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The Market Valuation of Share Repurchases in Europe

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Abstract

We analyze a uniquely constructed data set of open market share repurchases across a sample of European firms. We find that the announcement date market reaction is lower than that in the US, mainly because of (i) the relatively large number of recurring announcements which generate significantly lower returns than the initial announcements of intention to repurchase shares; (ii) the rather low market reaction in France, due probably to specific governance and corporate cultural issues; and (iii) the regulatory reform that allowed UK firms to keep the repurchased shares as treasury stock, which decreased their market impact. Across our countries, taxation, shareholder protection, and the European Union's Market Abuse Directive do not affect significantly the market valuation of repurchases. Our results imply that, ultimately, domestic institutional specificities and reforms play significant roles in the market valuation and popularity of share repurchases.

Key words: Share repurchases; Recurring announcements; Investor protection;

Taxation; Signaling undervaluation; Market Abuse Directive (MAD);

Regulatory treatment of share repurchases.

1. Introduction

Previous studies document a positive stock price reaction to the announcement of intention to repurchase shares. This reaction is related to various hypotheses, including the signaling of undervaluation, agency theory, capital restructuring, dividend substitution, management compensation incentives and firms' reputation. However, the empirical evidence provided to date on the impact of each of these factors is mixed, and although the information asymmetry/signaling hypothesis has long been viewed as a popular explanation, it does not necessarily hold in the context of open market and privately negotiated repurchases (Huang and Thakor, 2013). This is partly because most studies focus on a single country, where share repurchases have the same treatment, even though some regulatory changes may occur through time. (See Section 2 below, Vermaelen (2005), and Farre-Mensa et al. (2014) for reviews of the literature).

In this paper we focus on the market valuation of share repurchases and its determinants across major European countries. We construct a unique hand-collected dataset of 970 announcements of intention to repurchase shares in the open market in France, Germany and the UK. We assess the effects of diversity across our countries in terms of regulatory and corporate governance settings (La Porta et al., 2000, 2002; Morck et al., 2005), the respective domestic reforms within each country, and the impact of recurring announcements on the market valuation of share repurchases.

In line with previous evidence, we find a positive market reaction of 1.55%. These excess returns are relatively lower than the 3.54% reported in the US by, for example, Ikenberry et al. (1995). We first test whether this is due to differences in corporate governance across our countries. We expect the announcement date excess returns in the UK to be close to the US, since these two countries are relatively similar, compared to France and Germany where investor protection is rather weak.

We find that, even though the vast majority of share buyback announcements took place in the UK, in line with previous evidence (Rau and Vermaelen, 2002), because of corporate culture and relative lack of legal restrictions, the market valuation of repurchases amounts to only 1.68%, close to the 2.32% in Germany, though significantly higher than the 0.80% in France. In line with Renneboog and Trojanowski (2011), our results imply that besides the similarities between the US and the UK, there are still some differences in terms of corporate governance and institutional frameworks that might explain why in the UK the market reaction is relatively smaller than in the US. Moreover, the similarities in excess returns between the UK and Germany suggest that firms in weak investor protection countries are not less inclined to maximize shareholder value when they buy back their shares. This is contrary to Alzahrani and Lasfer (2012) and Brounen et al. (2004).

We relate our results to a number of other possible explanations. First, we test whether firms with recurring announcements generate lower excess returns. Since firms are able to publicly disclose more information than they are legally required, they are likely to do so more frequently to enjoy a greater reputation of transparency (von Eije and Megginson, 2008). Jagannathan and Stephens (2003) find that firms that actually repurchase shares infrequently enjoy a higher market reaction. However, to our knowledge, no study to date investigates in detail the short-term market reaction to the initial and subsequent announcements. We argue that the former is likely to significantly reduce any information asymmetries, and, therefore, the initial signal will carry higher information content as opposed to subsequent announcements. Consistent with these arguments, we find that the market reaction increases significantly to 2.01% for initial, compared to 0.98% for subsequent announcements. However, in France, the market reaction to both announcements is relatively similar.

Rosenthal and Sinha (2011) suggest that share buybacks announced in the post-1990s era do not necessarily lead to shareholder wealth maximization. Moreover, the credibility of their undervaluation signaling depends on whether repurchases are timed, for example, around executives' trades (Andriosopoulos and Hoque, 2014; Babenko et al., 2012; Bonaimé and Ryngaert, 2013; Chen et al., 2014). While we do not have data on insider trading around share repurchases announcements, we did find that the announcement date excess returns vary across time. We use natural experiments based on changes in regulatory regimes within and across our countries to assess further this time varying effect. We find that the November 2003 regulatory change in the UK, which allowed repurchases to be kept as treasury stock, affected substantially the market valuation of share repurchases as the announcement date market reaction decreased significantly from 2.95% to 0.72%. These results suggest that this reform has decreased the signaling role of share repurchases as it increased the ability of bad firms to announce share repurchases because the commitment to cancel the repurchased shares is alleviated. It may have also increased the shareholders' concerns of potential market manipulation via share repurchases.

Within this market manipulation context, we test the impact of the European Union's Market Abuse Directive 2003/6/EC ("MAD"), aimed at stabilizing financial instruments across Europe. The adoption of this directive can potentially have a positive effect, because it introduced a "safe harbor" for stock repurchases, as it reduced the cost of capital, and increased market liquidity (Christensen et al., 2012) and the propensity to buy back shares (Siems and De Cesari, 2012). Using the effective implementation date in each of our countries, we find no evidence that its implementation affected the market reaction to share repurchase announcements. Hence, our results also do not support the recent claims by the European Commission (FINNOV, 2012) that share repurchases are used to attain short-term boosts in share

prices. Similarly, unlike previous studies (e.g., Alzahrani and Lasfer, 2012; Grullon and Michaely, 2002; Keswani et al., 2007; Rau and Vermaelen, 2002), but in line with Bagwell and Shoven (1989) and Dittmar (2000), we don't find strong evidence that taxation affects the market valuation of share repurchases, independently of governance levels.

We contribute to the previously documented, predominantly single-country, market valuation of share repurchases in several ways. We show that across the three major European countries, the market reaction to share repurchases announcements is positive, but, compared to the US, the signaling effect is relatively small and depends on institutional settings. Moreover, in the US share prices decrease (increase) in the pre- (post-) announcement period (Ikenberry et al., 1995; Comment and Jarrell, 1991; Vermaelen, 1981), suggesting that managers announce their intention to buy back shares when they think that their firm is undervalued, but the market tends to under-react to such announcements, because it underestimates the extent to which the repurchase reduces the firm's cost of capital (Grullon and Michaely, 2004), or it assumes that all shareholders tender their shares, which is empirically incorrect, and creates the appearance of an under-reaction (Peyer and Vermaelen, 2009). We show that the excess returns are confined mainly to the announcement date, suggesting that share repurchases do not signal undervaluation, but, at the same time, they do not lead to under-reaction, in line with Ginglinger and L'Her (2006) in France, and Rau and Vermaelen (2002) and Oswald and Young (2004) in the UK. In the post-announcement period, the excess returns are positive only in the UK when repurchased shares are cancelled. Overall, unlike Bhattacharya and Dittmar (2003), we show that repurchases are not strong signals used solely by good firms for whom it is not costly to attract the market's scrutiny. Our results imply that bad firms do not refrain from announcing their intention to repurchase shares regardless of the fact that

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they may be scrutinized[1], as share repurchases trigger a moderate market reaction confined only to the announcement date. The relatively weak market reaction around share repurchases announcements in our countries is also not consistent with Huang and Thakor (2013) who argue that firms buy back their stocks to improve their investor-management disagreements, and/or the Banerjee et al. (2013) overconfident managers' excessive optimism.

The rest of the paper is organized as follows. Section 2 discusses the theoretical underpinning of our hypotheses. Section 3 presents the data and the methodology. Section 4 reports the empirical results. The conclusions are in Section 5.

2. Theoretical Background and Hypotheses Development

2.1. The impact of institutional and legal settings

Previous studies on the market reaction to share repurchases are predominantly focused on a single country (see, for example, Ikenberry et al. (2000) for Canada; Ginglinger and Hamon (2007) for France; Bessler et al. (2009) and Hacketal and Zdantchouk (2006) for Germany; Oswald and Young (2004) for the UK; and Ikenberry et al. (1995), Stephens and Weisbach (1998), Bonaimé (2012) for the US). We extend this analysis to a number of countries with different institutional settings.

