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Market Timing, Governance and Regulation

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Abstract

Outside the U.S. short-term and long term excess returns around share repurchase announcements are positive. Long term (as well as short term) abnormal returns are positively related to an undervaluation index (Peyer and Vermaelen, 2009, RFS) which suggests that managers are able to time the market when markets overreact to bad news. While short term and long term excess returns are positively related to country governance quality, company-specific measures of governance quality tell a different story. While we find some evidence that firm-level governance quality is positively related to short-term and long-run excess returns outside the U.S., this relation vanishes among U.S. buybacks. This is consistent with the hypothesis that U.S. abnormal returns are at least partially driven by a reduction in agency costs of free cash flow. Finally, in countries where buybacks have to be approved by shareholders, short-term and long-term excess returns are smaller. However these also tend to be the countries with lower governance quality.

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Abstract

Outside the U.S. short-term and long term excess returns around share repurchase announcements are positive. Long term (as well as short term) abnormal returns are positively related to an undervaluation index (Peyer and Vermaelen, 2009, RFS) which suggests that managers are able to time the market when markets overreact to bad news. While short term and long term excess returns are positively related to country governance quality, company-specific measures of governance quality tell a different story. While we find some evidence that firm-level governance quality is positively related to short-term and long-run excess returns outside the U.S., this relation vanishes among U.S. buybacks. This is consistent with the hypothesis that U.S. abnormal returns are at least partially driven by a reduction in agency costs of free cash flow. Finally, in countries where buybacks have to be approved by shareholders, short-term and long-term excess returns are smaller. However these also tend to be the countries with lower governance quality.

1. Introduction

During the last decade share repurchases have become increasingly common around the world. Regulation introduced in the 1990s has drastically changed a firm's ability to repurchase its own shares in many countries outside the United States. As a result, it is possible to ask whether the findings based on U.S. data hold up in an international setting, and whether examining non-U.S. data can change the way we think about buybacks. Past research shows that in the U.S. open market share repurchase announcements are accompanied by positive announcement returns of about 3% and long-run abnormal returns in the order of 30% over three to four years (e.g. Ikenberry, Lakonishok and Vermaelen (1995), Peyer and Vermaelen (2009)). These results are consistent with a variety of non-mutually exclusive explanations, which can be grouped under two broad hypotheses: *undervaluation* and *agency cost* (e.g. Vermaelen (1981), Ikenberry et al. (1995), Grullon and Michaely (2004)). [1] The undervaluation hypothesis posits that firms buy back their stocks when they are temporarily undervalued. Stock prices increase after buybacks when the market corrects the undervaluation, at least in the long run. The agency cost hypothesis argues that buybacks, by returning cash to the shareholders, mitigate the agency costs of free cash flow. In this case stock prices increase because the market is relieved that bad managers don't waste excess cash. Note that this hypothesis assumes that board members and other large investors put enough pressure on these managers to pay out excess cash.

The interesting question is whether these findings and interpretations can be generalized in an international setting. In particular, the long term excess returns documented after buybacks are anomalous. As Fama (1998) points out, one way to test whether an anomaly is real or the sample-specific result of chance is to examine an entirely different data set. To take this question to the data, we investigate buyback announcements using a global sample of 17,487 announcements from 32 countries between 1998 and 2008. Our global approach also provides a unique laboratory to test for the relevance of the agency cost vis-à-vis the undervaluation hypothesis, by looking at corporate governance. Corporate governance practices and quality vary much more across an international sample than within the U.S. (e.g., La Porta et al. (2000)). The effect of governance quality on returns after buyback announcements is controversial. If firms buy back shares to increase shareholder value by reducing agency costs of free cash flow, we expect a negative relation between corporate governance quality and excess returns. Indeed, firms with low corporate governance quality should benefit more from the reduction in agency costs of free cash flow. The undervaluation hypothesis would argue

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[1] Corporate tax savings have also been identified as a driver of share buybacks.

the opposite: firms buy back stock when the shares are undervalued, but they are more likely to do so if they care about shareholder value, i.e. when their corporate governance quality is high. Thus under the undervaluation hypothesis, the better corporate governance, the higher excess returns. Note that not all repurchases are driven by shareholder value. Examples include fighting a takeover bid by repurchasing shares from "pessimistic" shareholders, stabilizing the stock price by buying shares above "fair" value, manipulating earnings per share (Chan, Ikenberry, and Lee (2007), Cheng, Harford and Zhang (2014)), or acting in the interest of a majority stockholder at the expense of minority shareholders. The latter argument is particularly important in many European firms, where only a minority of the publicly traded firms are widely held (Faccio and Lang (2002)

