equivalent and unique control firm. The control firms need to fulfil the following criteria in order to be selected. First, following Bartov (1991) for the size matching method, they need to have the same two-digit SIC industry code, thus controlling for industry effects, and their respective market value needs to fall within a twenty percent range above or below the respective level of each sample firm at the end of the year prior to the repurchase announcement. Second, for the MKBK matching method, they need to have the same two-digit SIC industry code, thus controlling for industry effects, and their respective market-to-book ratio needs to fall within a twenty percent range above or below the respective level of each sample firm at the end of the year prior to the repurchase announcement, thus controlling for any undervaluation.

In the second approach for estimating the systematic risk changes, following Grullon and Michaely (2004), I apply the simple market model and replicate the same estimation with the employment of the Fama-French (1993) three factor model. For each firm that has announced its intention to repurchase its shares in the open market, I estimate the monthly regressions for the three years prior to the month of the announcement *(t₀-36)* and for the three years after the month of the announcement *(t₀+36)*. The two market models are mathematically expressed as follows:

$$r_{it} - r_{ft} = \alpha_{-i} + a_{\Delta i} D_t + b_{-i}\left(r_{mt} - r_{ft}\right) + b_{\Delta i} D_t\left(r_{mt} - r_{ft}\right) + e_t \qquad (4.4)$$

$$r_{it} - r_{ft} = \alpha_{-i} + a_{\Delta i} D_t + b_{-i}\left(r_{mt} - r_{ft}\right) + b_{\Delta i} D_t\left(r_{mt} - r_{ft}\right) + s_{-i} SMB_t +$$
$$s_{\Delta i} D_t SMB_t + h_{-i} HML_t + h_{\Delta i} D_t HML_t + e_t \qquad (4.5)$$

where, r_{it} is the monthly return on stock *i*, r_{ft} is the monthly return on three-month U.K. Treasury Bill, r_{mt} is the monthly return on the FTSE All shares index, and D_t is a dummy variable that takes the value of one if $t{\geq}t_0$ and zero otherwise, where t_0 is the month of the repurchase announcement. SMB_t is the difference between the monthly

return of a small firms portfolio from a portfolio of large firms. HML_t is the difference between the monthly return of a portfolio of high book-to-market firms from a portfolio of low book-to-market firms. For estimating SMB_t, FTSE 100 index is used as a proxy for large firms' portfolio and FTSE Small Cap index is used as a proxy for small firms' portfolio. For estimating HML_t, FTSE 350 Value index is used as a proxy for a low market-to-book firms' portfolio and FTSE 350 Growth index is used as a proxy for a high market-to-book firms' portfolio.

In addition, following Grullon and Michaely (2004) I replicate the two models by calculating an adjusted measure of risk, where I control for any systematic evolution of risk. I accomplish this by employing two sets of control firms constructed with the industry-size and industry-MKBK matching methods, as discussed earlier. The adjusted measure of risk, is equal to the estimated factors for the sample firms (repurchasing), subtracting the estimated factors for the control firms (non-repurchasing).

Additionally, in order to examine the possible changes in the risk of repurchasing firms, I employ a risk decomposition approach within the CAPM context. In the context of Sharpe (1964), Lintner (1965) and Mossin (1966) the risk decomposition is based on variance (σ^2). Hence, the risk decomposition is expressed as:

$$\sigma_{r_i}^2 = \beta_{m_i}^2 \sigma_{r_m}^2 + \sigma_{e_i}^2 \qquad (4.6)$$

where $\sigma_{r_i}^2$ is the total risk, $\beta_{m_i}^2 \sigma_{r_m}^2$ is the market component (systematic risk) of total risk and $\sigma_{\varepsilon_i}^2$ is the idiosyncratic (firm specific) risk component. In detail, total risk is defined as the variance of an equally weighted index of all stock returns, while market risk is defined as the variance of an equally weighted index of the returns of the index. The market risk coefficient and the idiosyncratic risk component for each firm are obtained by employing equation (4.1). The betas are then squared and averaged across firms while the variance of the average residuals is used as a measure of idiosyncratic risk.

4.4. Empirical evidence

4.4.1. Market-Timing

According to the market timing hypothesis, the firm's share price should be lower during repurchase days, compared to subsequent non-repurchase days. Whereas the price support hypothesis implies that the firm's share price should be lower during repurchase days, compared to prior non-repurchase days (Ginglinger and Hamon, 2007). Therefore, in order to test these hypotheses, I compute the value weighted average price paid relative to the value weighted average price over a set of time windows before and after the actual repurchase trades took place VWAPR/VWAP(n months). Then, I compare it with the ratio of the value weighted average price of the days that the actual trades took place – excluding the repurchase trades – relative to the value weighted average price over the same set of time windows before and after the days the actual repurchase trades took place VWAPNR/VWAP(n months). It should be noted though that according to the regulatory framework in the United Kingdom, firms are not allowed to repurchase their shares at a price that is higher than 5% above the average market value of the company's shares for the 5 <u>business days</u> prior to the day the repurchase is made[18]. This can limit firms' flexibility on timing their repurchase trades in the case where their incentive is to provide price support. Nevertheless, firms still have some level of flexibility for timing the actual repurchase trades when their motive is to either exploit any potential undervaluation or to provide price support.

The results from the VWAPR ratios analysis are reported in Table 4.3. Panel A reports the VWAPR ratios for the days prior to the repurchases and Panel B reports the VWAPR ratios estimated for the period after the repurchases took place. For the period prior to the repurchases, I find that the VWAPR/VWAP(1 month) for the actual trades is significantly higher (17.9%) than the respective VWAPNR/VWAP(1 month) ratio for the repurchase days excluding the actual trades, for the period prior to the repurchases. Similarly, for the short-term period of two and three months prior to the repurchases I find that the VWAPR ratio is significantly higher by 19.1% and 17.9% respectively, compared to the VWAPNR ratio.

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[18] For more details please see the FSA Handbook, L.R. 12.4.

Table 4.3 Univariate tests of strategic trading.

The sample consists of 136 firms that were subject to at least one share repurchase transaction over the period 1997 to 2006. The value weighted average price is calculated as the average price obtained from the daily high and low price, weighted by the daily trading volume of the stock. Then the relative value weighted average price paid for the actual repurchase trades to the respective non-repurchase days is compared. For the value weighted average price paid during the non-repurchase days, the time periods of n months (excluding other repurchase days in between) are used. Then the ratio of the reported average price paid on the repurchase day (VWAPR) over the value weighted average price of the non-repurchase days (VWAP) for the n months prior and post the actual trade (VWAPR / VWAP (n)) is computed. Finally, it is compared with the ratio of the value weighted average price (VWAPNR) of the days that the actual trades took place (excluding the repurchase trades) divided with the value weighted average price over the same set of time windows before and after the n months the actual repurchase trades took place (VWAPNR / VWAP (n)). Panel A. reports the results for the n months prior to the repurchases. Panel B. reports the equivalent results for the n months after the repurchases. For the difference in means the t-test p-values are reported. For the differences in medians the Wilcoxon/Mann-Whitney test p-values are reported. [***], [**], and [*] indicate statistical significance at the 1, 5 and 10% level respectively, based on the p-values.

Panel A.	VWAPR/VWAP (with Actual trades) mean (median)	VWAPNR/VWAP (without actual trades) mean (median)	Difference in means (p-value)	Difference in medians (p-value)
1 month pre	1.156	0.977	0.179[*]	0.003
	(0.988)	(0.985)	(0.055)	(0.177)
2 months pre	1.168	0.978	0.191[**]	0.020[*]
	(1.000)	(0.980)	(0.045)	(0.095)
3 months pre	1.153	0.974	0.179[*]	0.020
	(0.991)	(0.972)	(0.056)	(0.115)
4 months pre	1.158	0.972	0.186[**]	0.021[*]
	(0.987)	(0.966)	(0.046)	(0.085)
6 months pre	1.099	0.963	0.137[*]	0.021[*]
	(0.989)	(0.968)	(0.062)	(0.094)
12 months pre	1.103	0.972	0.131[*]	0.014
	(0.991)	(0.977)	(0.092)	(0.122)

Panel B.	VWAPR/VWAP (with Actual trades) mean (median)	VWAPNR/VWAP (without actual trades) mean (median)	Difference in means (p-value)	Difference in medians (p-value)
1 month post	1.050	0.958	0.092	0.039
	(0.890)	(0.851)	(0.278)	(0.181)
2 months post	1.044	0.951	0.093	0.039
	(0.897)	(0.858)	(0.252)	(0.167)
3 months post	1.042	0.945	0.097	0.050
	(0.905)	(0.855)	(0.209)	(0.131)
4 months post	1.033	0.935	0.097	0.047
	(0.909)	(0.862)	(0.183)	(0.123)
6 months post	1.031	0.931	0.100	0.046
	(0.914)	(0.868)	(0.149)	(0.113)
12 months post	1.040	0.931	0.109[*]	0.021[*]
	(0.913)	(0.892)	(0.088)	(0.095)

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The results remain the same for the extended period of four, six and twelve months, where the differences in means of the VWAPR ratios remain significantly higher (by 18.6%, 13.7% and 13.1% respectively), compared to the non-repurchase days of the VWAPNR ratio for the repurchase days excluding the actual trades. When looking at the VWAPR ratios estimated for the post-repurchase period in Table 4.3. Panel B, I find that it is only for the twelve month period that the VWAPR for repurchase days is significantly higher (by 1.09%) compared to VWAPNR for the post non-repurchase days.

Even though the results show that the VWAPR(n) ratios for the reported prices paid for the actual repurchases are significantly higher than the VWAPNR(n) ratios for the n months prior to the repurchases, I argue that the results still provide support for the price support hypothesis. These results show that managers are willing to pay a higher price for the actual repurchases compared to the firm's value weighted average price of prior non-repurchase days, hence trying to support the price on the market itself by offering a higher price. Also with their willingness to pay a higher price they signal to the market that they believe that the firm's current share price should be higher, and even though they are paying a higher price they still believe that the current price paid could be a bargain for them. Hence, I conclude that the managerial incentive for undertaking the actual repurchases is price support rather than market timing.

However, these results contradict the findings of De Cesari et al. (2009), where they report that firms in the U.S., repurchase shares at relatively lower prices and that they tend to repurchase more shares during months when the prevailing market prices are relatively low. Nevertheless, the authors employ monthly data which could be one of the reasons that lead to the difference in the findings of timing ability, along with the difference in cultural and institutional differences between the U.S. and the U.K. markets. Moreover, the interpretation of these findings is still consistent with the findings of Ginglinger and Hamon (2007) where they conclude that the incentive for the actual repurchases is price support.

4.4.2. The determinants of share repurchase completion rates

Next I consider the factors that influence the completion rates of the announced share repurchase programmes. In order to test which factors and firm characteristics

have a significant impact on the completion rate of the announced open market share repurchase programmes, the following cross-sectional regression is estimated:

$$CR_i = \beta_0 + \beta_1 SIZE_{i(t-1)} + \beta_2 MKBK_{i(t-1)} + \beta_3 ER_{i(t-1)} + \beta_4 \Delta ER_{i(t)} +$$
$$\beta_5 LVG_{i(t-1)} + \beta_6 \Delta LVG_{i(t)} + \beta_7 CF_{EXP_{i(t-1)}} + \beta_8 CF_{UN_{i(t)}} + \beta_9 OWN\ CON_{i(t-1)} +$$
$$\beta_{10} \Delta OWN\ CON_{i(t)} + \beta_{11} DIV\_Y_{i(t-1)} + \beta_{12} \Delta DIV_{i(t)} + \beta_{13} DIV/NI_{NI_{i(t-1)}} +$$
$$\beta_{14} REP_{i(t)} + \beta_{15} DAY\_DIF_{i(t)} + e_{it} \tag{4.7}$$

Where t represents time measured by the calendar year end when the share repurchase announcement took place, and CR is the percentage of the actually repurchased shares relative to the amount targeted at the time of the announcement, for company i, and e is the error term. In order to control for firm size, following Rau and Vermaelen (2002), I include the proxy variable $SIZE$, which is the natural logarithm of total assets for firm i at the year end prior to the repurchase announcement. By including the size proxy I also capture the firm's information environment (Brockman and Chung, 2001). Moreover, Ikenberry et al., (2000) argue that smaller firms have less scrutiny and are less efficiently priced. Hence, I expect to find that firm size has a negative relationship with the completion rate of the announced share repurchase programme.