The legislation on share repurchases is relatively standardized across the member countries of the European Union (EU). Unlike the US where repurchases are

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[1] Other studies show that the impact of signaling depends on the method of shares repurchases, as the market reacts more to the announcement of fixed price tender offer than to open market share repurchases (e.g. Grullon and Ikenberry, 2000; Louis and White, 2007; Vermaelen, 1981; Peyer and Vermaelen, 2009). However, since most firms use open market repurchases and many do not actually buy back their stock (Stephens and Weisbach, 1998) they are likely to be more concerned with the announcement of intention when the signal works (Bhattacharya and Dittmar, 2003; McNally, 1999).

approved only by the board of directors with no timing, price and volume restrictions, the EU legislation stipulates that firms need the shareholders' approval at the general shareholder meeting. This approval is for a maximum of 18 months, the proportion of shares to repurchase is limited to 10 % of the firm's issued capital, the repurchase price range is disclosed, and repurchases should be made out of distributable profits only.[2] These arguments suggest that the market valuation of repurchases and the impact of the reforms will be homogeneous across our countries, *ceteris paribus*.

However, there are significant regulatory differences across our countries. In France open market share repurchases became legal in July 2, 1998. This decision needs to be authorized by shareholders, and, up to 2004, indirectly by the *Autorité des marchés financiers*, AMF, the financial regulator.[3] The shares repurchased can be cancelled or kept as treasury stock (Ginglinger and Hamon, 2007). In Germany share repurchases were mainly illegal before May 1, 1998, as they are perceived to be a prohibited repayment of capital. In contrast, in the UK share repurchases have been legal since 1981, and share repurchased have to be cancelled, until 2003 when they can be keep as treasury stocks.

Our countries differ also in terms of information asymmetries, corporate culture, practices, and tax systems (Alzahrani and Lasfer, 2012; von Eije and Megginson, 2008). We focus on differences in terms of shareholder protection and ownership, corporate governance frameworks, and law enforcement (Faccio and Lang, 2000; La

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[2] These rules are included in the Second Council (Council of the European Communities) Directive 77/91/EEC in 1976. See Kim et al (2004) for details.

[3] Before 2004 buyback programmes needed to be adopted by the AGM and the announcement documents approved by the AMF. After 2004, shareholder approval is still required, but firms need to send only a note to the regulator explaining the repurchase programme, before disclosing the news to shareholders. We thank Edith Ginglinger from University Paris Dauphine for these clarifications.

Porta et al., 2000; Morck et al., 2005; Spamann, 2010). Since a share buyback is a popular form of corporate payout, it can be used for better aligning management's interests with those of outside shareholders when managers either own shares and/or have stock options in the firm (Brown et al., 2007). However, the regulatory framework that affects the level of shareholder protection directly affects the managers' ability to extract substantial benefits from minority shareholders such as the use of the firm's cash, leading to higher agency costs (La Porta et al., 2002). Therefore, in countries with lower investor protection managers will be more entrenched and, consequently, firms will hold more cash (e.g., Kalcheva and Lins, 2007; Dittmar et al., 2003), and shareholders will value firms' liquid assets at a discount (Pinkowitz et al., 2006). These arguments suggest that the institutional and regulatory heterogeneity across countries leads to differences in information asymmetries, management attitude toward shareholder value maximization, and the shareholders' ability to impose disciplinary controls on managers such as corporate payouts. We, therefore, expect a higher market valuation of share repurchases in the UK where shareholder protection is stronger than France and Germany, in line with Alzahrani and Lasfer (2012) and Brounen et al. (2004). Hence, our first hypothesis is:

H1: The market reaction to open market share repurchase announcements is higher in the UK compared to France and Germany.

2.2. *Initial vs. Subsequent announcement and market reaction*

It is widely documented that when firms announce their intention to repurchase shares the market reacts positively (Chan et al., 2004; Ginglinger and L'Her, 2006; Ikenberry et al., 1995; Vermaelen, 1981). Because of its encompassing nature as an investment, share repurchases (among other corporate decisions) have inherent benefits such as signaling of undervaluation, mitigation of agency costs, more tax-

efficient payout to shareholders, and debtholder expropriation, resulting in positive excess stock returns on the announcement day and in the post-event period. However, since open market repurchases are not firm commitments,[4] unlike cash dividends or tender offer buybacks,[5] they are costless signals (Huang and Thakor, 2013). On the other hand, Bhattacharya and Dittmar (2003) argue that such announcements attract the market's scrutiny and lead to a positive market reaction, because bad firms will not mimic this action to avoid being discovered. Consistent with these arguments, Bonaimé (2012) finds that firms with high prior completion rates are more credible and their announcements lead to higher excess returns.

We test the signaling hypothesis by focusing on the periodicity of repurchases. von Eije and Megginson (2008) argue that firms that make more frequent announcements can earn a reputation of transparency. Jagannathan and Stephens (2003) find that firms that do not repurchase shares frequently display a significantly higher market reaction during the three days of the share buyback. However, they analyze the deviation of the market reaction to varying frequencies of actual rather than the announcements of intention to repurchase. We focus on the latter and expect a higher market reaction for the initial repurchase announcements, as subsequent

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[4] Lie (2005) shows that investors cannot predict firms that actually repurchase their shares. Bonaimé (2012) and Stephens and Weisbach (1998) report average three-year buyback completion rates of about 70% of the targeted amount. This is because the signal has already worked as the market's scrutiny is attracted (Bhattacharya and Dittmar, 2003), and the goal of increasing the share price is achieved (McNally, 1999).

[5] The market reaction to fixed price share repurchases is higher (e.g. Grullon and Ikenberry, 2000; Louis and White, 2007; Vermaelen, 1981; Peyer and Vermaelen, 2005) because the premium paid on the tendered shares is seen by the market as a costly signal, thus bearing more credibility.

announcements are likely to be routine and the market is already more accustomed to their inherent information content. Therefore, our second hypothesis is:

H2: The initial announcement of intention to repurchase shares will result in greater market reaction than subsequent announcements.

2.3.   The impact of the EU market regulation

Since 2003, share repurchases have become subject to regulations under the provisions of the Market Abuse Directive, which intends to harmonize European securities regulations concerning the manipulation of financial markets.[6] This directive introduced common measures to prevent and detect market abuse and price manipulation, and to ensure a consistent and reliable flow of information to the market. To achieve this goal, this directive specified a set of provisions relating to the execution of share repurchase programs and especially their disclosure requirements, such as the daily volume of open market share repurchase activities and the price paid for the repurchased shares. Open market share repurchases are likely to be affected by this directive, because managers can time their announcements, even though the directive considers that they do not amount to market abuse if they qualify for the, so-called, safe harbor status, and conform to the requirements set out in the implementing measures. The impact of this reform depends on the existing national laws' disparity from the provisions of this directive and on the level of information asymmetry. In line with Siems and De Cesari (2012), we expect the implementation of this directive

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[6] This European Regulation no. 2273/2003 became effective in 1 July 2005 in the UK, with the adoption of the Financial Services and Markets Act 2000 (Market Abuse) Regulations 2005, in 24 November 2004 in France, with the publication of the AMF General Regulation, and in 29 October 2004 in Germany. For details, see Welch et al. (2005), each country's financial regulatory body, and http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003R2273:EN:HTML).

to decrease the market reaction to share repurchase announcements, as this reform increased market liquidity and decreased the costs of capital (Christensen et al., 2012), consequently mitigating information asymmetries.[7] This leads to our next hypothesis:

H3: The market reaction to open market share repurchases is lower following the Market Abuse Directive.

2.4.   Impact of the UK allowance to keep repurchased shares as Treasury stock

Over our sample period, a number of domestic institutional reforms occurred in our countries. We focus on the 2003 rule which allows UK companies to keep the shares repurchased as Treasury stocks. Before December 2003, companies were not allowed to do so as any repurchased shares are legally cancelled. The 2003 reform gave UK firms greater flexibility to manage their capital, because they are then able to use the repurchased shares as currency in future acquisitions, to reissue them at a later date at relatively low cost, and to increase their stock liquidity and reduce short-term price instability, thereby smoothing the price discovery (De Cesari et al., 2011). We, therefore, expect a reduction in the announcement date market reaction, even though the number of open market share repurchase announcements may have increased in the post-2003 period, because the enhancement in the flexibility of open market repurchases reduced the firms' commitment, as bad firms can easily mimic good firms, hence decreasing the signaling effect of the buyback announcement. Thus, our fourth hypothesis is the following:

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[7] We could not analyse directly the impact of the October 2004 domestic reform in France when firms are allowed to keep treasury stocks (up to 10% of capital), but they could not resell them in the market, and the end of the AMF certification (see note 6), as this event coincides with the date when the Market Abuse Directive became effective.

H4: The market reaction to open market share repurchases in the UK will be lower following the ability of firms to kept repurchased shares as Treasury stock.