In addition, our sample also allows us to test for the relevance of country-specific regulation. In our sample period, 1998-2008, all sample countries allow share repurchases. Concerns of possible market manipulation led in many countries before the late 1990s to regulation that effectively prohibited buybacks, except in very special circumstances, or exposed firms to possible legal actions if they traded in their own shares. In the U.S., no such restriction applies, since the SEC ruling in 1982 that share buybacks fall under the safe harbor Rule 10b-18.[2] Since at least about 1998, most countries in our sample introduced similar regulation.[3] However, regulatory differences persist, in particular with respect to who has the power to authorize a buyback. In Australia, Canada, India, Israel, New Zealand, Switzerland, Taiwan, and Thailand, as well as in the U.S., the management only has to ask the authorization of the board of directors. In all other countries, however, shareholder approval is required. One plausible purpose of requiring shareholder approval is to protect shareholders against buybacks driven by non-value maximizing reasons.[4] If the regulation is effective, buybacks in shareholder approval countries will generate larger excess returns than in board approval countries, ceteris paribus. On the other hand, requiring shareholders to approve the buyback may diminish the information content of buyback announcements. As it is costly to set up a shareholder meeting only for an approval of a repurchase program, managers will routinely ask for a buyback authorization at shareholders meetings (typically for a period of 18 months). Hence, announcement returns may be lower in shareholder approval

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[2] For details see e.g., Cook, Krigman, and Leach (2003).
[3] The UK allowed buybacks in 1981, Hong Kong in 1991, Switzerland in 1992, Japan 1994. France and Germany made the condition less restrictive in 1998. In the Netherlands a tax law revision in 2001 lowered the cost of a buyback. An overview of open market buyback regulation in ten countries is given in Kim, Schremper, and Varaiya (2005).
[4] For instance, in the E.U., in addition to the individual states' corporate law, share buybacks are currently also regulated under the Market Abuse Directive (2003/6/EC)

countries if the announcement simply reflects such a routine request. To the extent that the firm has to wait for shareholder authorization when it is undervalued, it will reduce the value of the option to repurchase shares when they are undervalued, so that short term and long term post-repurchase excess returns may be smaller. Whether shareholders should have more power than boards has been the topic of an intense debate (see e.g. Bebchuk and Weisbach (2009) for an overview). Although there is evidence that boards don't serve long term shareholders (e.g. Bebchuk (2013)) in the case of buyback authorizations giving shareholders decision power may be counterproductive if it reduces the flexibility of management to take advantage of undervaluation.

Around the announcement date, we find that the 7,394 non-U.S. buybacks generate a significant positive average abnormal return. However, the magnitude of the announcement returns is only about half of that in the U.S. (1.27% versus 2.16%). We first test whether the differences in announcement returns are associated with better governance, and find that announcement returns are positively associated with governance quality, at least at the country level (based on the La Porta et al. (1998) legal origin, the Governance Rating of GovernanceMetrics International®, and the Loderer et al. (2010) index). However, at the company level (based on the ISS Corporate Governance Quotient) this positive relation only is significant in the non-U.S. sample. One interpretation of this is that in a high quality governance country as the U.S., buybacks are typically driven by good (shareholder value maximizing) reasons. In non-U.S. countries this is not always the case and therefore investors pay attention to company-specific governance quality when assessing whether the repurchase is good for shareholders.

Next, we test whether regulatory differences affect the market reaction to buybacks. We find significantly higher average short-term announcement returns in countries where board approval is sufficient, a result consistent with the undervaluation hypothesis: board approval allows a more timely response to undervaluation, and the announcements are not routine requests to extend a buyback authorization. However, we also find that board approval countries typically have higher quality governance. Hence the result may simply mean that what matters for shareholders is governance quality. The "shareholder protection" provided by shareholder approval regulation is not effective.