Assuming that undervaluation has a significant influence on managers' decision to repurchase, I expect to find that stock price movements have a significant impact on the decision to repurchase, and consequently, on the respective completion rates. In order to test the hypothesis that undervaluation plays an important role that leads managers to repurchase shares, I include $MKBK$ in the analysis, which is the ratio of market value for each company i to its respective book value of assets at the year end, when the repurchase announcement took place. According to the information asymmetry and the undervaluation hypotheses, I expect to find a negative relationship between the market-to-book ratio ($MKBK$) and the completion rates, because a low $MKBK$ value would suggest that the firm is undervalued, whereas a high $MKBK$ ratio would suggest that the market value is reflecting the true fundamental value of the firm. If undervaluation is an important motive for executing share repurchases, then one would expect to find that value firms will have higher completion rates compared to growth companies Ikenberry et al. (2000).

If managers are trading strategically in order to take advantage of potential undervaluation, then an increase in stock prices should deter them from buying back shares, whereas a decline in prices should lead to an increased motivation for repurchasing shares. Nevertheless, I have previously found evidence suggesting that managers' motivation for trading is price support. Therefore, one would expect managers to trade when the company's share prices are decreasing and not when they are increasing. Therefore, in order to test if managers repurchase shares because they believe the share price is undervalued, following Cook et al. (2004) I include the proxy variable *ER* which is the cumulative excess return of firm *i* relative to the FTSE All Share index for the period of 255 to 2 days prior to the announcement . Moreover, since the change on the firm's share price during the implementation of the repurchase programme would alter the attractiveness for the actual share repurchase trades, in the spirit of Ikenberry et al. (2000) I include the proxy variable *ΔER* which is the change in the cumulative excess return for the period of 255 to 2 days following the day of the announcement relative to the cumulative excess return for the period of 255 to 2 days prior to the announcement. If managers' motive for repurchasing is price support, then I expect to find a positive relationship between *ER* and *ΔER* with the completion rates. Alternatively, if managers trade strategically in order to exploit the firm's undervaluation, then I should find a negative relationship between *ER* and the completion rates.

Furthermore, if a firm has excess debt capacity, then it can utilise it by increasing its debt levels and funnelling the extra funding as a payment to its shareholders in the form of share repurchases. Consequently, this will lead to higher completion rates of the announced share repurchase programmes. Hence, I argue that firm leverage can have a significant impact on share repurchasing. Following Grullon and Michaely (2002), I proxy for leverage with the variable *LVG* which is defined as firm's *i* total debt to its book value of total assets at the year end prior to the announcement of the repurchase programme. I expect to find that the firms' leverage ratio will be negatively related to the repurchase completion rates, suggesting that the lower leverage, the more financial flexibility a firm has either to adjust its capital structure or to increase its debt levels in order to finance its payout programme. Furthermore, in order to capture the effect that any changes in a firm's leverage exposure can have on the repurchase completion rates, I include the proxy variable *ΔLVG,* which is the change in a firm's leverage at the year end after the

announcement of the repurchase programme, relative to the respective leverage exposure at the year end prior to the announcement. I expect to find a positive relationship between the proxy ΔLVG and the completion rates, suggesting that firms are taking more debt in order to repurchase the intended shares. This, in turn, can be interpreted as firms using share repurchases in order to achieve their optimal leverage ratio and restructure their capital.

Brockman and Chung (2001) argue that firms with relatively large cash flows will be more likely to distribute the extra cash to their shareholders via share repurchases, and therefore being less likely to repurchase due to underpricing as being a strong motive. In addition, firms will varyingly adjust the execution of the announced share repurchase programme depending on their cash flow position, leading to varying repurchase completion rates. In addition, Guay and Harford (2000) and Bartram et al. (2009) find evidence that share repurchases are associated with temporary and unsustainable cash flows. In addition, Oswald and Young (2008) compare non-repurchasing firms that have similar investment and cash flow characteristics with repurchasing firms in the U.K. market, and find that non-repurchasing firms are more likely to overinvest. This suggests that firms that experience unexpected earnings are more likely to repurchase more of their shares.

Hence, I follow Stephens and Weisbach (1998) and I include two proxy variables for measuring a firm's cash flow levels. The first proxy is the expected cash flow (CF_{EXP}), which is defined as firm's i income before extraordinary items plus depreciation expense, divided by its total assets at the year end prior to the announcement of a share repurchase programme. The second proxy is the unexpected cash flow (CF_{UN}), which is defined as the change of firm's i cash flow at the year end following the repurchase announcement relative to its cash flow to the year end prior the repurchase announcement. I expect to find a positive relationship for both cash flow proxies with the completion rates, suggesting that firms repurchase their shares when they experience positive past cash flows and the respective completion rates will be even higher when firms experience positive unexpected cash flows following the announcement of the repurchase programme. In the spirit of Stephens and Weisbach (1998), even though a firm has expectations on future cash flows, still they can differ significantly from the actual realised unexpected cash flow which will result into different levels of cash utilisation and payouts.

It has been widely discussed in the literature that when a company's existing capital exceeds its potential investment opportunities, the firm can either retain the excess cash or distribute it back to its shareholders in order to reduce the potentially arising agency costs (Easterbrook, 1984; and Jensen, 1986). Further, as argued by Shleifer and Vishny (1997), agency costs are incurred between the controlling and the minority shareholders. Thus, the higher the ownership concentration, the less it is possible for minority shareholders to influence the firm's decision making. Therefore, controlling shareholders can wreak substantial costs to other shareholders by redistributing the firm's wealth. Consequently, the lower the ownership concentration the more it is possible for the minority shareholders to influence a firm's decision making on the excess cash utilization. This is in line with Jensen and Meckling (1976), who argue that if the costs are lower than the benefits from reducing the respective agency costs, then it could be for the management's benefit to repurchase shares in the market and reduce ownership dispersion. In addition, Bartram et al. (2009) find evidence that the higher the ownership concentration, the more likely it is for a firm to choose dividends as a payout method instead of repurchases. Moreover, Oswald and Young (2008) find that ownership concentration in the U.K. market has a significant impact on the decision to repurchase, and the higher the ownership concentration the higher will be the propensity for a firm to actually repurchase its shares.

Hence, I expect to find that a firm's completion rate of the intended repurchase programme will be associated with a firm's ownership concentration level, as a consequence of the pressure applied from the minority shareholders for reducing potential agency costs. In order to test this, following Mitchell and Dharmawan (2007) and Bartram et al. (2009) I use as a proxy for the level of ownership concentration the variable ($OWN\ CON$), which is the percent of closely held shares divided by the number of total common shares outstanding at the year end prior to the repurchase announcement. In addition, I include the variable ($\Delta OWN\ CON$) which is the change in the level of ownership concentration at year end after the open market share repurchase announcement, relative to the respective level at the year end prior to the share repurchase announcement. I expect to find a negative coefficient for ($OWN\ CON$), suggesting that the lower the ownership concentration, the higher the completion rate will be, and the larger the decrease (increase), the higher (lower) the

completion rate will be from the resulting shift in influence of the minority shareholders on the firm's distribution of its excess cash flows.

According to the dividend substitution hypothesis, firms repurchase their stock as an alternative way of distributing their excess cash to their shareholders. Share repurchases can be more tax efficient and can be more valuable (from a tax perspective) for shareholders than a dividend payout when capital gains are taxed at a lower rate compared to the personal income tax rate (Grullon and Michaely, 2002). Hence, in order to test if the tax flexibility of share repurchases has a significant impact on managers' incentive to repurchase and consequently to the respective share repurchase completion rates, in the spirit of Mitchell and Dharmawan (2003) and McNally (1999) I proxy for the average tax rate of their shareholder clienteles with *DIV_Y* which is the dividend yield ratio for each firm *i* at the year end prior to the announcement of the repurchase programme. In addition, for testing the substitutability of dividends by share repurchases, I include the proxy variable *(ΔDIV)* as in Grullon et al. (2002), which is defined as the yearly change of cash dividends at the year end following the repurchase announcement, relative to the firm's previous year cash dividends. If share repurchases are substitutes to dividends, then I expect to find a negative relationship between these two variables and the respective completion rates, suggesting that firms prefer to distribute their excess cash flow through share repurchases. Finally, for the substitutability of dividends and the tax advantage, following Dittmar (2000) and Swaminathan et al. (2002), I employ the proxy variable *DIV/NI* which is defined as the ratio of common cash dividends relative to the reported net income for each firm *i* at the year end prior to the open market share repurchase announcement.

Finally, I include two additional control variables in the cross sectional analysis. The first control variable is the dummy variable *REP* that takes the value of one if the firm has made previously a open market share repurchase announcement during the ten year period under study, and zero otherwise. Ikenberry et al. (2000), report that in their sample a number of firms had consecutive repurchase programmes. Moreover, they argue that managers in these firms could behave opportunistically and repurchase shares only when their respective prices are falling. Therefore, these firms should have lower completion rates, since their motive for share repurchasing is this opportunistic and strategic trading and not the distribution of the excess cash to their shareholders. Hence, I expect to find a negative relationship between the dummy

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variable *REP* and the completion rates of the announced share repurchase programmes.

The second additional control variable is the *DAY_DIF* proxy, which is the number of days from the day of the announcement to the initiation of the repurchase programme. I argue that if firms are not trading strategically and their primary goal for undertaking a share repurchase is to give their excess cash back to their shareholders, then I would expect to see firms commencing the open share repurchase programme as early as possible, without any delays. Therefore, if a firm starts its repurchase programme as early as possible, this could be taken as the firm's commitment to its repurchase programme. Hence, I expect to find a negative relationship between the completion rates and the variable *DAY_DIF*, suggesting that the sooner a firm initiates the repurchase programme following the announcement the more committed the firm is on initiating and completing the announced payout.

The results from the multivariate analysis are shown in Table 4.4. It should be noted that the correlations between the variables are lower than 0.5, as reported in the correlation matrix reported in Appendix E. Moreover, in cases where independent variables are statistically correlated with one another, auxiliary regressions are employed in order to make them orthogonal.

I find that the existing excess debt capacity *(LVG)* and the change of the firm's respective leverage ratio *(ΔLVG)* both have a positive relationship with firms' repurchase completion rates. This can be interpreted as firms repurchasing more of their shares when they have excess debt capacity prior to the repurchase announcement and they tend to increase their existing debt thus moving closer towards their desired debt level. Additionally, I find that firms that pay higher dividends and have higher tax bracket shareholder clienteles, have higher repurchase completion rates, as indicated by the positive relationship of the completion rates with the respective variables *DIV/NI* and *DIV_Y*. However, I find no evidence of the dividend substitution hypothesis having a strong influence on the completion rates since the change in dividends *(ΔDIV)*, from the time prior to the time post the announcement, is not statistically significant. Rather, the evidence support the notion that share repurchases can be used as supplements to dividends.

Table 4.4 Determinants of share repurchase programmes' completion rates.