3.   Data and Methodology

We search *Perfect Analysis* and *Factiva* databases for any news on the intention to repurchase ordinary shares in the open market in France, Germany and the UK. We hand-collect the announcement dates, the proportion and/or the number of shares the firms intend to repurchase.[8] We exclude repurchases of B-shares, preference shares, and American or Global Depositary Receipts (ADRs or GDRs) because they are less likely to be related to our testable hypotheses. Finally, we exclude firms with missing stock price and accounting data on DataStream. Our final sample includes 970 announcements of intention to repurchase shares in 1997 to 2006, split into 513 (53%) in the UK, 263 (27%) in France, and 194 (20%) in Germany.

Figure 1 shows the annual distribution of our sample and the number of cross-country announcements of intention to repurchase shares. The announcements are volatile, ranging from 13 in 1997 to 145 in 2006. Moreover, with the exception of 2000, the majority of announcements occurred in the UK where they picked in 2005, coinciding with the implementation of the EU directive. In France, there is a steady increase for the two years after share repurchases are made easier for firms to

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[8] Factiva provides several types of announcements, including (a) an initial statement of intention to obtain the shareholders' general meeting authorization for a share repurchase program, (b) a repurchase resolution passed by shareholders at a general meeting, and (c) the actual share buyback transactions. We focus only on (a). The standardization of the announcements dates increases the comparability of our results, as Hackethal and Zdantchouk (2006) find significant differences in the market reaction to the initial statements of German firms that seek the shareholders' approval for a share repurchase plan of +2.53%, compared to +5.97% for announcements of an imminent share repurchases.

undertake; reaching their peak in 2000. In Germany, the frequency is the lowest except in 2001 and 2005.

Table 1 reports the time lapsed from the initial announcement of intention to repurchase shares to the subsequent announcements made by the same firm through the following ten years under study. The table shows that the overwhelming majority of the subsequent announcements (approximately 63%) occurred within the same year the initial announcement took place. The remaining 17% and 7% of announcements occurred one and two years after the initial announcement of intention to repurchase shares, respectively. Overall, a very small sample of subsequent announcements extended more than three years.[9] Following Ikenberry et al. (1995), we apply a cut-off point of three years for classifying a share buyback announcement as a subsequent announcement.

[Insert Figure 1 and Table 1 here]

We use the standard event study methodology to assess the stock price behavior around the announcement of intention to buy back shares. The market model coefficients $\hat{\alpha}_i$ and $\hat{\beta}_i$ are computed from regressing the returns of firm i against a representative market index in each country. The market returns are based on the FTSE All Share Index, DAX, and SBF 250 for UK, Germany, and France, respectively. Our estimation period spans from -255 to -21, and the event period is

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[9] There are 84 announcements that occurred during 1997-1999, that are classified as initial announcements. We check whether these events are correctly classified as initial announcements. We find that only four have a preceding announcement during 1994-1996. The shortest time gap between the preceding announcements and the respective four announcements classified as initial in our sample is approximately 3 years, whereas the longest time gap is slightly more than 4 years. Therefore, the impact of treating these four announcements as initial announcements does not alter our findings.

from -20 to +20 trading days relative to the repurchase announcement, in line with Ikenberry et al. (1995), Peyer and Vermaelen (2005) and Zhang (2005). Following Ikenberry et al. (1995), we also report results based on [-1, +1] period to account for event date uncertainty.

4.   Empirical Evidence

4.1.   *Market reaction to the announcement of repurchases*

Table 2 reports the cumulative abnormal returns (CARs) over various event windows and Figure 2 shows the trend in daily excess returns around the event period. Unlike US evidence (e.g., Ikenberry et al., 1995) where stock prices decrease by 3.07% in the pre-event period, and increase by 3.54% during the event window [-1, +1], we find that the pre-announcement date CARs are not significant, and the event date CARs of +1.55% are lower.[10] For the post event period [+2, +20] the CARs are positive but not significant, while in the US, they tend to be positive and significant. Our results suggest that share repurchases in Europe are not likely to be driven by undervaluation and the market does not under-react to their announcements.

4.2.   *Impact of institutional and legal settings*

Since our results indicate that repurchases are not necessarily driven by undervaluation, we explore further the impact of other factors. Table 2 reports the distribution of excess returns across our countries to test for differences in institutional settings. The results indicate that the announcements date excess returns

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[10] The excess returns are 0.93% (Ikenberry et al., 2000) and 0.87% (McNally, 1999) in Canada; 0.55% in France (Ginglinger and L'Her, 2006); 2.53% (Hacketal and Zdantchouk, 2006) and 6.7% (Seifert and Stehle, 2003) in Germany; 1.08% (Rau and Vermaelen, 2002) and 1.24% (Oswald and Young, 2004) in the UK; and 2.57% (Grullon and Michaely, 2002) and 1.81% (Peyer and Vermaelen, 2005) in the US.

are significantly lower in France, but they are similar in Germany and the UK. Interestingly, while in France and Germany the pre- and post-announcement returns are not significant, there is some evidence of positive post-announcement drift, suggesting that the market may be under-reacting to the announcement of repurchases. The differences in market reaction across our countries suggest that our results may be affected by country effects, which we consider in our regressions. However, since UK and Germany generate similar excess returns, while their corporate governance systems are different, the positive market reaction to share repurchases is not likely to reflect the prospects of reducing agency costs.

4.3.   Reaction to initial vs. subsequent announcements

We test the hypothesis that the signaling role of share repurchases is stronger on the initial announcement, as subsequent announcements may be expected and become routine *(H2)*. Table 2 reports the CARs for each sub-group. Figure 2 portrays the daily CARs for the pooled sample across the three countries, while Figures 3A and 3B illustrate the country specific CARs. The results indicate significant differences across the two announcements. In particular, while the initial announcement results in excess returns of 2.01%, subsequent announcements generate significantly lower returns of only 0.98%. Overall, our results indicate that the initial announcements contain more information, but, since the returns on subsequent announcement dates are also significant, our results imply that they are not fully expected by the market.

We assess further this effect across our countries. The remaining columns in Table 2 indicate that the announcement date excess returns in France are relatively similar, and the rather smaller event-day positive performance is short lived, as the post-event returns are negative, although not significant. In contrast, in Germany and UK, the initial announcements carry significantly higher market impact, and the

subsequent announcements are not significant. In the UK, while the market reaction is positive and significant for both the initial and subsequent announcements, they carry on being significant only for the initial repurchases.

[Insert Table 2 and Figures 2, 3A and 3B here]

4.3.   The effects of regulatory changes

In this section we assess the impact of the 2003 Market Abuse Directive and the UK treatment of repurchases as treasury shares in 2003. Table 3 reports the impact of these reforms on the market valuation of share repurchases. We report these effects separately for each country as the exact enactment of the EU directive is not standardized across our countries.

In France this reform did not have any major impact. In contrast, in Germany, the EU Directive reduced significantly the announcement dates excess returns from 2.97% to 1.04%. Moreover, prior to its adoption, the pre-announcement returns are negative and significant. However, since the post-announcement returns are not statistically significant both before and after its implementation, we conclude that it is only before the enactment of this directive that firms are more likely to repurchase shares because of short term undervaluation.

In the UK, we start first by analyzing the impact of the regulation on the accounting treatment of repurchased shares. The results show that the announcement date excess returns decreased significantly from 2.95% before the regulation that made repurchased shares to be cancelled to 0.72% when they can be treated as treasury stocks. Panel B shows that this drop is highly significant relative to the remaining periods, in line with our predictions in hypothesis *H4*. The results suggest that, by enabling firms to keep repurchased shares as treasury shares, which could be floated again in the market, thereby smoothing the price discovery (De Cesari et al.,

2011), the signaling role of share repurchases became weaker. This is because before this regulation firms were required to cancel the repurchased shares, thus, leaving smaller room for potential market interference, and low quality firms would be less likely to mimic good firms.

Following the implementation of the EU Directive, the excess returns decreased further to 0.41%. Even though the event day reaction is significantly different from the first sub-period when repurchased shares are cancelled, it is not significantly different from the market reaction during the second sub-period when they can be kept as treasury stocks. The results provide only partial support for hypothesis *H3*. Moreover, while in the pre-announcement dates none of the excess returns are significant, in the post-event period they are positive and significant when shares repurchased are cancelled and when the directive is implemented. However, since Panel B shows that the announcement date excess returns are not statistically different across these two periods, we conclude that the implementation of this reform does not have a significant effect on the market reaction to repurchases in the UK, in line with France, above. This is probably because most of the directive's new requirements, including the disclosure of the objective of the program, the maximum number of shares to be acquired, and the duration of the period for which authorization for the program has been given, are similar to the national regulation, and, thus, they were already undertaken by firms in these countries.