In the second part of our study, we examine the long-run returns following share buyback announcements, allowing for markets to underreact to the buyback announcement. Note that such under-reaction is necessary if the company wants to time the market to buy undervalued stock. Similar to the U.S.,

open market buybacks globally generate significant, positive long term excess returns. Using the calendar-time long term event study methodology (Fama (1998)) and one-, three- and four-factor models we find significant positive alphas over all post-repurchase horizons (12 to 48 months). Moreover, the non-U.S. monthly alphas are larger than the corresponding U.S. ones.

Long term excess returns are an anomaly. One explanation for the excess returns could be that we have underestimated risk as repurchasing firms increase their leverage, thus increasing systematic risk. To the extent that benchmark models such as the calendar-time portfolio approach do not allow for the factor loadings to change through time, the observed outperformance could simply be due to higher risk. To guard against this possibility, we re-estimate abnormal returns with Ibbotson's (1975) RATS method, which adjusts for risk changes in event time. We find cumulative abnormal returns between 25% and 44% over 48 months. Hence, the excess returns cannot be explained by an increase in risk. The remainder of the paper examines to what extent these long-term returns can be explained by the undervaluation hypothesis or the agency cost hypothesis.

The undervaluation hypothesis predicts that firms are more likely to buy back shares because they are undervalued. Peyer and Vermaelen (2009) argue that these companies can time the market because investors overreact to bad news, and this overreaction is more plausible when a buyback is made by a small beaten up value stock. Consistent with the U.S. evidence, in our global sample we find a positive relationship between long-run returns and a proxy for undervaluation, the Peyer and Vermaelen (2009) U-index. Cumulative abnormal return differences between high and low U-index firms range from 13% to 17% over 48 months. As in the U.S., prior to the buyback announcement, analysts lower EPS forecasts of high U-index firms, consistent with the hypothesis that the buyback is triggered by disagreements between management and analysts. Moreover, firms with low analyst coverage tend to outperform firms with high analyst coverage, suggesting that firms where the likelihood of misvaluation is larger experience the larger excess returns.

We explore a number of possible other reasons, besides overreaction, why managers may believe the stock is undervalued. One reason could be that the market underestimates the likelihood of a takeover. For instance, management may have initiated the repurchase to be in a better negotiation position with a potential bidder. Bargeron, Bonaime and Thomas (2012) argue that firms that are not subsequently taken over experience no long run abnormal returns after U.S. open market buyback announcements. However, outside of the U.S., we find little difference in terms of long-run returns between buyback firms that are takeover targets and non-

targets. Moreover, although U.S. takeover targets earn higher excess returns than non-targets, non-targets (which represent more than 80 % of our sample) still earn significant long term excess returns.

An alternative reason for undervaluation could be that according to the management markets may overestimate risk (Grullon and Michaely (2004)). Specifically, the buyback signals that the firms experience a drop in systematic risk as they become more mature businesses. In our global dataset (including U.S. and non-U.S. firms), we do not find significant reductions in systematic risk, measured using one, three, and four factor models.. Thus, the data suggest that unanticipated changes in risk are not the main reason for positive long-run abnormal returns in our global dataset.

We found that short run returns are positively related to country governance quality. This result is confirmed in the long run: using country level governance proxies, we find that long-run abnormal returns are higher in countries with better governance. However, as with short terms returns, when using proxies for *company*-specific governance, we find a significant difference between U.S. firms and non-U.S. firms: in the U.S. long term excess returns are negatively related to corporate governance quality. This is consistent with the hypothesis that benefits from the reduction in agency costs of free cash flow explain at least part of the long term returns of U.S. firms.

We also found that short term returns are lower when shareholders have to approve the buyback. To the extent the market underestimates the relevance of regulation, we would expect to see a similar effect in long term returns. First, waiting for the next shareholder meeting to get approval (in case the firm does not have an authorization) will diminish the ability of managers to take advantage of an undervalued share price. Second, buybacks are often criticized as a form of legal insider trading allowing informed long term investors (which includes the management) to take advantage of uninformed selling shareholders. It is unlikely that a shareholder meeting would approve a buyback if this was the main motivation behind the repurchase. As board members represent major long term shareholders they would be much more open to this market timing motivation. Consistent with this hypothesis, we find evidence that buybacks in board approval countries are followed by higher long term excess returns than in shareholder approval countries. However, as we find that governance quality is also higher in board approval countries, this result may also be due to the fact that governance quality dominates regulation as a source of shareholder protection against unjustified buybacks. In other words, having shareholders approve buybacks does not compensate for poor governance quality.