This table reports the estimated coefficients of the following cross-sectional regression :

$$CR_i = \beta_0 + \beta_1 SIZE_{i(t-1)} + \beta_2 MKBK_{i(t-1)} + \beta_3 ER_{i(t-1)} + \beta_4 \Delta ER_{i(t)} + \beta_5 LVG_{i(t-1)} + \beta_6 \Delta LVG_{i(t)} + \beta_7 CF_{EXP_{i(t-1)}} + \beta_8 CF_{UN_{i(t)}} + \beta_9 OWN\ CON_{i(t-1)} + \beta_{10} \Delta OWN\ CON_{i(t)} + \beta_{11} DIV\_Y_{i(t-1)} + \beta_{12} \Delta DIV_{i(t)} + \beta_{13} DIV/NI_{NI_{i(t-1)}} + \beta_{14} REP_{i(t)} + \beta_{15} DAY\_DIF_{i(t)} + e_{it}$$

The sample consists of 197 firms in the U.K. that have announced their intention to repurchase their shares and have stated either the proportion of common shares outstanding that were willing to repurchase, or the cash amount they were intending to utilise for the repurchase. *CR* is the completion rate of the announced open market share repurchase programme, defined as the percentage of the actually repurchased shares relative to the intended amount at the time of the announcement. *SIZE* is a firm's natural logarithm of total assets at the year end prior to the time of the announcement. MKBK is the ratio of a firm's market value relative to its book value at the year end prior to the announcement. ER is a firm's cumulative excess return relative to the FTSE All Share index for the period of 255 to 2 days prior to the announcement. *ΔER* is the change in the cumulative excess return for the period of 255 to 2 days following the day of the announcement relative to the cumulative excess return for the period of 255 to 2 days prior to the announcement. *LVG* is a firm's total debt relative to its total assets at the year end prior to the repurchase announcement. *ΔLVG* is the change in leverage from the year end prior to the year end subsequent the announcement. CF_{EXP} is a firm's income before extraordinary items plus depreciation expense, divided by its total assets at the year end prior to the announcement of a share repurchase programme. CF_{UN} is the change of a firm's cash flow at the year end following the repurchase announcement relative to its cash flow to the year end prior the repurchase announcement. *OWN CON* is the percentage of closely held shares divided by the number of total common shares outstanding at the year end prior to the repurchase announcement. $\Delta OWN\ CON$ is the change in the level of ownership concentration at year end after the repurchase announcement relative to the respective level at the year end prior to the repurchase announcement. *DIV_Y* is the dividend yield ratio at the year end prior to the announcement of the repurchase programme. *ΔDIV* is the yearly change of cash dividends at the year end following the repurchase announcement, relative to the firm's previous year cash dividends. *DIV/NI* is the ratio of common cash dividends, relative to the reported net income for each firm at the year end prior to the repurchase announcement. *REP* is a dummy variable that takes the value of one if the firm has previously made a share repurchase during the ten year period under study, and zero otherwise. *DAY_DIF* is the number of days from the day of the announcement to the initiation of the repurchase programme. The standard errors of the coefficients have been adjusted for heteroskedasticity using White's procedure. The p-values of the cross-sectional regressions are reported in parentheses. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively, based on the t-test p-values.

	Dependent Variable: Repurchase Completion Rate			
	Eq.1	Eq.2	Eq.3	Eq.4
C	-1.305	-1.089	-1.420	-0.800
	(0.045)	(0.086)	(0.021)	(0.185)
SIZE	0.075*	0.079**	0.085**	0.083**
	(0.066)	(0.045)	(0.010)	(0.036)
MKBK	0.049	0.049	0.050	0.027
	(0.135)	(0.147)	(0.120)	(0.419)
ER	-0.209	-0.252	-0.189	0.002
	(0.486)	(0.413)	(0.511)	(0.995)
ΔER	0.003	0.002	0.003	0.002
	(0.444)	(0.419)	(0.404)	(0.473)
LVG	1.321**	0.942	1.284**	1.411**
	(0.022)	(0.106)	(0.021)	(0.015)
ΔLVG	0.095*		0.092*	0.036
	(0.081)		(0.094)	(0.489)
CF EXP	-0.441	-0.601	-0.371	-0.089
	(0.577)	(0.479)	(0.643)	(0.899)
CF UN	0.052	0.040	0.043	-0.044
	(0.413)	(0.527)	(0.483)	(0.470)
OWN CON (%)	0.002	0.003	0.002	0.004
	(0.566)	(0.506)	(0.557)	(0.391)
ΔOWN CON	-0.004***	-0.004***	-0.004***	-0.002**
	(0.003)	(0.001)	(0.004)	(0.014)
DIV_Y	0.169**	0.142**	0.169**	
	(0.013)	(0.044)	(0.014)	
ΔDIV	-0.033	-0.043	-0.024	-0.035
	(0.495)	(0.363)	(0.588)	(0.219)
DIV/NI	0.002*	0.002*	0.002***	0.002**
	(0.054)	(0.070)	(0.001)	(0.046)
REP	0.100	0.047		0.028
	(0.617)	(0.818)		(0.886)
DAY_DIF	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R^2 (%)	*23.65*	*17.86*	*24.25*	*11.23*

Concerning the influence of ownership concentration to the completion rates, I find that firms that are becoming more widely owned, by decreasing the holdings owned by the majority shareholders, have higher repurchase completion rates. This shows that when firms are becoming more widely held then the minority shareholders

attain greater influence on management's decision for the firm's cash utilisation, and subsequently, on the firm's payout and share repurchase programmes completions. Moreover, and consistent with my expectations, I find that firms that have smaller time intervals between the time of the announcement and the repurchase programme initiation, have higher completion rates. This shows that firms, which are truly committed on materialising their intention to return their excess cash back to their shareholders through a share repurchase, initiate the open market share repurchase programme as soon as possible.

Furthermore, I find that larger firms have higher completion rates on the announced share repurchase programme, as denoted by the positive coefficient of *SIZE*. This is contrary to my expectations and the findings of Ikenberry et al. (2000), where they report evidence of a negative relationship between firm size and the respective completion rates. Nevertheless, the results on size are consistent with the findings of Jagannathan and Stephens (2003) where they report a positive relationship between size and share repurchase frequency. The interpretation of the positive relationship of size with the completion rates, is that firms do not repurchase their shares due to their potential undervaluation (since larger firms have lower information asymmetries and hence are more efficiently priced), but due to the fact that they are already large firms with lower growth opportunities. Consequently, these firms repurchase their shares in order to reduce potential agency costs.

In addition, I find no evidence of undervaluation having an influence on the repurchase completion rates, since the proxy variables *MKBK*, *ER* and *ΔER* are not statistically significant. Moreover, the fact that the market-to-book ratio has no impact on the completion rates of the announced open market share repurchase programmes is consistent with the findings of Dittmar and Dittmar (2008), where they find no evidence that past or future market-to-book ratios have any effect on repurchase activity. Finally, I find no evidence of the excess cash flow having a significant influence on a firm's repurchase programme completion rate, as well as no evidence of a relationship between the completion rates and a repetition of a repurchase programme.

In sum, I find that large firms with lower excess debt capacity that pay out dividends and decrease their ownership concentration after the share repurchase announcement, and especially those firms that initiate the announced repurchase

programme as soon as possible after the announcement, are more likely to have higher share repurchase completion rates.

4.4.3. Risk Change and Risk Decomposition

When a firm announces and undertakes a share repurchase programme, it can usually fund this programme by increasing its leverage and/or by using its excess cash flow. If a firm uses leverage, this can be associated with a firm's increase in systematic risk. Nevertheless, if managers knowingly increase leverage because they anticipate that their firm's risk will decline, then the market will recognise this, thus leading to a reduction of the firm's stock risk (Brav, 1991). If a firm uses its excess cash flow to fund its share repurchase programme that could mean that the firm experiences a reduction in investment opportunities, which could be considered as bad news. In general, good news is on average associated with a decline in systematic risk, whereas bad news is associated with an increase in systematic risk (Berk et al., 1999). Nevertheless, the market could still be aware of the firm's existing decline in investment opportunities, thus the reduction in excess cash can lead to a reduction of management's likelihood of overinvesting. Therefore, share repurchases can convey information to the market that can be associated with a reduction in systematic risk (Grullon and Michaely, 2004). In this section, I report evidence on risk related information conveyed to the market through share repurchases.

Table 4.5 reports the summary statistics on the comparison of the observed common stock betas and the respective risk changes before and after the repurchase announcement, for the repurchasing firms as well as for the control firms selected with both matching methods (industry-size and industry-mkbk). I find that repurchasing firms experience a marginal decline in systematic risk after the announcement, but it is not statistically significant. Similarly, I do not find evidence of a decline in systematic risk for the non-repurchasing firms. The evidence I get so far is contradicting the findings reported in Bartov (1991), where a statistically significant decline in the average beta is reported during the year of the repurchase announcement. Nevertheless, these results are aligned with Denis and Kadlec (1994) where they find no evidence of a firm's systematic risk declining after a fixed price tender offer repurchase, after controlling for potential estimation bias.

Table 4.5 Repurchase announcement effect on risk change (daily returns).

This table reports the mean and median estimated systematic risk (β parameter of the market model) for the test sample as well as the control samples constructed with the industry-size and industry-mkbk matching methods. The test sample consists of 132 firms in the U.K. that have announced their intention to repurchase their shares. The industry-size and industry-mkbk control samples consist of 80 and130 firms respectively. The systematic risk is estimated using the daily stock returns and equally weighted market returns for the periods of -255 to -2 days (prior-period) and for +2 to +255 days (post-period) relative to the day of the repurchase announcement. Only firms with a minimum of fifty daily returns in each of the two periods were included. Δβ is the difference between the beta of each company for the year prior to the year subsequent the announcement. For the difference in means the t-test p-values are reported in parentheses. For the differences in medians the Wilcoxon/Mann-Whitney test p-values are reported. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively based on the p-values.

Repurchase announcement effect on risk change

Period relative to the repurchase announcement		(1) Test Sample β	(2) Control Sample (Industry-Size-Matched) β	(3) Control Sample (Industry-MKBK-Matched) β	(1) - (2) Δβ test and size-matched control samples	(1) - (3) Δβ test and mkbk-matched control samples
Prior	mean	0.628	0.557	0.330	0.071 (0.239)	0.298*** (0.000)
	median	0.620	0.413	0.211	0.207 (0.109)	0.410*** (0.000)
Post	mean	0.623	0.605	0.380	0.017 (0.7814)	0.242*** (0.000)
	median	0.615	0.587	0.268	0.028 (0.741)	0.347*** (0.000)
Δβ (Prior - Post)	mean	0.005 (0.911)	-0.049 (0.528)	-0.050 (0.290)		
	median	0.006 (0.788)	-0.173 (0.415)	-0.057 (0.184)		

However, I find that repurchasing firms experience a statistically significant higher risk, compared to their peers of similar valuation as captured by the market-to-book ratio for both *ex-post* and *ex-ante* periods, relative to the open market share repurchase announcement. Even though, I do not find any evidence that share repurchase announcements convey risk related information to the market, I find that repurchasing firms are already experiencing a higher risk compared to non-repurchasing firms of the same industry and similar valuation. This means, that the market already recognises that repurchasing firms are already experiencing a possible decline of investment opportunities, hence the market believes that these firms belong to a higher risk bracket, compared to their matched peers of similar valuation.

To further investigate whether the announcement for an open market share repurchase conveys risk related information to the market, I follow Grullon and Michaely (2004) and measure the unadjusted and adjusted changes in risk, as captured by firms' betas in the one factor market model, and the changes in risk and the factor loadings estimated with the Fama and French (1993) three factor model. The results shown in Table 4.6 confirm that there is no significant change in firm risk after the share repurchase announcement, as captured by the firm betas. For the entire samples however, for both the unadjusted and adjusted measures of risk, I find that it is only the change in the SMB beta that is significantly higher after the share repurchase announcement.

The positive change in the SMB beta suggests that after a repurchase announcement, firms behave more like growth firms rather than large and mature firms, which prefer to make a payout to their shareholders through share repurchases in the open market, which are more flexible to undertake. This is also confirmed, when analysing firms that pay dividends per share lower than the median of the entire sample, where the change in market risk is significant as well as the SMB loading factor, where it is positive and significant.

The same applies as well in the MKBK matching method on the adjusted measure of risk in Panel B, where firms paying lower dividends have a significant decline in risk for the single factor market model and a positive and significant SMB factor loading. In sum, I find that firms paying lower cash dividends experience a decline in risk and retain the behaviour of a growth company rather than that of a large and mature company, since they prefer to undertake a share repurchase.

Table 4.6 Repurchase announcement effect on risk change (monthly returns).