[Insert Table 3 here]

4.4.   *The drivers of the announcement-date market reaction*

Our univariate results could be affected by firm and other country fundamentals, and by time effects, as Amihud and Li (2006) find that the overall effect of dividend increase announcements on prices has declined over time, particularly since the tax

and regulatory changes are relatively more recent. We account for these effects by running the following pooled regressions:

$$CAR_{i,t} = \alpha + \beta_1 Rule\ of\ Law_{i,t} + \beta_2 \operatorname{Re}gulatory\ Quality_{i,t} + \beta_3 Initial_{i,t} + \beta_4 EU\ Directive + \beta_5 Treasury_{i,t}$$
$$+ \beta_6 Tax\ Differntia\ l_{i,t} + \beta_7 Leverage_{i,t-1} + \beta_8 MB_{i,t-1} + \beta_9 \operatorname{Re}turns_{i,t-1} + \beta_{10} Size_{i,t-1}$$
$$+ \beta_{11} Ownership\ Concentrat\ ion_{i,t-1} + \beta_{12} Cash_{i,t-1} + \beta_{13} Dividend_{i,t-1} + \beta_j Secondary\ Market + \varepsilon_{i,t} \qquad (1)$$

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. We include dummies to control for industry effects. The summary statistics are reported Appendix 1.[11]

Our first hypothesis stipulates that the market reaction will be higher in countries with high governance systems. Following Pinkowitz et al. (2006), we control for country effects using two indices developed from the *International Country Risk Guide* (ICRG): *Rule of Law* and *Regulatory Quality* which account for investor protection and the rule of law. We find similar results when we use country dummy variables. We test the predictions of our second hypothesis that the initial announcement causes a greater market reaction than the subsequent announcements by including *Initial,* a binary variable equal to one for initial announcement and zero otherwise. We control for the impact of the EU Market Abuse Directive, as discussed in our third hypothesis with the variable *EU Directive*, which is equal to one when an share buyback announcement occurred after the EU directive became effective in each country and zero otherwise. Finally, we employ *Treasury*, a binary variable equal to one if the announcements in the UK are made in the post-December 2003 period, to test our fourth hypothesis.

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[11] We also replicate our estimations by running country-level regressions. The results, not reported for space considerations, remain qualitatively the same.

We use a number of control variables identified in previous studies to have an impact on the market valuation of share repurchases. All the accounting based variables are lagged one year. We follow Dittmar (2000) and Grullon and Michaely (2002) and define *leverage* as the ratio of total debt to total assets at the end of the calendar year prior to the announcement date. We find similar results when we use the median net debt to total assets ratio of each respective industry of the repurchasing firm, at the end of the calendar year prior to the announcement, and net debt to total assets ratio, as in Dittmar (2000). We expect leverage to be positively related to the announcement date excess returns. We use a number of variables to capture the undervaluation hypothesis which predicts that firms repurchase their shares when their current share price is, according to the managers who are expected to be better informed than the market, lower than its true value (e.g. Ikenberry et al., 1995; Jagannathan and Stephens, 2003; Dittmar, 2000). The first is the *Pre 20-days return*, defined as the daily cumulative market adjusted return for the period of 22 to 2 days prior to the announcement date, as a proxy for the short term undervaluation. To capture the longer period undervaluation and momentum effect, we use the daily cumulative market adjusted return for the period of 255 to 2 days prior to the announcement date, *Pre 1-year return*, and *MB*, the market to book ratio, as Ikenberry et al. (1995) report that firms with low MB earn abnormal returns in the subsequent periods, in line with the undervaluation hypothesis. This hypothesis also suggests that repurchasing firms have a high degree of information asymmetry, which is likely to be prevalent in small firms, since they have less coverage by analysts and the media (Vermaelen, 1981). As in Dittmar (2000), Grullon and Michaely (2002), and Renneboog and Trojanowski (2011), we use *Size*, the natural logarithm of a firm's market capitalization, to proxy for this effect. We find similar results when we use the book value of total assets as a size proxy.

Oded (2011) assesses the differences of open market share repurchases and tender offers from a shareholder ownership perspective, predicting that a higher ownership concentration will lead to a higher likelihood of an open market share repurchase, since only large shareholders can bear the associated information costs in tender offers. In contrast, the higher the ownership concentration the higher the level of adverse selection, and, hence, the higher the premium involved in share buyback. Moreover, higher ownership concentration leads to information asymmetry that is higher (lower) for smaller (large) shareholders. We follow Mitchell and Dharmawan (2007) and employ *Ownership concentration,* the ratio of closely held shares[12] over the number of shares outstanding, to control for this effect.

The excess cash flow hypothesis stipulates that firms repurchase their stock to distribute their excess capital and to mitigate the potential agency conflicts (Jensen, 1986). Grullon and Michaely (2004) find that repurchasing firms decrease their capital expenditures and research and development expenses, while Oswald and Young (2008) find that non-repurchasing firms are more likely to overinvest. Similarly, Dittmar (2000) and Mitchell and Dharmawan (2007) find that firms with excess cash and fewer investment opportunities are more likely to repurchase their shares. We include *Cash*, defined as the firm's net income before taxes plus depreciation and changes in deferred taxes and other deferred charges over total assets, at the end of the year prior to the share repurchase announcement.

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[12] The variable *closely held shares* is taken from Worldscope database, and represents shares held by insiders, officers, directors and their immediate families, in trust and by any other corporation (except shares held in a fiduciary capacity by banks or other financial institutions), pension/benefit plans, and individuals who hold 5% (3% in UK) or more of the outstanding shares. It excludes shares under option exercisable within sixty days, shares held in a fiduciary capacity, those held by insurance companies, and preferred stock or debentures that are convertible into common shares.

The tax differential between dividend and capital gains can make share repurchases more valuable to shareholders than cash dividends when capital gains tax rate is lower than the personal income tax rate (e.g., Grullon and Michaely, 2002). However, the empirical evidence provided to date on the tax impact is mixed. While Bagwell and Shoven (1989), Julio and Ikenberry (2004) and Dittmar (2000) for US and Oswald and Young (2008) for UK find no evidence that tax regulations affect significantly payout policies, Chetty and Saez (2005) find a strong impact of the 2003 dividend tax reform in the US, and Brown et al. (2007) show that this tax reform affected the payout choice, enhancing the substitutability between cash dividends and buybacks. Alzahrani and Lasfer (2012) find that corporate payouts are affected by tax, corporate and institutional factors. Grullon and Michaely (2002), Keswani et al. (2007), Lie and Lie (1999) and Rau and Vermaelen (2002) show that when more favorable measures are taken towards share repurchases, then both share repurchasing announcements and activity increase. Lie and Lie (1999) report that managers are more sensitive to the shareholders' tax threshold when a large fraction of 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. We follow Alzahrani and Lasfer (2012) and include *Tax Differential*, the ratio of effective income tax relative to the effective tax on share buybacks, to test for the effect of tax.

Grullon and Michaely (2002) argue that, in addition to the tax advantage, share buybacks substitute cash dividends due to the flexibility on the timing and execution. Jiang et al. (2013) find that managers consider both dividends and share buybacks when making a payout, suggesting that these two cash disbursements are substitutes. Skinner (2008) finds that younger firms that have not paid cash dividends are more likely to repurchase their shares instead of committing to pay cash dividends, and that the overall significance of dividend payers is diminishing over time, suggesting that

share repurchases become the dominant form of payouts. However, Jagannathan et al. (2000), Dittmar (2000) in the US, and Mitchell and Dharmawan (2007) in Australia find that share repurchases supplement cash dividends. In their extensive review on payout policies, Farre-Mensa et al. (2014) conclude that changes in compensation practices and management incentives are better able to explain the significant substitution of cash dividends by repurchases which became the prime vehicle for corporate payouts over the last 30 years, than the traditional motives, such as taxes, agency costs and signalling. We use *Dividend*, the ratio of cash dividends to earnings, to account for these effects.[13]

Finally, we control for firms listed in secondary markets and include the dummy variables AIM and Neuer Markt, which take the value of one for firms listed in the UK and German secondary markets, respectively and zero otherwise.

Panel A of Table 4, reports the results from the pooled regressions. We do not find strong evidence of the impact of the investor protection indices on the market reaction to the announcement of share repurchases, in line with our univariate results, suggesting that share repurchases are less likely to be driven by agency conflicts. These results do not provide support to our Hypothesis *H1*. In contrast, there is some evidence that the initial announcement carries higher information content, and, in effect, causing a stronger market reaction, which is consistent with our hypothesis *H2*. Similarly, the dummy for the change in the accounting treatment of repurchases in the UK, *Treasury*, is mainly negative and significant, suggesting that the signaling role of repurchases is reduced when UK companies are allowed to keep shares repurchased

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[13] We also follow Oswald and Young (2008) and use a dummy variable equal to one if a firm has paid cash dividends in the year prior to the repurchasing announcement and zero otherwise, and we use the ratio of total cash dividends divided by total assets and dividend yield. The results remain the same.

as treasury stocks. These results provide support for hypothesis *H4*, and reflect also the market's concern over potential market interference by the firm with their increased flexibility of floating again the repurchased shares.