In summary, we can say that both correction of undervaluation and reductions in agency costs of free cash flow explain the long run returns after buybacks in the U.S. For the non-U.S. countries, however, the results cannot be explained by agency cost reductions, as we find a positive relation between governance quality and short term and long term excess returns. One interpretation of this difference is that, unlike in the U.S., in non-U.S. countries a significant number of firms buy back stock for reasons not motivated by shareholder value maximization. Hence, when governance quality is high it is more likely that these buybacks are driven by shareholder-friendly reasons. Moreover, as the Undervaluation Index predicts long run returns in both the U.S. and non-U.S. samples, we can confirm that market timing is prevalent around the world: i.e. small, beaten up value firms are able to take advantage of an undervalued stock price, possibly because the market has overreacted to bad news.

Why does such an anomaly persist? It should be pointed out that the percentage of listed firms that announce buybacks is relatively small (between 0.5% in Israel and 6.5% in Japan). The problem with learning in this setting is that the excess returns are realized over a long time period, which makes it difficult for investors to attribute the excess returns to the buyback rather than to other company specific events. In addition, the stocks with the highest post-announcement returns are firms that experienced analyst downgrades and negative pre-announcement returns. Hence, buying shares after a buyback announcement means going against the opinion of analysts and momentum traders.

The remainder of the paper is organized as follows. In section 2 we describe our data. Section 3 describes the methodology and results of our analysis of short term announcement returns. Section 4 discusses our methodology and results on long-run returns. Section 5 concludes.

2. Data

We collect a sample of open-market share repurchase announcements from the SDC Mergers and Acquisitions and Repurchase databases. For announcing firms which are listed outside of the U.S. we use Datastream and Worldscope as data sources for stock price and accounting information. For U.S. firms we use CRSP and Compustat. We restrict the sample to announcement dates in the period between 1998 and 2008. In 1998, most countries in our sample have made buybacks legal and reduced tax and other obstacles preventing firms from buying back their own shares. We focus on open-market share repurchases, as this is the most

common form of repurchases worldwide.[5] We restrict the sample to announcements where the percentage of shares sought for the buyback is less than 50%, in order to exclude going private transactions. We focus on the 31 non-U.S. nations with at least 25 buyback announcements reported in SDC in the sample period. We further require that stock return data are available from Datastream for each of our sample firms.[6] This results in a buyback sample of 7,394 announcements from the 31 non-U.S. countries, plus 10,093 announcements from U.S. firms.

Table 1 reports a breakdown of the sample by repurchasing firm country. The country with the largest number of announcements outside the U.S. is Japan (2,644), the one with the smallest number in our sample is Singapore (19). On average, firms outside the U.S. seek to buy back 7.4% of their outstanding shares, while U.S. firms seek 9.3%. Country averages vary between 4.8% (Taiwan) and 12.7% (India). These average figures mask considerable variation among individual repurchase announcements, with the percentage of shares sought being as low as 0.1% and as high as 50%.

One potential difference across countries could be the extent to which firms use the option to announce a buyback, but do not complete it. For instance, the market reaction to buyback announcements could be smaller, to the extent that shareholders do not expect the firm to exercise the option to repurchase. Table 2 reports completion rates across the different countries. Completion rates are defined as the percentage of the announced buyback that is actually completed (for details of the variable definition, please see the Appendix, section A). Outside the U.S., we find that the average completion rate after 1 (2) year(s) is 59% (71%). For U.S. firms, we find 75% and 85%, respectively. So it seems that completion rates outside the U.S. are lower. This may be a consequence of the fact that some buyback announcements are automatic requests to extend buyback authorizations at the shareholder's meeting. There are also large differences across countries. Sweden and Japan have the lowest completion rates after 1 year, with only 22% and 23%, respectively. China and Israel have the highest with 86% completed after 1 year.

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[5] Over the sample period, SDC reports only 635 non-open market repurchase announcement outside of the U.S. and Canada, of which 606 are privately negotiated repurchases, 24 are tender offers, and 5 take the form of Dutch auction.

[6] For a number of announcements from the SDC Mergers and Acquisitions database, the Datastream code identifying the announcing firm in Datastream is reported by SDC. For the remaining firms, we manually look for the corresponding record, if available, in Datastream. Appendix C reports that the matching does not reduce the sample size of buybacks from SDC significantly. However, note that SDC and Datastream do not cover all firms outside the U.S. Both data providers apply size restrictions, concerning both the firms' market capitalization (Datastream) and the buyback program size (SDC). Thus, our sample size might be smaller than that of prior literature collecting information based on local news and stock exchange information.