This table reports the cross-sectional mean and median values of the estimated coefficients of the simple market model:

$$r_{it} - r_{ft} = \alpha_{-i} + a_{\Delta i}D_t + b_{-i}\left(r_{mt} - r_{ft}\right) + b_{\Delta i}D_t\left(r_{mt} - r_{ft}\right) + e_t$$

and the Fama-French (1993) three factor model:

$$r_{it} - r_{ft} = \alpha_{-i} + a_{\Delta i}D_t + b_{-i}\left(r_{mt} - r_{ft}\right) + b_{\Delta i}D_t\left(r_{mt} - r_{ft}\right) + s_{-i}SMB_t +$$
$$s_{\Delta i}D_tSMB_t + h_{-i}HML_t + h_{\Delta i}D_tHML_t + e_t$$

where, r_{it} is the monthly return on stock i, r_{ft} is the monthly return on three-month U.K. Treasury Bill, r_{mt} is the monthly return on the FTSE All shares index, and D_t is a dummy variable that takes the value of one if $t \geq t_0$ and zero otherwise, where t_0 is the month of the repurchase announcement. Panel A. reports the unadjusted changes in risk characteristics. Panel B reports the adjusted changes in risk characteristics. For each firm that has announced its intention to repurchase its shares in the open market, I estimate the monthly regressions for the three years prior to the month of the announcement $(t_0\text{-}36)$ and for the three years after the month of the announcement $(t_0\text{+}36)$. SMB is the difference between the monthly return of a small firms portfolio from a portfolio of large firms. HML is the difference between the monthly return of a portfolio of high book-to-market firms from a portfolio of low book-to-market firms. For estimating SMB, FTSE 100 index is used as a proxy for large firms' portfolio and FTSE Small Cap index is used as a proxy for small firms' portfolio. For estimating HML, FTSE 350 Value index is used as a proxy for a high book to market firms' portfolio and FTSE 350 Growth index is used as a proxy for a low book to market firms' portfolio. $b{-}i$, $s{-}i$, and $h{-}i$ are the factor loadings (betas) of firm i during the three years prior to the share repurchase announcement. $b_\Delta i$, $s_\Delta i$, and $h_\Delta i$ are the changes in the factor loadings after the share repurchase announcement. $\alpha{-}i$ is the abnormal return of firm i before the share repurchase announcement, and $\alpha_\Delta i$ is the change in abnormal return after the announcement of the share repurchase programme. The adjusted regression coefficient is equal to the unadjusted coefficient minus the regression coefficient of each of the two control samples (industry-size and industry-mkbk matched) at the end of year −1, respectively. To reduce the effect of estimation errors and eliminate the possibility of negative values for the cost of capital, I exclude from the sample all observations in which the absolute value of the change in cost of capital is greater than the cost of capital before the share repurchase announcement. I also exclude from the sample all observations in which the cost of capital before the share repurchase announcement is negative. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively, for the reported mean (median) values based on a two tailed t-test (two-tailed Wilcoxon rank test).

Panel A. Unadjusted Changes in Risk

Market Model		Test Firms	Below Median	Above Median
			Magnitude of Dividends per share	
		Test Firms	*Below Median*	*Above Median*
$a_{\Delta i}$	Mean	-0.001	-0.003	0.001
	Median	-0.002	-0.011	0.003
$b_{\Delta i}$ (*Δ in market beta*)	Mean	-0.067	-0.205*	0.069
	Median	-0.017	-0.178*	0.067
	N	*191*	*92*	*99*
Three Factor Model				
$a_{\Delta i}$	Mean	0.003	0.005	0.002
	Median	0.000	-0.005	0.001
$b_{\Delta i}$ (*Δ in market beta*)	Mean	-0.022	-0.146	0.077
	Median	0.013	-0.220*	0.103
$s_{\Delta i}$ (*Δ in small firm beta*)	Mean	0.105*	0.202**	0.006
	Median	0.084	0.195**	0.052
$h_{\Delta i}$ (*Δ in B/M beta*)	Mean	-0.078	-0.066	-0.077
	Median	0.027	0.097	-0.076
	N	*191*	*92*	*99*

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Table 4.6 Continued.

<table>
<tr><td colspan="6" align="center">Panel B. Adjusted Changes in Risk</td></tr>
<tr><td></td><td></td><td></td><td colspan="3" align="center">Magnitude of
Dividends per share</td></tr>
<tr><td>Market Model</td><td></td><td></td><td>*MKBK Matched*</td><td>*Below Median*</td><td>*Above Median*</td></tr>
<tr><td>$a_{\Delta i}$</td><td>Mean</td><td></td><td>-0.004</td><td>-0.006</td><td>-0.003</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.010</td><td>-0.012</td><td>-0.011</td></tr>
<tr><td>$b_{\Delta i}$ (*Δ in market beta*)</td><td>Mean</td><td></td><td>-0.093</td><td>-0.243*</td><td>0.044</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.125</td><td>-0.225</td><td>-0.090</td></tr>
<tr><td></td><td>*N*</td><td></td><td>*182*</td><td>*91*</td><td>*91*</td></tr>
<tr><td>Three Factor Model</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>$a_{\Delta i}$</td><td>Mean</td><td></td><td>0.001</td><td>-0.001</td><td>0.003</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.006</td><td>-0.012</td><td>-0.006</td></tr>
<tr><td>$b_{\Delta i}$ (*Δ in market beta*)</td><td>Mean</td><td></td><td>-0.023</td><td>-0.210</td><td>0.151</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.062</td><td>-0.236</td><td>-0.050</td></tr>
<tr><td>$s_{\Delta i}$ (*Δ in small firm beta*)</td><td>Mean</td><td></td><td>0.263**</td><td>0.321**</td><td>0.213</td></tr>
<tr><td></td><td>Median</td><td></td><td>0.102*</td><td>0.182*</td><td>0.056</td></tr>
<tr><td>$h_{\Delta i}$ (*Δ in B/M beta*)</td><td>Mean</td><td></td><td>-0.051</td><td>0.317</td><td>-0.482</td></tr>
<tr><td></td><td>Median</td><td></td><td>0.102</td><td>0.183</td><td>-0.087</td></tr>
<tr><td></td><td>*N*</td><td></td><td>*182*</td><td>*91*</td><td>*91*</td></tr>
<tr><td></td><td></td><td></td><td colspan="3" align="center">Magnitude of
Dividends per share</td></tr>
<tr><td>Market Model</td><td></td><td></td><td>*Size Matched*</td><td>*Below Median*</td><td>*Above Median*</td></tr>
<tr><td>$a_{\Delta i}$</td><td>Mean</td><td></td><td>0.003</td><td>0.000</td><td>0.008</td></tr>
<tr><td></td><td>Median</td><td></td><td>0.000</td><td>-0.006</td><td>0.005</td></tr>
<tr><td>$b_{\Delta i}$ (*Δ in market beta*)</td><td>Mean</td><td></td><td>-0.137</td><td>-0.296*</td><td>0.126</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.130</td><td>-0.300**</td><td>0.081</td></tr>
<tr><td></td><td>N</td><td></td><td>117</td><td>73</td><td>44</td></tr>
<tr><td>Three Factor Model</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>$a_{\Delta i}$</td><td>Mean</td><td></td><td>0.000</td><td>-0.002</td><td>0.003</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.003</td><td>0.003</td><td>-0.004</td></tr>
<tr><td>$b_{\Delta i}$ (*Δ in market beta*)</td><td>Mean</td><td></td><td>-0.211</td><td>-0.374*</td><td>0.061</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.086</td><td>-0.292</td><td>-0.043</td></tr>
<tr><td>$s_{\Delta i}$ (*Δ in small firm beta*)</td><td>Mean</td><td></td><td>0.225*</td><td>0.266</td><td>0.159</td></tr>
<tr><td></td><td>Median</td><td></td><td>0.148</td><td>0.097</td><td>0.200</td></tr>
<tr><td>$h_{\Delta i}$ (*Δ in B/M beta*)</td><td>Mean</td><td></td><td>-0.096</td><td>-0.194</td><td>0.067</td></tr>
<tr><td></td><td>Median</td><td></td><td>-0.076</td><td>0.195</td><td>0.097</td></tr>
<tr><td></td><td>*N*</td><td></td><td>*117*</td><td>*73*</td><td>*44*</td></tr>
</table>

Moreover, I perform a more in-depth analysis on the impact that the actual share repurchases can have on the change of a firm's risk, apart from the announcement itself. I do this by estimating the firms' systematic risk (betas) for the year prior to the announcement of the open market share repurchase programme, during the implementation of the programme excluding the actual trades, the days when the actual repurchase trades took place, and finally, the year after the completion of the repurchase programme.

Since I do not have strong evidence that the announcement itself, of an open market share repurchase, conveys risk related information to the market, by analysing the risk changes during the different stages of the share repurchase implementation, I can see if the market follows up on the reporting of the actual repurchase trades and if it has a significant impact on a firm's market risk. The results reported in Table 4.7 suggest that there is no change in market risk between the period prior to the repurchase programme and the period during the implementation of the repurchase programme, since the difference in the mean betas is not statistically significant. It is notable however, that when estimating the betas only for the days when the actual repurchase trades took place, I find a significant decrease of market risk, since the mean (median) beta estimated for the period during the implementation (without the actual trades) are significantly higher than the mean (median) beta estimated for only the actual trades. In addition, I find that the beta for the actual trading days is significantly lower compared to the period during the repurchase implementation and the period after the completion of the repurchase programme. Hence, since I find evidence of a significant risk change between the period after the repurchase and the period prior or during the repurchase, I conclude that the actual repurchase trades and their respective reporting convey risk related information, which is followed up by the market.

Further, I find that non-repurchasing firms of the same industry, and of similar size, have consistently higher market risk and especially for the period during the actual trades, where the difference in mean (median) betas between the repurchasing and non-repurchasing firms is statistically significant. In contrast, the evidence suggests that non-repurchasing firms of the same industry and similar valuation (proxied by the market-to-book ratio) have consistently a lower and statistically significant risk compared to repurchasing firms. This finding, in combination with the fact that repurchasing firms have a significant decline in market risk during the days

Table 4.7 Risk changes surrounding the actual share repurchases.

This table reports the mean and median estimated systematic risk (β parameter of the market model) for the test sample as well as the control samples constructed with the industry-size and industry-mkbk matching methods. The test sample consists of 132 firms in the U.K. that have announced their intention to repurchase their shares. The industry-size and industry-mkbk control samples consist of 80 and 130 firms respectively. Panel A. reports the respective estimated mean (median) betas for the test sample of firms, for the four periods surrounding share repurchases and the difference in means (medians) between the test and control samples. Panels B, C, and D, report the mean and median values of systematic risk and the respective differences between each pair of time periods under study, for the sample and control firms respectively. The systematic risk is estimated using the daily stock returns and equally weighted market returns for the periods of -255 to -2 days (pre-period), the daily returns for the period starting after the announcement of the programme (during clean), excluding the actual repurchase trades and ending at the day of the last repurchase of the programme, the daily returns on the days where the actual repurchase trades took place (actual trades period) and for +2 to +255 days (post-period) relative to the day of the repurchase announcement. Only firms with a minimum of fifty daily returns in each of the pre-announcement and post-completion periods were included. Δβ is the difference between the beta (β) of each company for the year prior to the year subsequent the announcement. The p-values for the differences in means and medians are reported. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively based on the p-values.

Panel A.	Test sample		Control sample (Industry-Size)		Control sample (Industry-MKBK)		Δβ test and size-matched control samples means (medians)	Δβ test and mkbk-matched control samples means (medians)
	β mean, (median)	Δβ	β mean, (median)	Δβ	β mean, (median)	Δβ		
Pre - announcement	0.649	-	0.659	-	0.259	-	-0.011	0.390***
	(0.613)	-	(0.474)	-	(0.170)	-	(0.139)	(0.443)***
During clean	0.707	-0.058	0.685	-0.026	0.366	-0.107	0.021	0.341***
	(0.700)	-0.087	(0.526)	-0.052	(0.189)	-0.019	(0.174)	(0.511)***
Actual trades period	0.559	0.148**	0.815	-0.129	0.357	0.009	-0.256**	0.202***
	(0.521)	0.178***	(0.893)	-0.368	(0.284)	-0.095	(-0.372)***	(0.237)***
Post - completion	0.680	-0.121**	0.658	0.157	0.369	-0.012	0.022	0.31***
	(0.688)	-0.167**	(0.638)	0.255	(0.256)	0.028	(0.050)	(0.432)***
Anova F-test (p-value)	*0.058*		*0.719*		*0.378*			
Welch F-test (p-value)	*0.061*		*0.881*		*0.205*			
Med. χ^2	*0.208*		*0.224*		*0.523*			
Adj. Med. χ^2	*0.269*		*0.317*		*0.649*			

Panel B.		Test sample		
	β mean, (median)	Δ β means (median)		
Pre - announcement	0.649	-		
	(0.613)	-		
During clean	0.707	-0.058	-	
	(0.700)	(-0.087)	-	
Actual trades period	0.559	0.090*	0.148**	-
	(0.521)	(0.092)*	(0.178)***	-
Post - completion	0.680	-0.031	0.027	-0.121**
	(0.688)	(-0.075)	(0.011)	(-0.167)**

Table 4.7 Continued.