The EU Directive is not significant, suggesting that the impact of the implementation of this reform and the amendments of the disclosure's obligations pertaining to share repurchases from this directive, have not affected the market valuation of share repurchases. These results do not provide support to our hypothesis *H3*. In unreported results, we find no impact of the EU Directive on the market reaction in any specific country in our sample. This is probably because most of these new requirements, including the disclosure of the full details of the program, the maximum number of shares to be acquired, and the duration of the period for which authorization for the program has been given for firms to benefit from the safe harbor provided by the buyback regulation, are already part of the national legislations. These results are consistent with our previous findings from the univariate analysis.

In terms of control variables, Table 4 indicates that leverage does not have a strong impact, suggesting that share repurchases are not likely to be undertaken to increase leverage and gain from the tax shields. Firm size is inversely related to the market's reaction to share repurchases, in line with Ikenberry et al. (1995) and Grullon and Michaely (2002). This is due to higher information asymmetries experienced by smaller firms which draw the market's scrutiny with their intention to repurchase shares, as argued by Bhattacharya and Dittmar (2003), consequently leading to a higher market reaction. The impact of signaling undervaluation is mixed as, while the coefficient of the *Pre-One-Year Returns* is negative and significant, MB is not significant, and the *Pre-20-Days Returns* are positive, in contrast to the prediction of this hypothesis (Ikenberry et al., 1995; Stephens and Weisbach, 1998).

Ownership concentration is not statistically significant while cash holding is negative, suggesting that the market prefers the free cash flow to be retained rather than returned to the shareholders in the form of share repurchases. These results complement the findings based on the *Rule of Law* and *Regulatory Quality*, and suggest that, in contrast to the predictions of our hypothesis *H1*, the market does not strongly view repurchases as a way of mitigating the agency conflicts.

The results show no evidence of dividends having an impact on the market reaction to share buybacks, suggesting that share buybacks and cash dividends are independent, in contrast to Jagannathan et al. (2000) who show that they are complimentary. The tax differential variable has a mixed impact on the market reaction, suggesting the market does not value fully the tax saved by shareholders when firms buyback their shares instead of paying dividends. Finally, the positive impact of Neuer Markt is consistent with Bessler et al. (2009) who find a market reaction of 5.88% for Neuer Markt firms and 1.65% for DAX/MDAX firms, suggesting that small and high-growth firms are more likely to experience a higher market reaction, in line with the information asymmetry hypothesis. However, this does not apply to firms listed in AIM.

[Insert Table 4 here]

4.5. Robustness checks

We use a number of additional tests to assess the robustness of our results. First, we check that the results are not driven by a potential selection bias of which announcement is classified as initial or subsequent by running our regressions only for the sub-sample of initial announcements. The results reported in Panel B of Table 4, remain qualitatively the same. The only major exception is the significance of *Rule of Law*, which is positive and significant, and *Treasury* became less significant.

We then consider the potential sample selection bias (Heckman, 1979) using the Heckman et al. (1997) two-stage estimation procedure. In the first stage we estimate a probit model with the dependent variable equal to one if a firm makes an announcement of its intention to repurchase shares and zero otherwise, across all listed firms in the three countries, during the time span of our study. We use a number of explanatory variables commonly used in the payout policy literature, including firm size, market-to-book, leverage, ownership concentration, cash, and dividend yield, along with the variables rule of law and regulatory quality to control for country effects, and industry and time dummies. From the first stage we estimate the inverse Mill's ratio which is then included as an additional control variable in the second stage regressions where the dependent variable is the event window market announcement $CAR_{i,-1,+1}$. The results reported in Table 5 show that the inverse Mill's ratio is not significant across any model specification suggesting there is no sample selection bias. Moreover, even with the inclusion of the statistically insignificant Inverse Mill's ratio, our results remain qualitatively the same. Therefore, the results reported in Table 4 are robust and do not suffer from self-selection bias.

[Insert Table 5 here]

5.   **Conclusions**

We analyze the impact of various cross-country institutional settings on the market reaction to the announcement of open market share repurchases across major European countries. We find that the average market reaction is lower than in the US and is not dependent on the level of investor protection, as there is no significant difference between Germany and the UK, even though the excess returns are smaller in France. Second, we find that the market valuation depends on the periodicity of the announcements. Since many European firms announce repurchases continuously

through time, we find significantly higher announcement date excess returns to the initial announcement, suggesting that the first announcement significantly reduces any information asymmetries, and, therefore, its signal carries higher information content as opposed to subsequent announcements. Third, we report that the adoption of the EU Market Abuse Directive which introduced a more rigorous disclosure regime, hence aiming to reduce information asymmetries, did not affect significantly the market reaction to share repurchases announcements. Siems and De Cesari (2012) argue that open market repurchases can be considered as a way of manipulating the market. Therefore, the adoption of this directive is expected to reduce the propensity of firms to announce their intention to buy back shares, and consequently, they would do so only in the case when the information content is low. Our results imply that this legislation may not have achieved its aim of restricting companies from potential market manipulation, as it did not have any impact on the announcement date market reaction to repurchases. Nevertheless, since subsequent EU legislation provided a safe harbor for share repurchasing firms, our results imply that the new requirements on buybacks are not informative. Finally, we find a significant drop in excess returns following the change in legislation in the UK that allowed companies to treat their repurchased shares as treasury stocks.

Our analysis may suffer from a set of limitations beyond our control. Since many of our sample firms are international, they may not be subject to regulations of their country of registration. They may also have other ways of managing their leverage, signaling and dividends, and their accounting numbers may not be comparable. We also do not have data on firm level shareholding and their respective tax rates to compute the preferences for repurchases. While these issues are beyond the scope of our research because of data unavailability, the extent to which their inclusion will strengthen or alter our results is a subject of further research.

Table 1. Sample description and 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 356 subsequent announcements, of which 211, 79 and 66 are made in the UK, France and Germany, respectively. The total number of announcements (including unique announcement) is 970 split into 513 in the UK, 263 in France and 194 in Germany over the period 1997 to 2006.

	All countries			United Kingdom			France			Germany		
	N	% of subsequent	% of Total	N	% of subsequent	% of Total	N	% of subsequent	% of Total	N	% of subsequent	% of Total
0-1 year	225	63.20%	23.20%	146	69.19%	28.46%	37	46.84%	14.07%	42	63.64%	21.65%
1 to 2 years	61	17.13%	6.29%	32	15.17%	6.24%	14	17.72%	5.32%	15	22.73%	7.73%
2 to 3 years	25	7.02%	2.58%	14	6.64%	2.73%	7	8.86%	2.66%	4	6.06%	2.06%
3 to 4 years	17	4.78%	1.75%	8	3.79%	1.56%	8	10.13%	3.04%	1	1.52%	0.52%
4 to 5 years	15	4.21%	1.55%	2	0.95%	0.39%	11	13.92%	4.18%	2	3.03%	1.03%
5 to 6 years	6	1.69%	0.62%	4	1.90%	0.78%	0	0.00%	0.00%	2	3.03%	1.03%
6 to 7 years	5	1.40%	0.52%	3	1.42%	0.58%	2	2.53%	0.76%	0	0.00%	0.00%
7 to 8 years	1	0.28%	0.10%	1	0.47%	0.19%	0	0.00%	0.00%	0	0.00%	0.00%
>8 years	1	0.28%	0.10%	1	0.47%	0.19%	0	0.00%	0.00%	0	0.00%	0.00%
Announcements												
Subsequent	**356**	**100%**	**36.70%**	**211**	**100%**	**41.13%**	**79**	**100%**	**30.04%**	**66**	**100%**	**34.02%**
Initial	**614**		**63.30%**	**302**		**58.87%**	**184**		**69.96%**	**128**		**65.98%**
Total	**970**		**100%**	**513**		**100%**	**263**		**100%**	**194**		**100%**

Table 2. Cumulative average abnormal results for selected event windows

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. The sample consists of 970 announcements of intention to repurchase shares on the open market in 1997 to 2006, of which 513 took place in the UK, 263 in France, and the remaining 194 in Germany. The abnormal returns are based on the market model with the coefficients computed over the -255 to -21 days before the announcement date. Initial announcements are announcements that appear for the first time in the sample through the ten year period of this study. Subsequent announcements are defined as announcements after the initial announcement. The t-statistics of the differences in means between our groups are reported in parentheses. ***, **, * indicate $p < 0.01$, < 0.05, and < 0.1, respectively. [a] denotes $p < 0.1$ for the difference in mean average abnormal returns between UK and France; [b] UK and Germany, and [c] France and Germany.