As illustrated by Figure 1, there is also considerable variation in the number of repurchase announcements over time, as well as across countries with different legal origin (La Porta et al. (1998)). Following La Porta et al. (1998), we consider four distinct legal origins: English common law, and French, German, and Scandinavian civil law. A large fraction of the repurchase announcements outside the U.S. (44%) are from firms from a German civil law country – mostly driven by Japan; 43% are from English common law countries; 10% from French civil law countries; and 3% from Scandinavian civil law countries. Our sample includes years with relatively few repurchase announcements – 1998 with 452 announcements, or 2005 with 464 – as well as two "peak" years – 2003 with 1,120 announcements, and 2008, with 1,282.

3. Announcement returns

We start with an analysis of short term stock market reactions to buyback announcements. Our main questions are: First, whether shareholders view a buyback announcement as positive news, consistent with U.S. evidence. Second, whether the announcement returns are related to the quality of corporate governance and differences in regulation, and if so, in a way that is consistent with the undervaluation or agency cost hypothesis.

3.1 Methodology

We estimate cumulative abnormal returns for 3-day (-1,+1), 5-day (-2,+2), and 7-day (-3,+3) intervals around the announcement date. On a given day, the abnormal return is estimated as a market-adjusted return, i.e., as the difference between the actual stock return and the expected stock return, assumed equal to the market return.[7] The cumulative abnormal return (CAR) is simply the sum of the abnormal returns on each day of a given interval.

We also resort to a bootstrap procedure to compare announcement returns in a given country with the announcement returns to be expected from a similar-sized sample of U.S. buybacks. For each nation in our sample having *n* announcements, we randomly select a sample of *n* U.S. open-market repurchase

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[7] In unreported results, we also estimated the abnormal returns as the difference between the stock return and the predicted stock return from a market model. The results are qualitatively similar to the ones reported. Additionally, we also repeated the exercise estimating the parameters of the market model using the Scholes and Williams (1977) procedure to correct for thin trading, obtaining, again, qualitatively similar results.

announcements, and compute the average U.S. announcement returns.[8] We repeat this procedure 1,000 times, each time drawing a fresh sample of U.S. announcements. We then compare the non-U.S. average cumulative abnormal return to the distribution of bootstrapped U.S. average cumulative abnormal return, to evaluate if any differences are significant.

3.2 Results

Table 3 shows that the average abnormal announcement return of the overall sample of buybacks outside the U.S. is 1.27% over the three-day (-1,+1) window, 1.38 % over the five-day (-2,+2) window and 1.48% over the seven-day (-3,+3) window. These averages are significantly positive. However, the average abnormal returns over the three different windows are all significantly lower (with bootstrap p-values of 0.00) than for the average U.S. firm with a CAR of 2.18% (2.13%, 2.02%). There are 16 countries with significantly positive CAR (-1,+1) and 9 with a CAR (-1,+1) higher than the U.S., with China and Germany displaying significantly higher CARs (-1,+1) than the U.S. announcement returns. We find one country (Indonesia) with a marginally significant negative CAR (-1,+1). Over any other window, no significantly negative CAR is recorded.

Figure 2 shows the cumulative abnormal returns for the U.S. buyback firms versus the non-U.S. buyback firms over the -30 to +30 days around the announcement date. For the non-U.S. sample we show separate graphs for board approval and shareholder approval countries (panel B). Pre-announcement returns are less negative outside the U.S. and announcement returns are smaller. The smallest (in absolute terms) pre-announcement and announcement returns are observed in the shareholder approval countries, which is consistent with the hypothesis that these announcements are more likely to be routine requests to buy back stock, not managerial responses to mispricing – we discuss this issue in greater detail below.