Panel C.   Control sample (Industry-Size)

	Beta mean, (median)	Δ β means (median)		
Pre - announcement	0.659	-		
	(0.474)	-		
During clean	0.685	-0.026	-	
	(0.526)	(-0.052)	-	
Actual trades period	0.815	-0.155	-0.129	-
	(0.893)	(-0.420)	(-0.368)	-
Post - completion	0.658	0.002	0.028	0.157
	(0.638)	(-0.165)	(-0.113)	(0.255)

Panel D.   Control sample (Industry-MKBK)

	Beta mean, (median)	Δ β means (median)		
Pre - announcement	0.259	-		
	(0.170)	-		
During clean	0.366	-0.107	-	
	(0.189)	(-0.019)	-	
Actual trades period	0.357	-0.098	0.009	-
	(0.284)	(-0.114)	(-0.095)	-
Post - completion	0.369	-0.110	-0.003	-0.012
	(0.256)	(-0.086)	(-0.067)	(0.028)

of the actual repurchase trades, supports the argument that the actual open market share repurchase trades are perceived to be good news due to the reduction in agency costs.

For robustness check, I analyse the repurchasing firms' total risk, measured by the total variance of the stock returns, to its two primary components: the systematic risk and the idiosyncratic (firm specific) risk. I do this in two stages. First, for the one-year period before and after the share repurchase announcement. Second, for the four distinct time periods surrounding share repurchases. In detail, these time periods are, the year prior to the repurchase announcement, the period during the repurchase programme, excluding the actual repurchase trades, the days where only the actual repurchase trades took place, and finally the period after the repurchase programme was completed. For robustness check, I replicate the estimations for both the industry-size and industry-mkbk control samples.

Table 4.8 Risk Decomposition surrounding share repurchase announcements.
This table reports the components of a firm's total risk and their respective shift in relative importance on the overall risk for 1997 to 2006. The test sample consists of 132 firms in the U.K. that have announced their intention to repurchase their shares. The industry-size and industry-mkbk control samples consist of 80 and 130 firms respectively. Panels A, B, and C, report the respective estimated means of the risk components for the test- and the two control firm samples. The risk components are derived based on the simple market model. $\sigma_{r_i}^2$ is a firm's variance of returns (total risk). $\beta_{m_i}^2 \sigma_{r_m}^2$ is the market component of total risk. $\sigma_{e_i}^2$ is a firm's idiosyncratic risk. All the variance terms have been multiplied by 10^4 for reporting purposes. The risk decomposition is estimated using the daily stock returns and equally weighted market returns for the periods of -255 to -2 days (pre-period) and for +2 to +255 days (post-period) relative to the day of the repurchase announcement. Only firms with a minimum of fifty daily returns in each of the pre-announcement and post-completion periods were included. The p-values for the differences in means are reported. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively based on the p-values.

Panel A.	Test Sample		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre	4.089	0.500	3.583
	(100%)	(12.37%)	(87.63%)
Post	3.948	0.600	3.388
	(100%)	(14.17%)	(85.83%)
Δ in means	0.141	-0.054	0.195
p-value	0.783	0.540	0.693

Panel B.	Control sample (Industry-Size)		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre	6.458	0.400	6.036
	(100%)	(6.54%)	(93.46%)
Post	6.994	0.500	6.464
	(100%)	(7.58%)	(92.42%)
Δ in means	-0.536	-0.108	-0.428
p-value	0.732	0.331	0.773

Panel C.	Control sample (Industry-MKBK)		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre	10.174	0.200	10.020
	(100%)	(1.51%)	(98.49%)
Post	9.423	0.200	9.204
	(100%)	(2.32%)	(97.68%)
Δ in means	0.750	-0.065	0.815
p-value	0.222	0.678	0.702

Table 4.8 reports the results on the effect that an open market share repurchase announcement can have on a firm's risk. The results show that there is no statistically significant change on the average total risk, or on the systematic and idiosyncratic risk. Hence, these results confirm the previous findings that the announcement itself does not convey risk related information to the market.

Panel A of Table 4.9 reports the results for the risk decomposition for the four time periods surrounding share repurchases. Panels B and C report the risk decomposition for the four time periods surrounding share repurchases for the two control samples. Panel D reports the respective differences in total risk between each time period of the estimation. The results show, that repurchasing firms' total risk during the days where the actual trades are taking place is significantly lower, compared to the total risk for the time period prior to the repurchase announcement as well as compared to the period after the completion of the repurchase programme. In addition, I find that the repurchasing firms' total risk for the period after the repurchase programme completion is significantly higher compared to the period prior to the announcement and the period during the repurchase programme implementation. I repeat the estimations for the two control samples, and I find no significant differences in average risk for any of the four time periods surrounding share repurchases.

In sum, I find that the open market share repurchase announcements do not convey information to the market that can affect a firm's risk. However, I find that the actual share repurchase trades and their respective reporting do provide risk related information to the market. Moreover, repurchasing firms experience a significant decline in total risk as well as in systematic and idiosyncratic risk during the days when the actual repurchase trades take place. In addition, I find evidence that repurchasing firms' risk increases significantly after the completion of the repurchase programme.

Table 4.9 Risk Decomposition surrounding the actual share repurchases

This table reports the components of a firm's total risk and their respective shift in relative importance on the overall risk for 1997 to 2006. The test sample consists of 132 firms in the U.K. that have announced their intention to repurchase their shares. The industry-size and industry-mkbk control samples consist of 80 and 130 firms respectively. Panel A. reports the respective estimated average risk components for the test sample of firms, for the four periods surrounding share repurchases and the difference in means between the test and control samples. Panels B, and C, report the average values of the total risk components. Panel D, reports the respective differences in means for each risk component, between each pair of time periods under study, for the sample firms and control firms respectively. The risk components are derived based on the simple market model. $\sigma_{r_i}^2$ is a firm's variance of returns (total risk). $\beta_{m_i}^2 \sigma_{r_m}^2$ is the market component of total risk. $\sigma_{e_i}^2$ is a firm's idiosyncratic risk. All the variance terms have been multiplied by 10^4 for reporting purposes. The risk decomposition is estimated using the daily stock returns and equally weighted market returns for the periods of -255 to -2 days (pre-announcement), the period starting after the announcement of the programme (during clean), excluding the actual repurchase trades and ending at the day of the last repurchase of the programme, the daily returns on the days where the actual repurchase trades took place (actual trades period) and for +2 to +255 days (post-completion) relative to the day of the repurchase announcement. Only firms with a minimum of fifty daily returns in each of the pre-announcement and post-completion periods were included. The p-values for the differences in means are reported. ***, **, and * indicate statistical significance at the 1, 5 and 10% level respectively based on the p-values.

Panel A.	Test Sample		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre - announcement	3.359	0.471	2.888
	(100%)	(14.02%)	(85.98%)
During clean	3.187	0.549	2.638
	(100%)	(17.23%)	(82.77%)
Actual trades period	3.017	0.743	2.274
	(100%)	(24.61%)	(75.39%)
Post – completion	4.587	0.787	3.800
	(100%)	(17.16%)	(82.84%)
Anova F-test	*0.001*	*0.074*	*0.003*

Panel B.	Control sample (Industry-Size)		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre - announcement	5.579	0.462	5.116
	(100%)	(8.28%)	(91.72%)
During clean	6.485	0.848	5.637
	(100%)	(13.08%)	(86.92%)
Actual trades period	10.810	1.534	9.276
	(100%)	(14.19%)	(85.81%)
Post – completion	6.536	0.693	5.843
	(100%)	(10.60%)	(89.40%)
Anova F-test	*0.124*	*0.000*	*0.247*

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Table 4.9 Continued.

Panel C.	Control sample (Industry-MKBK)		
	Estimated Variance $(\sigma_{r_i}^2)$	Systematic risk $(\beta_{m_i}^2 \sigma_{r_m}^2)$	Idiosyncratic Risk $(\sigma_{e_i}^2)$
Pre - announcement	8.020 (100%)	0.095 (1.19%)	7.924 (98.81%)
During clean	9.852 (100%)	0.808 (8.20%)	9.044 (91.80%)
Actual trades period	6.883 (100%)	0.153 (2.22%)	6.730 (97.78%)
Post – completion	7.713 (100%)	0.351 (4.55%)	7.362 (95.45%)
Anova F-test	*0.898*	*0.462*	*0.940*

Panel D.	Differences in Means of Total Risk $(\sigma_{r_i}^2)$								
	Test			Industry – Size			Industry – MKBK		
Pre - announcement	1			1			1		
During clean	0.172 (0.651)	1		-0.906 (0.523)	1		-1.832 (0.504)	1	
Actual trades period	0.342* (0.081)	0.170 (0.280)	1	-5.232 (0.199)	-11.717 (0.180)	1	1.137 (0.799)	-8.715 (0.610)	1
Post - completion	-1.228** (0.026)	-1.400** (0.020)	-1.570*** (0.002)	-0.957 (0.456)	-0.051 (0.970)	-18.253 (0.155)	0.306 (0.861)	2.138 (0.475)	-16.428 (0.867)

These results confirm that firm risk significantly declines during the days where the actual trades take place. This suggests that the actual share repurchase trades are followed up by the market and are perceived as being good news. Hence, witnessing a decline in firm risk (Berk et al., 1999). Moreover, I argue that the findings on the decline in risk during the actual repurchase trades, and not on the open market share repurchase announcement, is in line with Grullon and Michaely (2004), who argue that the market is already aware of the decline in future investment opportunities. Hence, the actual repurchases are perceived to be good news for the reduction of the agency costs. Therefore, I find that risk changes during the actual share repurchase trades, and not on the open market share repurchase announcement, which is not a

commitment to the firm. Finally, the increase of repurchasing firms' risk for the period after the completion of the repurchase programme, compared to the period during the repurchase programme, and especially compared to the period prior to the repurchase announcement, reflects the expected decline in future investment opportunities.

4.5. Summary and Conclusions

The goal of this chapter is to identify whether firms in the U.K. complete the announced open market share repurchase programmes and to what proportion, and the determinants that underlie the respective completion rates. In addition, this study aims to identify whether managers trade strategically (i.e. market timing or price support), and if there are any significant risk changes surrounding the entire cycle of open market share repurchases from the time of the announcement, to the programmes' initiation and completion. For achieving this goal I identify 197 announcements of intention to repurchase shares in the open market from corporations primarily listed in the United Kingdom, from 1st of January 1997 through 31st of December 2006.

I find that U.K. firms repurchase on average (median) 74% (54%) of the shares intended to repurchase at the time of the announcement, and it takes on average (median) 69 (21) days after the announcement for firms to initiate their repurchase programme. In addition, I find that 31% of the firms that have announced their intention to repurchase their shares, have not bought back any of their shares. Furthermore, I find that firms that increase their leverage, pay out dividends, and decrease their ownership concentration after the share repurchase announcement, and especially those firms that initiate the announced share repurchase programme as soon as possible after the announcement, have higher share repurchase completion rates. Concerning the managers' potential strategic trading, the evidence show that the managerial incentive for undertaking the actual repurchases is price support rather than market timing. In addition, the announcement of intention to repurchase shares does not have a significant effect on firm risk. Nevertheless, I find that the actual repurchase trades and their respective reporting do provide risk related information to the market. Moreover, repurchasing firms experience a significant decline in total risk, as well as in systematic and idiosyncratic risk, during the days when the actual

repurchase trades take place. Finally, I find evidence that repurchasing firms' risk increases significantly after the completion of the repurchase programme which reflects the expected decline in future investment opportunities.