	All Countries			UK			France			Germany		
	Entire Sample	*Initial*	*Subsequent*	*Entire Sample*	*Initial*	*Subsequent*	*Entire Sample*	*Initial*	*Subsequent*	*Entire Sample*	*Initial*	*Subsequent*
N	*970*	*614*	*356*	*513*	*302*	*211*	*263*	*184*	*79*	*194*	*128*	*66*
CAR -20,-2	-0.34%	-0.39%	-0.59%	[b]0.13%	0.29%	-0.68%	-0.48%	-0.72%	0.10%	[b]-1.42%	-1.51%	-1.13%
		(0.307)			*(1.235)*			*-0.574*			*-0.261*	
CAR -1,+1	1.55%***	2.01%***	0.98%**	[a]1.68%***	[a]2.34%***	1.02%***	[a,c]0.80%**	[a,c]0.74%**	0.94%*	[c]2.32%***	[c]3.07%***	0.90%
		(2.839)			*(2.777)*			*-0.358*			*(2.070)*	
CAR +2,+20	0.31%	0.32%	0.18%	[a]0.91%*	[a]1.32%**	0.16%	[a]-0.67%	[a]-1.06%	0.25%	0.09%	-0.01%	0.18%
		(0.207)			*(1.668)*			*-1.185*			*-0.082*	

Table 3. Impact of regulatory changes.
The table reports the CARs across different regulatory changes sub-periods, namely the 2003 EU Directive, and the change in UK regulations that allowed the repurchased shares to be kept as treasury stock after 31/11/2003. The dates of implementation for the 2003 EU Directive in each country are from Welch et al. (2005) and the respective financial regulatory bodies. The sample includes 970 announcements of intention to repurchase shares on the open market (513 in the UK, 263 in France, 194 in Germany) from 1997 to 2006. The abnormal returns are based on the market model with the coefficients computed over the -255 to -21 days before the announcement date. The p-values of the Welch F-test of means equality are in parentheses, and the number of observations for each sub-period is in brackets. Panel B reports the matrix containing the differences in CARs across the three sub-periods in the UK. ***, **, * indicate $p < 0.01$, < 0.05, and < 0.1, respectively.

Panel A. Impact of Regulatory and Tax Changes per Country			
Time Periods	-20 to -2	-1 to +1	+2 to +20
France			
01/01/1997 to 23/11/2004 [184] (1)	-0.55%	0.79%**	-0.32%
(Directive 2003/6/EU)			
24/11/2004 to 31/12/2006 [79] (2)	-0.37%	0.82%**	-1.98%**
p-value Welch F-test	**0.900**	**0.956**	**0.215**
Germany			
01/01/1997 to 28/10/2004 [129] (1)	-2.24%**	2.97%***	0.74%
(Directive 2003/6/EU)			
29/10/2004 to 31/12/2006 [65] (2)	-0.22%	1.04%***	-1.19%
p-value Welch F-test	**0.094**	**0.036**	**0.380**
UK			
01/01/1997 to 31/11/2003 [279] (1)	0.47%	2.95%***	1.26%**
(Repurchased shares can be kept as treasury shares)			
01/12/2003 to 30/06/2005 [117] (2)	-0.30%	0.72%***	-0.55%
(Directive 2003/6/EU)			
01/07/2005 to 31/12/2006 [117] (3)	-0.26%	0.41%**	1.55%***
p-value Welch F-test	**0.655**	**0.000**	**0.009**

Panel B. Impact of Regulatory and Tax Changes in the UK (Differences in Means)						
	-20, -2		-1, +1		+2, +20	
01/01/1997 to 31/11/2003 [279] (1) (Repurchases kept as treasury shares)	1		1		1	
01/12/2003 to 30/06/2005 [117] (2) (Directive 2003/6/EU)	0.770% (0.498)	1	2.230%*** (0.001)	1	1.810%* (0.063)	1
01/07/2005 to 31/12/2006 [117] (3)	0.730% (0.531)	-0.040% (0.957)	2.540%*** (0.000)	0.310% (0.596)	-0.290% (0.775)	-2.100%*** (0.009)

Table 4. Drivers of the market reaction to share repurchase announcements.

The dependent variable is $CAR_{i,-1\ to\ +1}$, the three-day cumulative abnormal return around the share repurchase announcement. Panel A reports the OLS estimation outputs for the entire pooled sample. Panel B reports the OLS estimation outputs only for the Initial announcements sub-sample. *Rule of law* and *Regulatory Quality* are indices measuring the quality of investor protection obtained from the *International Country Risk Guide*. *Initial* is a binary variable equals to one for initial announcements, and zero otherwise. *EU Directive* is a binary equal to one following the implementation date in each country. *Treasury* is a binary variable equal to one for post-Dec. 1st, 2003 announcements when repurchased shares can be kept as treasury shares in the UK. *Tax differential* is the ratio of effective tax paid on dividends relative to capital gains tax. *Leverage* is the ratio of total debt to total assets. *MB* is the market to book value of equity, winsorized at the 1st and 99th percentile. *Pre-One-Year Returns* the cumulative abnormal returns one year before the announcement date, and *Pre-20-Days Returns* the daily cumulative market adjusted return for the period of 22 days prior and 2 days prior to the repurchase announcement. *Size* is the natural logarithm of a firm's market value. *Ownership Concentration* is the percentage 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. *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. *Dividend* is the ratio of total cash dividends to net income. *AIM (Neuer Markt)* is a binary variable equal to one for firms listed on the London Alternative Investment Market (German Neuer Markt) and zero otherwise. The accounting and ownership variables are at the end of the calendar year prior to the repurchase announcement. All our regressions include industry dummies. The p-values are based on cluster-adjusted robust standard errors at the firm level (Petersen, 2009) and are reported in parentheses. ***, **, * indicate p <0.01, <0.05, and <0.1, respectively.

	Panel A All announcements			Panel B Initial announcements only		
	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 5	Eq. 6
Constant	-0.092**	-0.042	-0.042**	-0.170***	-0.091	-0.047**
	(0.027)	(0.383)	(0.010)	(0.001)	(0.112)	(0.019)
Rule of Law	0.069	0.040		0.175***	0.131*	
	(0.241)	(0.528)		(0.006)	(0.084)	
Regulatory Quality	0.045*	0.016		0.059*	0.030	
	(0.079)	(0.525)		(0.068)	(0.315)	
Initial	0.008*		0.007*			
	(0.078)		(0.094)			
EU Directive	-0.006	-0.003	-0.003	-0.003	-0.001	0.002
	(0.180)	(0.460)	(0.514)	(0.582)	(0.932)	(0.738)
Treasury	-0.011	-0.015**	-0.014**		-0.011	-0.014*
	(0.106)	(0.025)	(0.017)		(0.215)	(0.059)
Leverage	0.010	0.027*		0.012	0.037	
	(0.474)	(0.090)		(0.512)	(0.136)	
MB		0.000			0.000	
		(0.937)			(0.557)	
Pre 1-year returns	-0.015**			-0.022***		
	(0.043)			(0.001)		
Pre 20-days returns		0.314***			0.266***	
		(0.000)			(0.002)	
Size		-0.003**			-0.004**	
		(0.013)			(0.017)	
Ownership concentration		0.000			0.000	
		(0.401)			(0.795)	
Cash		-0.051**	-0.063***		-0.039	-0.054**
		(0.027)	(0.002)		(0.120)	(0.021)
Tax Differential	0.004	0.028	0.043***	-0.041	-0.008	0.047**
	(0.900)	(0.362)	(0.004)	(0.146)	(0.823)	(0.013)
Dividend	0.001	0.002	0.002	0.001	0.002	0.002
	(0.356)	(0.115)	(0.143)	(0.401)	(0.192)	(0.148)
AIM	0.014	0.016	0.016	0.022	0.018	0.024
	(0.254)	(0.342)	(0.174)	(0.170)	(0.387)	(0.150)
Neuer Markt	0.031**	0.023	0.026*	0.041**	0.042**	0.039**
	(0.019)	(0.111)	(0.050)	(0.013)	(0.042)	(0.015)
Obs.	878	761	848	555	463	532
Adj. R²(%)	8.39	19.02	9.99	15.49	20.27	12.20

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Table 5. Robustness checks

This table controls for self-selection bias on the drivers of the market reaction to share repurchase announcements. The dependent variable is $CAR_{i,-1,+1}$, the three-day cumulative abnormal return around the share repurchase announcement. Equation 1 reports the probit estimation outputs for the first stage of Heckman's (1997) two stage approach, where we estimate a probit model with the dependent variable *(buyback)* is equal to one if a firm makes an announcement of its intention to repurchase shares and zero otherwise, across all listed firms in the three countries, during the time span of our study. From the first stage we estimate the inverse Mill's ratio which is then included as an additional control variable in the second stage regressions. The second stage regressions are reported in Equations (2)-(7), where the dependent variable is the event window market announcement $CAR_{i,-1,+1}$. The remaining variables are defined as in Table 4. All regressions include industry dummies. The p-values are based on cluster-adjusted robust standard errors at the firm level (Petersen, 2009) and are reported in parentheses. ***, **, * indicate p <0.01, <0.05, and <0.1, respectively.