3.3.1. Country level analysis

In Table 4 we test to what extent differences in the quality of governance at the country level can explain country-average cross-sectional differences. The undervaluation hypothesis predicts that where

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[8] The sample of U.S. repurchase announcements used in the bootstrap procedure is collected from the SDC Mergers and Acquisitions and Repurchases databases, with the same criteria as the sample of international share repurchase announcements. In other words, the attention is restricted to open-market announcements by firms with complete return data from the CRSP data set, taking place over the period 1998-2008. We also repeat the bootstrap procedure using a sample of U.S. open-market repurchase announcements from the period 1991-2001 (this is the same period covered by Peyer and Vermaelen (2009)). The results are similar to the ones reported here, and are thus omitted in the interest of brevity.

managers and shareholders' interests are more aligned (i.e. high governance quality countries) abnormal announcement returns will be higher. The agency cost hypothesis predicts that announcement returns are higher in worse governed counties, because in these countries a share repurchase to reduce excess cash is a more positive surprise.

In Panel A of Table 4 we show average CAR (-1,+1) for firms in the four different legal origins. Results are qualitatively similar whether we include or exclude the U.S. buybacks from the sample. Including the U.S., we find average CARs of 2.05% in English common law countries, while Scandinavian (1.40%), German (1.08%), and French (0.37%) civil law are all lower. The French law average is even insignificantly different from zero. To the extent that French civil law countries also have the lowest governance ratings (e.g., La Porta et al. (1998)), these findings suggest that better governance is associated with higher abnormal announcement returns.

To test this hypothesis further, we run country-level cross-sectional regressions. In Panel B of Table 4, we show regressions using various proxies for governance quality at the country level. In each regression we include a number of control variables: country-level average completion rates, the fraction of shares sought at the time of the announcement, the percentage of publicly listed firms announcing a share buyback, ln(GDP) and stock market characteristics such as stock market size and turnover.[9] Regressions (1)-(4) exclude the U.S., (5)-(8) include the U.S. The results are qualitatively similar, suggesting that the U.S. is not solely driving the findings. Focusing on results that exclude the U.S., consistent with the univariate statistics in Panel A, we find that the average announcement returns are significantly lower in French civil law countries compared to the English legal origin countries. Using the GovernanceMetrics International® Index (GMI) or Loderer et al. (2010) index, we also find a positive association between governance quality and average announcement return. The GMI index varies from zero to ten. Thus, a unit increase of the GMI increases the country-average CAR (-1,+1) by 0.43%. Compared to the average CAR of about 1.27%, this seems economically sizable. A GMI difference of about 1 exists between the U.K. (7.36) and New Zealand (6.42), while the difference between the U.K. and the U.S. (7.18) is about 0.20. Similarly, using the Loderer et al. (2010) index we find a positive association with announcement returns. Loderer et al. (2010) assess the shareholder value maximization orientation of companies in various countries. Their index takes values between 0 and 1, determined by the

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[9] For brevity we do not show the regression coefficients but they are available upon request.

fraction of firms that have a shareholder-value orientation. For countries without the Loderer Index, we include a missing-value indicator. We find a significantly positive coefficient on the Loderer et al. (2010) Index, indicating that announcements in countries with a higher fraction of shareholder oriented firms are more positively affecting the share price. A ten percentage point higher fraction of shareholder oriented firms corresponds to a 0.53% higher country-average announcement return. Both findings suggest that the stock price increases more for better governance countries and countries where firms are more likely to act in the interest of shareholders.

In column (4) we find that firms in board approval countries experience a higher average CAR than firms in shareholder approval countries. The difference in CAR is estimated to be 1.15%, significant at the 1% level. Thus, regulatory differences are associated with the shareholder reaction to the buyback announcement. The higher CAR for firms in board approval countries is consistent with the interpretation that shareholders in these countries do not expect managers to undertake a buyback for shareholder value destroying reasons. Alternatively, buyback announcements in shareholder approval countries are routine requests and therefore have very little information content. Table 5, panel A, shows a strong positive correlation (above 0.80) between board approval and the GMI and Loderer indexes. This supports the first interpretation: countries with board approval are high quality governance countries and this reassures investors that the buyback is motivated by good reasons. Note also the high positive correlation (about 0.70) between the Loderer et al (2010) index and the GMI.

These findings are consistent with the hypothesis that, on average, buybacks are good news for shareholders, possibly because investors believe that management has solid reasons to believe the shares are undervalued. Moreover, country corporate governance quality matters when assessing the benefits to shareholders of a share repurchase. The results also imply that the major explanation for the positive announcement returns is not agency cost reduction as in this case we would expect a negative relation between announcement returns and governance quality.