The contribution of this chapter is the investigation of the U.K. firms' completion rates of open market share repurchases, and the identification of the firm specific characteristics that influence the respective completion rates. In addition, it contributes by investigating if managers repurchase strategically (i.e. market timing or price support hypotheses), as well as analysing if open market share repurchases convey information that can affect firm risk, an area that has not been vigorously investigated. Finally, this chapter contributes by analysing if the market follows up on the actual daily repurchase trades, which will be reflected on the respective risk changes, and by providing a broad and clear picture on overall firm risk. This is accomplished by performing a risk decomposition surrounding the entire process of open market share repurchases, from the announcement of the repurchase programme and its initiation, to the short term period after its completion.

Chapter 5.

5. Concluding Remarks

In recent years, share repurchases, and in particular open market share repurchases, have been gaining an increasing popularity as a payout method of excess cash to shareholders, apart from regular cash dividends. It is notable, that in the turn of the millennium, for the first time, the amount spent by corporations in the United States for repurchasing shares surpassed the respective amount spent on cash dividends. Even though this does not apply on the European markers, an increasing number of corporations in Continental Europe recently announced their intention to repurchase their shares in the open market. This is due to a number of regulatory restrictions in a number of European countries that rendered open market share repurchases either illegal or quite complicated to undertake. Due to the upcoming popularity of open market share repurchases, a number of theories have been developed by the literature in order to identify and establish why it is only recently that share repurchases are commonly employed and what are their effects, as well as the information content of such decisions. The most commonly accepted theories that have been developed in the literature to explain the decision to repurchase, are the agency costs of free-cash-flows, the signalling of undervaluation, capital restructuring, taxation, and dividend substitution hypotheses.

The motivation of this thesis are the conflicting results derived from the investigation of the aforementioned hypotheses, the lack of international, and especially European data, and particularly the fact that the literature so far has been investigating share repurchases through single-market analyses, without performing a cross-country analysis, which can provide a direct comparison of the findings in the literature, and evaluate them through different regulatory, cultural, and institutional settings. Therefore, I have investigated the effects to the market of the announcement of intention to repurchase shares in the open market, and the management's incentives for doing so, in a cross-country framework. In addition, I have analysed if managers in the United Kingdom time their decision to repurchase shares, and if they complete the intended repurchase programmes, as well as if the announcement and

the reporting of actual repurchase trades convey any information to the market that will impact the firms' risk.

For conducting this research, a comprehensive sample has been employed of 970 hand-collected news announcements of corporations' intention to repurchase their shares in the open market, of which 513 announcements took place in the United Kingdom, 263 in France and 194 in Germany. From the investigation of the managerial incentives for announcing an open market share repurchase program, it becomes evident that the same motives do not apply in every country. I find that in all three countries, firms that are large, and have low levels of ownership concentration are more likely to announce their intention to repurchase their shares in the open market. Further, I find only in the U.K. that firms' low growth with high excess cash levels can have a significant impact on the likelihood of announcing an open market share repurchase programme. In addition, I find some evidence in France and Germany, that a firm's potential undervaluation has a significant impact on the decision to announce a share repurchase. Finally, I find for all three countries that the dividend pay out has a positive relationship with the propensity to announce a share repurchase, hence supporting the hypothesis that share repurchases are viewed by managers as complements rather than substitutes to dividends.

I find a positive abnormal market reaction to the announcement of open market share repurchases, which varies significantly among the three countries and is significantly lower than the average market reaction reported in U.S. research studies. Furthermore, I find a significantly higher market reaction on the initial repurchase announcement, compared to subsequent repurchase announcements made by the same firm, suggesting that subsequent announcements convey less information to the market. In addition, I find in all three countries that size and past share price performance have a significant impact on the market reaction. Moreover, it is only in the United Kingdom that firm leverage and regulatory as well as tax changes have a significant impact on the market reaction to share repurchase announcements.

Finally, focusing on the actual open market share repurchase trades in the U.K., I find that approximately only 70% of the firms that have announced their intention to repurchase their shares have eventually initiated the repurchase programme. In addition, the evidence shows that on average firms repurchase approximately 74% of the shares targeted at the time of the announcement and for those firms that they do initiate the repurchase programme, it takes on average 69 days for them to do so.

Furthermore, I find that firms that increase their leverage, pay out dividends and decrease their ownership concentration after the share repurchase announcement, and especially those firms that initiate the announced repurchase programme the sooner after the announcement, are the ones who are more committed, and have higher completion rates. In addition, I find that the managerial incentive for carrying out the actual repurchase trades is to provide price support. Lastly, the evidence shows that it is the actual share repurchase trades, and their respective reporting, and not the repurchase announcements, that convey risk related information to the market.

The contribution of this thesis to the existing literature is as follows: I explore the existing gaps in the main contending hypotheses and investigate the impact of tax and regulatory changes on the market reaction to open market share repurchase announcements, as well as reflecting the level of homogeneity across the three main European markets. In addition, I provide an analysis of the signalling of undervaluation hypothesis. Moreover, this thesis contributes by examining and identifying what are the managerial incentives for publicly announcing an open market share repurchase. Furthermore, it contributes on the conflicting issue of share repurchases and the substitutability of dividends. This thesis also provides a thorough analysis of the actual repurchases trades and the completion rates of the announced repurchase programmes. What is more, this thesis delves into the question whether managers show timing ability for the actual share repurchase trades or do they repurchase for price support. In addition, it thoroughly examines the impact that the announcement, and even more so, the reporting of the actual share repurchase trades have on firms' risk. Finally, this thesis documents that in varying markets the managerial motives for an open market share repurchase and the market's reaction as well, diverge significantly.

It should be noted though, that this thesis has not focused on a number of other important issues that have not yet been thoroughly investigated in the existing literature. One of these issues is the long-term share price performance, operating performance and profitability of those firms that have announced their intention to repurchase their shares in the open market. This can be taken one step further, and investigate if their respective performance varies significantly between firms that have completed or were near to completion of their respective repurchase programmes, and those that have not repurchased at all, or only a small number of shares compared to the shares targeted at the time of the announcement.

Another important issue, is the mapping of the specific ownership structure of repurchasing firms, such as the proportion of shares owned by institutional investors and other block-holders, and the effect that this may have on the likelihood to announce an open market share repurchase programme, and their respective completion. This would be a very interesting issue to investigate, due to the potentially conflicting interests, tax strategies, and benefits that each shareholding group may have. In addition, the potential of any changes occurring on the ownership type and structure prior to the firms' announcement of intention to repurchase their shares could potentially have a significant impact on the market reaction due to the potential shift of the firms' existing agency costs.

Moreover, it is has not been clearly established if analysts revise their estimates after the announcement of a share repurchase, or if it is that firms make an open market share repurchase announcement, and actually repurchase their shares in order to meet the analysts' recommendations. Furthermore, the investigation of the potential effects that the actual share repurchase trades may have on firms' liquidity, which is a very interesting and relatively unexplored issue, falls outside the scope of this thesis. In addition, this thesis does not investigate the hostile take-over deterrence hypothesis nor the options funding hypothesis. However, firms that repurchase their shares in order to fend off a hostile takeover they are more likely to do this via fixed-price tender offer or Dutch auctions share repurchases, which allows them to repurchase a large number of their shares in a short period of time at a pre-specified price range, thus making it a more efficient takeover deterrent mechanism contrary to open market share repurchases as previously argued in this thesis. Regarding the options funding hypothesis, the reason that it is not investigated in this thesis is that it has a greater impact on the actual share repurchase trades rather than on the announcement of intention to repurchase shares in the open market. Nevertheless, it could weigh on the decision to make an open market share repurchase announcement and therefore one should keep this in mind when interpreting the findings of this research.

An additional limitation of this research is the fact that it does not consider any macroeconomic factors such as business cycles and market trends, which could add more explanatory power on the investigation of the motives for announcing the intention to repurchase shares in the open market but also for the execution of the actual share repurchase trades. However, the time period employed in this research is

not sufficient enough to allow the investigation of the impact of any cyclical macroeconomic effects since open market share repurchases in two of the three countries analysed in this research (i.e., France and Germany) were not allowed prior to 1997, thus restricting the time span of this research.

When analysing the market reaction to the announcement of intention to repurchase shares in the open market, this research does not focus on the announcement specific information that each announcement carries, i.e. the amount or proportion of common shares to be repurchased at the time of the announcement. The reason for this is twofold. First, in Germany and France the overwhelming majority of the sample firms routinely announce the maximum proportion of shares allowed to be repurchased, therefore by including the announcement specific information it would not provide any meaningful results. Second, in the United Kingdom, a considerable portion of the sample firms announce only their intention to repurchase their shares in the open market without providing any details regarding the targeted amount of shares to be repurchased, which would considerably reduce the overall sample firms to be tested. Moreover, even though the majority of the announcements sampling is based on individual stand-alone announcements, it also includes announcements of intention to repurchase shares in the open market following firms' annual or extraordinary general shareholder meetings (AGM/EGM) which could carry other types of information that could potential affect the market reaction on the day of the announcement. However, it should be clarified that the sample of announcements does not include any financial announcements, financial results, financial estimates etc., which would contaminate the findings on the market reaction to open market share repurchases and their respective interpretation. However, I acknowledge the fact that by not investigating the impact of the announcement specific information on the market reaction to open market share repurchase announcements, the findings and interpretation of this research should be treated with caution.

Furthermore, this research focuses only on open market share repurchases without accounting for fixed-price tender offers or Dutch auction repurchases. This is due to the fact that the open market share repurchases have gained an increasing popularity in the U.S. and the U.K. as a payout method since the late 1980s, whereas it was in the late 1990s that share repurchase became popular in Continental Europe due to regulatory restrictions. Furthermore, open market share repurchases have

become popular due to the different characteristics between open market share and fixed price repurchases, as well as due to the greater flexibility, lack of commitment and virtually no cost bearing that the open market share repurchase mechanism offers. Thus, open market share repurchases have become a significant corporate event and payout method that deserves to be studied individually in its own right. Consequently, one of the drivers of this research is to have a comprehensive analysis of the market reaction as well as managerial incentives for open market share repurchases, since this method has different effects on the market as well as on managers' motives compared to tender offers and Dutch auctions.

When investigating the actual open market share repurchase trades and specifically the market timing versus the price support hypothesis in the United Kingdom, it must be noted that there exist a regulatory constrain that restricts firms from repurchasing their shares at a price that is higher than the five percent of the firm's market price for the five business days prior to the repurchase trade. Therefore, this could potentially have impact the managers' flexibility on timing their trades in order to provide price support or to exploit a potential market mispricing with a subsequent price increase. However, this should not have any significant impact in the case where managers would strive to time their trades and repurchase the shares at lower prices and therefore providing evidence in favour of the market timing hypothesis. Nevertheless, even though there is a regulatory constrain on the price paid for the repurchased shares, the evidence shows that managers do pay a relatively higher price in order to provide price support. When analysing the impact of the regulatory change that allowed firms to keep the repurchased shares as Treasury stock on the market reaction to open share repurchase announcements, it must be noted that even after the regulatory change, firms routinely kept cancelling at least a proportion of the repurchased shares. Therefore, even though Treasury stock is a flexible capital management tool that firms can make use of, the findings on the market reaction should be treated with caution.

Finally, the fact that firms that have announced their intention to repurchase their shares in the open market and have actually implemented the announced repurchase programmes have low systematic risk (low betas), is an issue that can be further investigated in order to identify what are the characteristics of the those firms that drive the low betas. This can be investigated even further by assessing whether

the low systematic risk is the cause or the driver for the actual repurchase trades or it is the outcome of their share repurchase intention and/or actual repurchase trades.

In sum, it is acknowledged that this thesis has certain limitations and caveats which must be taken into consideration when interpreting the findings and results presented in this research. Furthermore, these limitations can constitute a fertile ground for further research that could strengthen the findings and outcomes of this thesis, as well as add to our knowledge regarding open market share repurchases and in general the payout policies that firms choose to employ.

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7. Appendix

Appendix A. Correlation analysis for the industry-matched samples
This table reports the correlation matrices for each variable employed in the logit models for the industry matching method for the United Kingdom, Germany and France respectively. The p-values indicating statistically significant correlation for each pair of variables are reported in parentheses.