	Buyback			$CAR_{i,-1 \text{ to } +1}$			
	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 5	Eq. 6	Eq. 7
Inverse Mill's ratio		-0.002	-0.004	0.002	-0.007	0.002	-0.001
		(0.452)	(0.165)	(0.518)	(0.154)	(0.442)	(0.843)
Constant	-19.336***	0.006	0.007	-0.128***	0.026	-0.084*	0.027
	(0.000)	(0.359)	(0.292)	(0.007)	(0.720)	(0.063)	(0.706)
Rule of Law	18.832***			0.070	0.029	0.046	-0.106
	(0.000)			(0.265)	(0.667)	(0.452)	(0.313)
Regulatory Quality	-4.295***			0.055**	0.031	0.035	-0.129
	(0.000)			(0.030)	(0.264)	(0.191)	(0.108)
Initial				0.008*			0.007
				(0.080)			(0.136)
EU Directive					-0.003	-0.006	0.002
					(0.559)	(0.156)	(0.801)
Treasury				-0.014**	-0.011	-0.015**	-0.030**
				(0.026)	(0.117)	(0.015)	(0.035)
Leverage	0.000***			0.019	0.024		0.017
	(0.000)			(0.216)	(0.145)		(0.314)
MB	0.033***				0.000		0.000
	(0.004)				(0.629)		(0.837)
Pre 1-year returns				-0.011**	-0.012		
				(0.021)	(0.186)		
Pre 20-days returns						0.311***	
						(0.000)	
Size	0.984***				-0.010***		
	(0.000)				(0.016)		
Ownership Concentration	-0.001				0.000		0.000*
	(0.505)				(0.339)		(0.050)
Cash	-0.006***				-0.050**	-0.050**	-0.045**
	(0.000)				(0.035)	(0.027)	(0.038)
Tax Differential				0.013	0.004	0.026	0.140**
				(0.665)	(0.910)	(0.413)	(0.029)
Dividend	-0.078***			0.002	0.003*	0.002	0.002
	(0.000)			(0.268)	(0.071)	(0.241)	(0.193)
AIM			0.018	0.016	0.003	0.021	0.009
			(0.243)	(0.317)	(0.837)	(0.243)	(0.557)
Neuer Markt			0.023	0.020	0.015	0.026*	0.026
			(0.176)	(0.224)	(0.353)	(0.076)	(0.101)
Industry dummies	✓	✓	✓	✓	✓	✓	✓
Year dummies	✓						
Obs.	17,755	761	761	761	761	761	761
Adj. R^2(%)	57.89	04.88	05.61	09.64	12.00	17.48	12.11

Figure 1. Annual Distribution of Announcements of Share Repurchases.
This figure shows the annual number of open market share repurchase announcements for each country. The sample includes 970 open market share repurchases announcements over the period 1997 to 2006, split into 513 in the UK, 263 in France, and the remaining 194 in Germany.
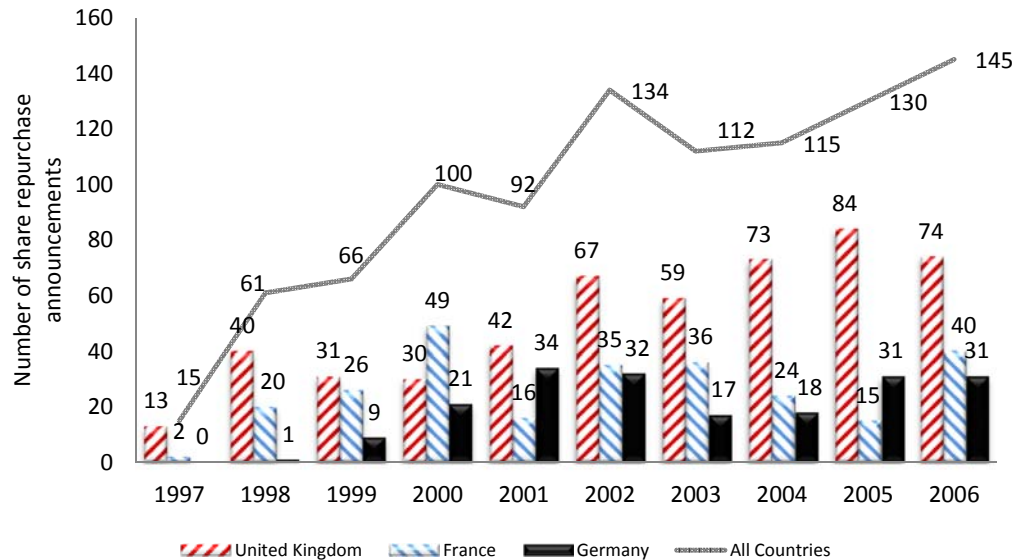

Figure 2. CARs for Entire Sample.
Figure 2 shows the cumulative average abnormal returns for the forty-day period surrounding the announcement date [-20 to +20] for the entire sample. In Figure 2B we distinguish between initial and subsequent announcements. The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the UK, 263 in France, and the remaining 194 in Germany over the period 1997 to 2006.

Figure 3A. CARs per country.