Industry-Matched (United Kingdom)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	MKBK	D TAX	DIV_Y	DIV/NI
REP DUMMY	1										

CF	0.143	1									
	(0.002)	-----									
DFCF	0.172	0.008	1								
	(0.000)	(0.866)	-----								
LVG	0.068	-0.019	-0.028	1							
	(0.139)	(0.671)	(0.544)	-----							
OWN_CON	-0.300	-0.117	-0.087	0.004	1						
	(0.000)	(0.010)	(0.057)	(0.922)	-----						
SIZE (ASSETS)	0.459	0.238	0.126	0.261	-0.545	1					
	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)	-----					
RET 1YR	-0.013	0.011	0.021	-0.011	-0.066	0.041	1				
	(0.775)	(0.811)	(0.649)	(0.813)	(0.148)	(0.368)	-----				
MKBK	-0.044	0.025	-0.005	-0.028	0.028	-0.045	-0.031	1			
	(0.335)	(0.585)	(0.909)	(0.533)	(0.535)	(0.322)	(0.497)	-----			
D TAX	-0.034	-0.039	-0.026	-0.007	0.057	-0.129	0.019	-0.092	1		
	(0.461)	(0.393)	(0.570)	(0.885)	(0.211)	(0.005)	(0.671)	(0.044)	-----		
DIV_Y	0.112	0.231	0.005	0.021	-0.182	0.162	-0.009	-0.096	0.028	1	
	(0.014)	(0.000)	(0.919)	(0.649)	(0.000)	(0.000)	(0.843)	(0.035)	(0.533)	-----	
DIV/NI	-0.034	-0.024	0.016	-0.009	0.025	0.001	0.039	-0.045	0.033	0.001	1
	(0.455)	(0.605)	(0.725)	(0.836)	(0.578)	(0.974)	(0.390)	(0.327)	(0.468)	(0.987)	-----

Appendix A. Continued

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	MKBK	D TAX	DIV_ Y	DIV/NI
REP DUMMY	1										

CF	0.050	1									
	(0.486)	-----									
DFCF	-0.002	-0.028	1								
	(0.981)	(0.696)	-----								
LVG	-0.115	-0.050	0.277	1							
	(0.112)	(0.487)	(0.000)	-----							
OWN_CON	-0.317	-0.056	-0.065	-0.051	1						
	(0.000)	(0.443)	(0.372)	(0.478)	-----						
SIZE (ASSETS)	0.255	0.056	0.351	0.276	-0.226	1					
	(0.000)	(0.439)	(0.000)	(0.000)	(0.002)	-----					
RET 1YR	-0.046	0.031	0.084	-0.019	0.094	0.139	1				
	(0.529)	(0.664)	(0.246)	(0.794)	(0.195)	(0.053)	-----				
MKBK	0.005	-0.073	-0.319	-0.071	-0.009	-0.078	-0.146	1			
	(0.950)	(0.315)	(0.000)	(0.325)	(0.897)	(0.278)	(0.043)	-----			
D TAX	0.039	-0.009	0.143	0.027	0.085	0.273	0.069	-0.069	1		
	(0.586)	(0.904)	(0.047)	(0.706)	(0.242)	(0.000)	(0.342)	(0.339)	-----		
DIV_ Y	-0.018	0.012	0.051	-0.045	0.209	0.126	0.024	0.039	0.158	1	
	(0.804)	(0.866)	(0.479)	(0.532)	(0.004)	(0.082)	(0.736)	(0.588)	(0.028)	-----	
DIV/NI	0.106	0.009	0.056	0.028	-0.121	0.242	0.009	0.020	0.117	0.056	1
	(0.141)	(0.899)	(0.435)	(0.697)	(0.094)	(0.001)	(0.903)	(0.782)	(0.106)	(0.441)	-----

Appendix A. Continued

Industry-Matched (France)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	MKBK	D TAX	DIV_ Y	DIV/NI
REP DUMMY	1										

CF	0.147	1									
	(0.030)	-----									
DFCF	0.197	-0.034	1								
	(0.004)	(0.614)	-----								
LVG	0.006	-0.145	-0.018	1							
	(0.926)	(0.032)	(0.794)	-----							
OWN_CON	-0.377	0.140	-0.040	-0.115	1						
	(0.000)	(0.039)	(0.562)	(0.090)	-----						
SIZE (ASSETS)	0.477	0.018	0.246	0.226	-0.437	1					
	(0.000)	(0.790)	(0.000)	(0.001)	(0.000)	-----					
RET 1YR	0.058	-0.007	-0.034	0.102	-0.125	0.077	1				
	(0.393)	(0.914)	(0.614)	(0.133)	(0.066)	(0.260)	-----				
MKBK	0.118	0.276	-0.257	-0.061	0.002	-0.063	-0.045	1			
	(0.083)	(0.000)	(0.000)	(0.368)	(0.980)	(0.357)	(0.513)	-----			
D TAX	0.052	-0.089	-0.023	0.099	-0.061	0.117	-0.035	0.003	1		
	(0.442)	(0.191)	(0.738)	(0.147)	(0.371)	(0.086)	(0.609)	(0.960)	-----		
DIV_ Y	-0.016	0.011	0.032	-0.075	-0.037	0.065	0.098	-0.082	0.029	1	
	(0.816)	(0.874)	(0.638)	(0.268)	(0.590)	(0.342)	(0.149)	(0.229)	(0.672)	-----	
DIV/NI	0.152	-0.012	-0.008	0.008	-0.153	0.251	0.001	0.037	-0.017	0.041	1
	(0.025)	(0.858)	(0.904)	(0.901)	(0.024)	(0.000)	(0.983)	(0.591)	(0.808)	(0.545)	-----

Appendix B. Correlation analysis for the market-to-book-matched samples

This table reports the correlation matrices for each variable employed in the logit models for the market-to-book matching method for the United Kingdom, Germany and France respectively. The p-values indicating statistically significant correlation for each pair of variables are reported in parentheses.

| | Market-to-book-Matched (United Kingdom) | | | | | | | | | |
	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	0.175	1								
	(0.000)	-----								
DFCF	0.042	-0.006	1							
	(0.350)	(0.891)	-----							
LVG	0.082	-0.002	0.031	1						
	(0.065)	(0.964)	(0.486)	-----						
OWN_CON	-0.325	-0.137	-0.050	-0.189	1					
	(0.000)	(0.002)	(0.262)	(0.000)	-----					
SIZE (ASSETS)	0.478	0.232	0.186	0.320	-0.529	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	-----				
RET 1YR	-0.004	-0.010	-0.029	0.019	-0.029	-0.020	1			
	(0.933)	(0.822)	(0.520)	(0.674)	(0.510)	(0.658)	-----			
D TAX	-0.060	-0.103	0.041	-0.030	0.023	-0.070	0.009	1		
	(0.175)	(0.020)	(0.359)	(0.494)	(0.608)	(0.115)	(0.835)	-----		
DIV_Y	-0.038	0.148	0.113	-0.040	-0.073	0.015	-0.044	0.159	1	
	(0.397)	(0.001)	(0.011)	(0.371)	(0.101)	(0.729)	(0.317)	(0.000)	-----	
DIV/NI	0.035	0.009	0.056	0.039	-0.033	0.064	0.006	-0.058	0.027	1
	(0.434)	(0.844)	(0.210)	(0.382)	(0.451)	(0.148)	(0.885)	(0.194)	(0.548)	----

Appendix B. Continued

Market-to-book-Matched (Germany)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	0.085	1								
	(0.232)	-----								
DFCF	-0.073	-0.039	1							
	(0.305)	(0.586)	-----							
LVG	-0.171	-0.138	0.123	1						
	(0.015)	(0.051)	(0.083)	-----						
OWN_CON	-0.442	-0.084	0.003	-0.075	1					
	(0.000)	(0.235)	(0.964)	(0.293)	-----					
SIZE (ASSETS)	0.267	0.030	0.248	0.132	-0.333	1				
	(0.000)	(0.672)	(0.000)	(0.062)	(0.000)	-----				
RET 1YR	-0.196	-0.120	-0.018	0.152	0.097	-0.063	1			
	(0.005)	(0.091)	(0.799)	(0.031)	(0.171)	(0.374)	-----			
D TAX	-0.047	0.070	0.072	-0.051	0.069	0.142	0.079	1		
	(0.510)	(0.323)	(0.307)	(0.471)	(0.334)	(0.045)	(0.265)	-----		
DIV_Y	-0.238	0.002	0.147	0.121	0.153	0.078	0.069	-0.006	1	
	(0.001)	(0.974)	(0.038)	(0.088)	(0.030)	(0.271)	(0.330)	(0.929)	-----	
DIV/NI	0.055	0.114	0.027	-0.134	0.020	-0.039	-0.103	0.009	0.152	1
	(0.439)	(0.108)	(0.707)	(0.057)	(0.777)	(0.585)	(0.145)	(0.899)	(0.032)	-----

Appendix B. Continued

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	RET 1YR	D TAX	DIV_ Y	DIV/NI
REP DUMMY	1									

CF	0.060	1								
	(0.324)	-----								
DFCF	0.057	-0.092	1							
	(0.352)	(0.131)	-----							
LVG	0.142	-0.152	0.094	1						
	(0.020)	(0.012)	(0.122)	-----						
OWN_CON	-0.342	0.068	-0.028	-0.174	1					
	(0.000)	(0.262)	(0.644)	(0.004)	-----					
SIZE (ASSETS)	0.391	-0.011	0.313	0.315	-0.432	1				
	(0.000)	(0.858)	(0.000)	(0.000)	(0.000)	-----				
RET 1YR	0.021	-0.159	0.143	0.097	0.101	0.003	1			
	(0.733)	(0.009)	(0.019)	(0.111)	(0.097)	(0.956)	-----			
D TAX	0.018	0.087	-0.034	0.039	-0.115	0.112	-0.019	1		
	(0.764)	(0.155)	(0.575)	(0.526)	(0.059)	(0.065)	(0.754)	-----		
DIV_ Y	0.006	0.004	0.144	0.008	0.084	0.064	0.045	-0.161	1	
	(0.917)	(0.946)	(0.018)	(0.893)	(0.170)	(0.293)	(0.458)	(0.008)	-----	
DIV/NI	0.164	0.045	0.056	0.034	-0.095	0.138	0.037	0.055	-0.035	1
	(0.007)	(0.464)	(0.362)	(0.581)	(0.119)	(0.023)	(0.543)	(0.368)	(0.565)	-----

Market-to-book-Matched (France)

Appendix C. Correlation analysis for the size-matched samples

This table reports the correlation matrices for each variable employed in the logit models for the size matching method for the United Kingdom, Germany and France respectively. The p-values indicating statistically significant correlation for each pair of variables are reported in parentheses.

Size-Matched (United Kingdom)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	RET 1YR	MKBK	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	0.052	1								
	(0.243)	-----								
DFCF	0.032	-0.046	1							
	(0.474)	(0.297)	-----							
LVG	-0.024	0.020	0.074	1						
	(0.584)	(0.653)	(0.097)	-----						
OWN_CON	-0.106	-0.058	-0.099	-0.116	1					
	(0.016)	(0.187)	(0.025)	(0.009)	-----					
RET 1YR	-0.040	-0.106	0.069	0.034	-0.037	1				
	(0.365)	(0.016)	(0.118)	(0.441)	(0.406)	-----				
MKBK	0.013	-0.067	-0.015	0.068	-0.020	-0.065	1			
	(0.776)	(0.132)	(0.732)	(0.127)	(0.654)	(0.144)	-----			
D TAX	-0.027	-0.084	0.020	0.012	-0.083	0.092	0.022	1		
	(0.541)	(0.057)	(0.653)	(0.792)	(0.061)	(0.037)	(0.617)	-----		
DIV_Y	0.048	0.181	0.250	0.024	-0.137	-0.043	-0.049	0.122	1	
	(0.281)	(0.000)	(0.000)	(0.591)	(0.002)	(0.336)	(0.269)	(0.006)	-----	
DIV/NI	0.034	0.043	-0.005	0.013	-0.081	-0.007	0.004	-0.058	0.020	1
	(0.445)	(0.332)	(0.902)	(0.767)	(0.068)	(0.873)	(0.934)	(0.192)	(0.644)	-----

Appendix C. Continued

	Size-Matched (Germany)									
	REP DUMMY	CF	DFCF	LVG	OWN_CON	RET 1YR	MKBK	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	-0.010	1								
	(0.887)	-----								
DFCF	0.039	-0.017	1							
	(0.571)	(0.801)	-----							
LVG	-0.095	-0.134	0.116	1						
	(0.169)	(0.052)	(0.092)	-----						
OWN_CON	-0.498	-0.051	-0.098	-0.092	1					
	(0.000)	(0.464)	(0.158)	(0.183)	-----					
RET 1YR	-0.094	-0.161	0.066	0.006	0.097	1				
	(0.173)	(0.020)	(0.338)	(0.927)	(0.162)	-----				
MKBK	0.135	0.152	-0.249	-0.111	-0.067	0.014	1			
	(0.051)	(0.027)	(0.000)	(0.109)	(0.334)	(0.836)	-----			
D TAX	-0.026	0.022	0.183	-0.006	-0.012	0.086	0.016	1		
	(0.710)	(0.752)	(0.008)	(0.928)	(0.859)	(0.216)	(0.816)	-----		
DIV_Y	-0.200	0.210	0.242	-0.016	0.152	0.063	-0.154	0.070	1	
	(0.004)	(0.002)	(0.000)	(0.821)	(0.027)	(0.365)	(0.026)	(0.309)	-----	
DIV/NI	-0.123	0.053	0.078	0.077	0.145	-0.041	-0.001	-0.050	0.230	1
	(0.074)	(0.445)	(0.261)	(0.265)	(0.036)	(0.559)	(0.990)	(0.475)	(0.001)	-----

Appendix C. Continued

	REP DUMMY	CF	DFCF	LVG	OWN_CON	RET 1YR	MKBK	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	-0.038	1								
	(0.558)	-----								
DFCF	-0.003	-0.116	1							
	(0.957)	(0.072)	-----							
LVG	0.004	-0.205	0.094	1						
	(0.953)	(0.001)	(0.148)	-----						
OWN_CON	-0.321	0.010	0.109	-0.132	1					
	(0.000)	(0.876)	(0.092)	(0.042)	-----					
RET 1YR	-0.019	-0.122	0.155	0.079	0.115	1				
	(0.768)	(0.059)	(0.016)	(0.224)	(0.075)	-----				
MKBK	0.040	0.036	-0.271	-0.047	-0.082	-0.188	1			
	(0.538)	(0.575)	(0.000)	(0.470)	(0.206)	(0.003)	-----			
D TAX	-0.013	0.041	-0.057	0.041	-0.036	-0.061	-0.058	1		
	(0.842)	(0.532)	(0.377)	(0.526)	(0.579)	(0.344)	(0.375)	-----		
DIV_Y	-0.058	0.224	0.063	-0.080	0.013	0.073	-0.225	0.042	1	
	(0.368)	(0.001)	(0.331)	(0.219)	(0.841)	(0.258)	(0.000)	(0.515)	-----	
DIV/NI	0.021	0.011	0.045	0.069	0.032	0.076	-0.071	-0.033	0.093	1
	(0.746)	(0.870)	(0.490)	(0.289)	(0.622)	(0.238)	(0.272)	(0.616)	(0.150)	-----

Appendix D. Correlation analysis for the non-matched samples

This table reports the correlation matrices for each variable employed in the logit models for the non-matched samples for the United Kingdom, Germany and France respectively. The p-values indicating statistically significant correlation for each pair of variables are reported in parentheses.

Non-Matched (United Kingdom)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	MKBK	D TAX	DIV_ Y	DIV/NI
REP DUMMY	1									

CF	0.008	1								
	(0.411)	-----								
DFCF	0.059	0.023	1							
	(0.000)	(0.019)	-----							
LVG	-0.002	-0.441	-0.014	1						
	(0.799)	(0.000)	(0.146)	-----						
OWN_CON	-0.125	-0.007	-0.127	0.005	1					
	(0.000)	(0.461)	(0.000)	(0.633)	-----					
SIZE (ASSETS)	0.270	0.109	0.338	-0.104	-0.382	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	-----				
MKBK	-0.003	0.007	-0.013	-0.010	0.017	-0.031	1			
	(0.755)	(0.444)	(0.193)	(0.318)	(0.077)	(0.002)	-----			
D TAX	0.015	-0.023	0.023	0.006	0.033	-0.029	-0.010	1		
	(0.123)	(0.018)	(0.017)	(0.504)	(0.001)	(0.003)	(0.297)	-----		
DIV_ Y	0.033	0.031	0.145	-0.023	-0.102	0.267	-0.015	-0.007	1	
	(0.001)	(0.001)	(0.000)	(0.020)	(0.000)	(0.000)	(0.114)	(0.471)	-----	
DIV/NI	0.016	0.002	0.016	-0.002	-0.018	0.012	-0.002	-0.004	0.039	1
	(0.108)	(0.834)	(0.089)	(0.807)	(0.060)	(0.202)	(0.876)	(0.685)	(0.000)	-----

Appendix D. Continued

Non-Matched (Germany)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	MKBK	D TAX	DIV_ Y	DIV/NI
REP DUMMY	1									

CF	-0.033	1								
	(0.159)	-----								
DFCF	0.053	0.005	1							
	(0.023)	(0.818)	-----							
LVG	-0.026	0.618	-0.021	1						
	(0.270)	(0.000)	(0.355)	-----						
OWN_CON	-0.172	0.046	-0.166	-0.019	1					
	(0.000)	(0.049)	(0.000)	(0.416)	-----					
SIZE (ASSETS)	0.273	-0.296	0.292	-0.216	-0.189	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	-----				
MKBK	-0.006	-0.003	-0.028	0.012	0.038	-0.058	1			
	(0.786)	(0.888)	(0.227)	(0.591)	(0.101)	(0.012)	-----			
D TAX	0.066	0.000	-0.036	0.010	-0.084	0.037	-0.039	1		
	(0.004)	(0.997)	(0.116)	(0.655)	(0.000)	(0.109)	(0.096)	-----		
DIV_ Y	-0.023	-0.020	0.003	-0.014	0.017	0.031	-0.023	0.038	1	
	(0.325)	(0.381)	(0.904)	(0.541)	(0.453)	(0.176)	(0.314)	(0.102)	-----	
DIV/NI	-0.006	0.008	-0.036	-0.003	0.034	-0.047	-0.004	0.024	-0.125	1
	(0.783)	(0.725)	(0.119)	(0.890)	(0.139)	(0.041)	(0.870)	(0.290)	(0.000)	-----

Appendix D. Continued

Non-Matched (France)

	REP DUMMY	CF	DFCF	LVG	OWN_CON	SIZE (ASSETS)	MKBK	D TAX	DIV_Y	DIV/NI
REP DUMMY	1									

CF	-0.018	1								
	(0.446)	-----								
DFCF	0.079	0.002	1							
	(0.001)	(0.921)	-----							
LVG	-0.017	0.827	0.026	1						
	(0.447)	(0.000)	(0.265)	-----						
OWN_CON	-0.227	0.020	0.008	0.017	1					
	(0.000)	(0.379)	(0.722)	(0.461)	-----					
SIZE (ASSETS)	0.290	-0.227	0.242	-0.226	-0.207	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	-----				
MKBK	0.007	0.002	0.003	0.000	0.027	0.002	1			
	(0.745)	(0.940)	(0.897)	(0.986)	(0.234)	(0.941)	-----			
D TAX	0.071	-0.009	0.003	-0.005	0.001	0.061	-0.002	1		
	(0.002)	(0.704)	(0.898)	(0.844)	(0.969)	(0.008)	(0.924)	-----		
DIV_Y	-0.018	0.033	0.055	0.045	0.040	-0.043	0.001	-0.044	1	
	(0.436)	(0.151)	(0.017)	(0.049)	(0.085)	(0.060)	(0.950)	(0.056)	-----	
DIV/NI	0.015	0.024	0.020	0.041	0.015	-0.023	0.009	-0.029	0.035	1
	(0.515)	(0.291)	(0.387)	(0.078)	(0.503)	(0.307)	(0.686)	(0.205)	(0.129)	-----

Appendix E. Correlation analysis for the determinants of open market share repurchase completion rates

This table reports the correlation matrices for each variable employed in the cross-section analysis for determining the impact of firm specific characteristics on the completion rates of the announced open market share repurchase programmes in the United Kingdom. The p-values indicating statistically significant correlation for each pair of variables are reported in parentheses.

	CR	SIZE	MKBK	REP	LVG	ΔLVG	DIV_Y	ΔDIV	DIV/NI	CF EXP	CF UN	ER	ΔER	OWN CON (%)	ΔOWN CON	DAY _DIF
CR	1															

SIZE	0.275	1														
	(0.006)	-----														
MKBK	0.148	0.106	1													
	(0.148)	(0.302)	-----													
REP	0.144	0.379	0.224	1												
	(0.160)	(0.000)	(0.027)	-----												
LVG	0.292	0.155	0.101	-0.051	1											
	(0.004)	(0.129)	(0.325)	(0.617)	-----											
ΔLVG	0.017	0.007	0.046	-0.030	-0.269	1										
	(0.870)	(0.946)	(0.653)	(0.772)	(0.008)	-----										
DIV_Y	0.304	-0.023	-0.206	-0.022	0.051	-0.148	1									
	(0.003)	(0.822)	(0.043)	(0.830)	(0.620)	(0.148)	-----									
ΔDIV	-0.069	0.007	0.164	0.184	0.025	-0.059	-0.216	1								
	(0.504)	(0.943)	(0.108)	(0.071)	(0.811)	(0.565)	(0.034)	-----								
DIV/NI	0.083	0.069	-0.037	0.128	0.037	-0.032	0.026	-0.030	1							
	(0.417)	(0.503)	(0.722)	(0.212)	(0.719)	(0.757)	(0.799)	(0.774)	-----							
CF EXP	-0.030	-0.066	0.358	0.145	-0.132	0.118	-0.152	-0.035	-0.030	1						
	(0.773)	(0.521)	(0.000)	(0.156)	(0.196)	(0.252)	(0.136)	(0.732)	(0.767)	-----						

CF UN	-0.076	0.079	-0.147	-0.137	-0.050	-0.035	-0.266	0.107	-0.021	-0.036	1					
	(0.458)	(0.443)	(0.151)	(0.180)	(0.629)	(0.736)	(0.008)	(0.297)	(0.835)	(0.725)	-----					
ER	-0.123	-0.197	-0.145	-0.023	-0.104	-0.081	0.132	-0.055	-0.055	0.087	0.234	1				
	(0.232)	(0.053)	(0.157)	(0.822)	(0.312)	(0.432)	(0.197)	(0.593)	(0.595)	(0.395)	(0.021)	-----				
ΔER	-0.008	0.023	-0.004	0.030	-0.017	-0.070	-0.006	-0.006	-0.031	-0.166	0.170	0.012	1			
	(0.940)	(0.819)	(0.970)	(0.767)	(0.868)	(0.498)	(0.957)	(0.954)	(0.767)	(0.104)	(0.095)	(0.910)	-----			
OWN CON (%)	-0.052	-0.354	-0.102	-0.171	0.015	-0.060	-0.085	0.015	0.006	-0.037	0.071	0.104	-0.105	1		
	(0.613)	(0.000)	(0.319)	(0.095)	(0.888)	(0.558)	(0.407)	(0.883)	(0.955)	(0.716)	(0.491)	(0.310)	(0.305)	-----		
ΔOWN CON	-0.107	-0.010	0.006	0.034	-0.010	-0.121	0.115	-0.061	-0.009	-0.255	-0.003	0.026	0.342	-0.179	1	
	(0.297)	(0.925)	(0.957)	(0.740)	(0.926)	(0.238)	(0.262)	(0.553)	(0.933)	(0.012)	(0.973)	(0.799)	(0.001)	(0.080)	-----	
DAY_DIF	-0.216	0.025	-0.125	-0.131	0.112	-0.062	-0.009	0.003	0.002	-0.139	0.045	0.036	0.082	-0.036	0.033	1
	(0.034)	(0.805)	(0.221)	(0.200)	(0.273)	(0.546)	(0.928)	(0.978)	(0.981)	(0.174)	(0.662)	(0.729)	(0.423)	(0.726)	(0.749)	-----

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