Figure 3A shows the cumulative average abnormal returns for the forty-day period surrounding the announcement date [-20 to +20] for each country. In Figure 3B we distinguish between initial and subsequent announcements. The sample consists of 970 announcements of intention to repurchase shares on the open market of which 513 took place in the UK, 263 in France, and the remaining 194 in Germany over the period 1997 to 2006.
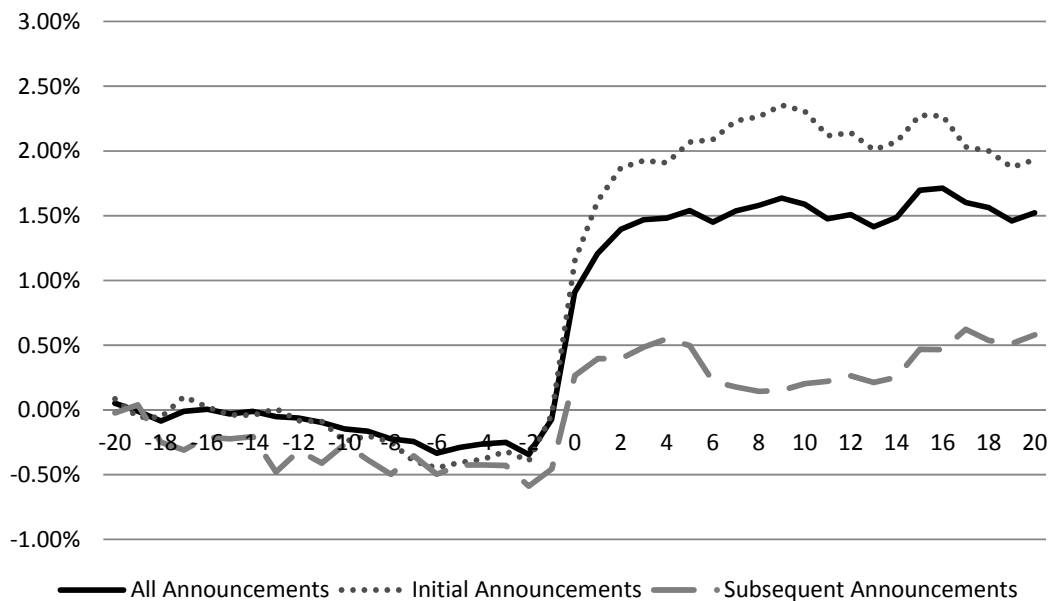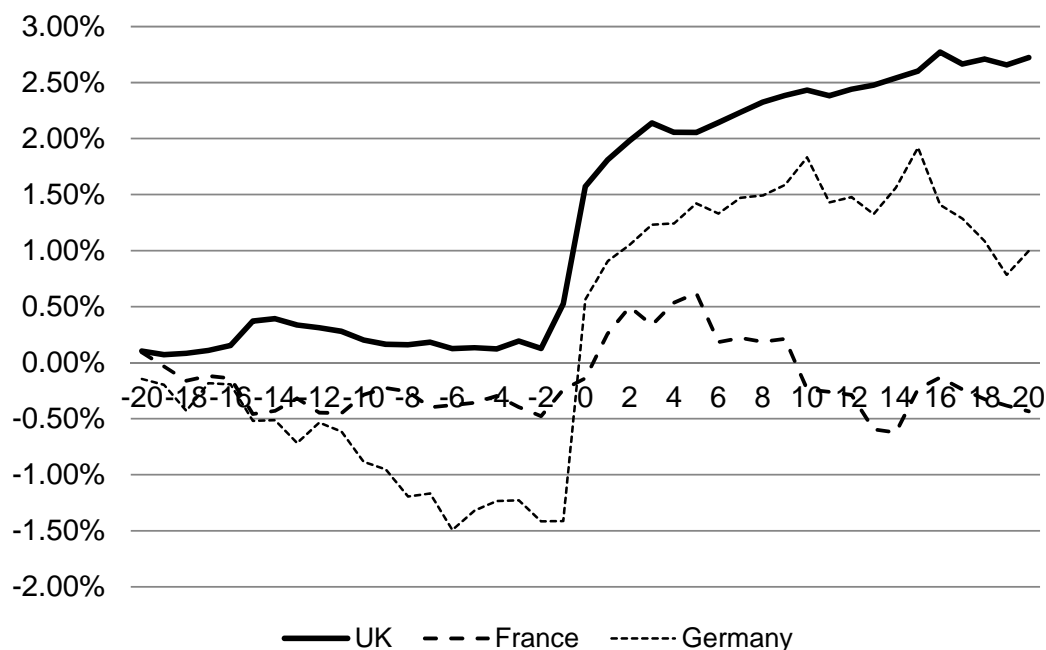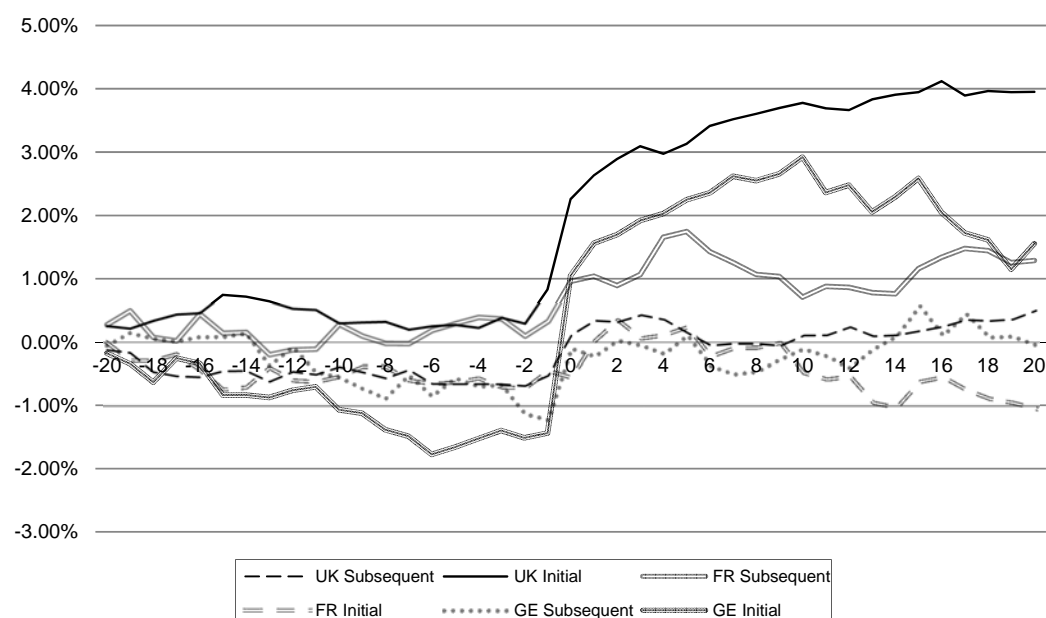

Figure 3B. CARs for Initial and Subsequent Announcements.

Appendix 1. Summary statistics for cross-sectional regression variables

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 program 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. CAR$_{(-1,+1)}$ is the three-day cumulative abnormal return around the share repurchase announcement. *Leverage* 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. *MB* is the market to book value of equity, winsorized at the 1st and 99th percentile. *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. *Size* is the book value of total assets scaled by 100,000. *Pre 1-year return* 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. *Pre 20-days return* is the daily cumulative market adjusted return for the period of 22 days prior and 2 days prior to the repurchase announcement. *Ownership concentration* is the percentage 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. *Dividend* is the ratio of total cash dividends scaled by net income in the year prior to the repurchase announcement. *Initial* is a dummy variable that takes the value of 1 if it is the initial announcement made by each firm and zero otherwise. *Treasury shares* is a dummy variable that takes the value of one when an announcement of intention to repurchase took place after Dec. 1st, 2003 when repurchased shares were allowed to be keep as treasury shares in the UK.. *EU Directive* is a dummy variable that takes the value of one following the date of implementation in each of the three countries. *AIM* (*Neuer Markt*) is a dummy variable that takes the value of one for firms listed on the London Alternative Investment Market (German Neuer Markt) and zero otherwise. *Tax differential* is the ratio of effective tax paid on dividends relative to capital gains tax as in Alzahrani and Lasfer (2012). *Regulatory quality* and *Rule of law* are indices measuring the quality of support to shareholders obtained from the *International Country Risk Guide*.

		CAR $_{(-1,+1)}$	Leverage	MB	Cash	Size	Pre-announcement returns		Ownership concent.	Dividend	Initial announc.	Treasury shares	EU Directive	AIM	Neuer Markt	Tax differential	Regulatory quality	Rule of law
							1-year	20-days										
All countries	Obs.	970	933	928	900	933	970	970	861	884	970	970	970	970	970	970	970	970
	Mean	0.017	0.214	2.941	0.116	383	-0.032	-0.002	26.243	2.453	0.636	0.241	0.246	0.027	0.067	1.076	0.944	0.889
	St. Dev.	0.059	0.176	3.806	0.134	1,490	0.413	0.055	24.220	2.330	0.481	0.428	0.431	0.162	0.250	0.195	0.094	0.087
	Min	-0.329	0.000	0.090	-1.649	0	-2.330	-0.343	0.000	0.000	0	0	0	0	0	0.800	0.636	0.750
	Max	0.386	0.928	26.274	0.640	15,000	1.864	0.099	88.182	29.583	1	1	1	1	1	1.458	1.000	1.000
UK	Obs.	513	482	486	476	482	513	513	498	454	513	513	513	513	513	513	513	514
	Mean	0.019	0.230	3.144	0.114	323	-0.006	0.002	15.295	3.043	0.589	0.456	0.228	0.051	0	1.253	0.975	0.962
	St. Dev.	0.056	0.185	4.474	0.129	1,300	0.329	0.050	17.605	2.684	0.493	0.499	0.420	0.220	0	0.060	0.041	0.042
	Min	-0.275	0.000	0.090	-1.148	0	-1.676	-0.257	0.000	0.000	0	0	0	0	0	1.153	0.864	0.917
	Max	0.386	0.928	26.274	0.640	14,000	1.022	0.098	71.809	29.583	1	1	1	1	0	1.458	1.000	1.000

France	Obs.	263	258	257	240	258	263	263	229	254	263	263	263	263	263	263	263	263
	Mean	0.008	0.236	2.539	0.118	416	-0.028	-0.005	42.436	1.887	0.700	0	0.217	0	0	0.879	0.890	0.809
	St. Dev.	0.049	0.161	2.678	0.105	1,600	0.385	0.048	24.649	1.617	0.459	0	0.413	0	0	0.050	0.131	0.038
	Min	-0.180	0.000	0.450	-0.516	0	-1.631	-0.206	0.061	0.000	0	0	0	0	0	0.800	0.636	0.750
	Max	0.193	0.800	26.274	0.485	15,000	1.350	0.098	88.182	11.657	1	0	1	0	0	0.964	1.000	0.917
Germany	Obs.	194	193	184	184	193	194	194	134	176	194	194	194	194	194	194	194	194
	Mean	0.023	0.147	2.968	0.120	491	-0.107	-0.011	39.255	1.748	0.675	0	0.335	0	0.335	0.875	0.933	0.805
	St. Dev.	0.074	0.154	3.148	0.175	1,770	0.599	0.072	22.858	1.760	0.469	0	0.473	0	0.473	0.048	0.103	0.036
	Min	-0.329	0.000	0.200	-1.649	0	-2.330	-0.343	0.004	0.000	0	0	0	0	0	0.800	0.727	0.750
	Max	0.345	0.758	20.230	0.505	12,000	1.864	0.099	86.073	6.897	1	0	1	0	1	0.964	1.000	0.833

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