3.3.2 Firm level analysis

In Table 6 we report the estimates of firm-level regressions using the announcement return measured in the (-1,+1) window. Using firm level analysis allows us to control for firm level characteristics, such as size,

market-to-book,[10] prior stock return, leverage, payout ratio and the percentage of shares sought. We include both country-specific as well as firm-specific proxies for the quality of governance. The first three regressions of Table 6 show results excluding the U.S. firms, while the remaining regressions are based on U.S. firms.

Firm-specific governance is measured by the ISS Corporate Governance Quotient (CGQ). This measure of governance is available for non-U.S. companies and based on 61 characteristics, unlike the G-index developed by Gompers, Ishii and Metrick (2003) which is only available for U.S. firms and focuses on takeover defenses. Note from table 5 that the CGQ is significantly positively correlated (0.5) with the country governance rating measured by GMI. The CGQ index is only available for a subset of the repurchasing firms in our sample, covering 1,275 announcements outside the U.S. and 6,732 U.S. announcements. The CGQ index is a number between 0 and 1, corresponding to the firm's governance quality ranking, i.e., a CGQ index of 0.50 implies that 50% of all the firms in the reference index (MSCI EAFE index outside the U.S. and Canada, TSX in Canada, and S&P500 in the U.S.) have worse governance than the firm.

We find that in the non-U.S. sample the CGQ index is associated with a statistically significantly higher announcement return. So this result is consistent with the country-level results of table 4: governance is positively related to returns. However, this result does not hold in the U.S.: in regression (6) the regression coefficient is not significantly different from zero and even has a negative sign. One interpretation is that investors in foreign countries, unlike the U.S., depend on the quality of governance to assess whether a buyback is made for good reasons. The results are clearly not consistent with the hypothesis that agency costs reductions are the main driving force of announcement returns outside the U.S., as in this case we would expect a negative relation.

We find a significant negative association between the prior-return and CAR. This is consistent with the hypothesis that managers respond to undervaluation by buying back stock. Size is also significantly negatively related to CAR, consistent with the interpretation that smaller firms are more likely to be mispriced and the market adjusts the stock price more in response to the buyback signal. Surprisingly, unlike in the U.S., the book-to-market ratio of firms outside the U.S. is mostly insignificantly related to CAR. We combine the information on prior return, size, and book-to-market ratio in one "undervaluation index" or U-index, in the

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[10] Grullon and Michaely (2004) find that cash multiplied with the market-to-book ratio when the ratio is smaller than 1 is positively related to announcement return. When we included this variable in our regressions we find also a positive coefficient but it is never statistically significant.

spirit of Peyer and Vermaelen (2009). The index ranges from 3 to 9 based on the buyback firm's rank of prior return, size, and book-to-market.[11] In regressions (2), (3), (5) and (6) we test whether the U-index is related to the announcement returns, with and without control for country specific governance quality. Consistent with Peyer and Vermaelen (2009)), the U-index is positively related to CAR. An increase in the rank by 1 is associated with an increase in CAR by approximately 0.12% excluding the U.S. firms, and 1.20% in the sample of U.S. firms. Note that the effect is 10 times stronger in the U.S. than in non-U.S. countries.

If the announcement return was mainly driven by reductions in agency costs of free cash flow (or corporate tax savings), we expect a negative association between leverage and CAR to the extent that agency costs are less important when leverage is high. We find such a significant relation in the U.S. but not elsewhere, again suggesting that returns outside the U.S. cannot be explained by reductions in agency costs. Although not directly related to our working hypotheses, some other differences between the U.S. and other countries are noteworthy. First, buybacks made by firms with higher payout ratios generate smaller returns outside the U.S. One interpretation of this result is that, when a foreign company has a high payout ratio, a buyback is considered as a decision to substitute dividends for share buybacks. In other words, the buyback implies a decrease in future expected dividends, a potentially negative signal. No such substitution is expected in the U.S. Note that the negative sign is also inconsistent with a personal tax saving hypothesis, i.e., that because dividends are generally taxed higher than capital gains, investors will pay more for low dividend paying stocks. Second, the percentage sought is positively related to announcement returns, but only significantly in the U.S. sample. One explanation is that in many foreign countries the percentage sought is capped at 10% so that firms automatically ask permission to buy back 10% of the shares, especially in countries where shareholder approval is required.[12] Hence there is very little information content in the percentage of shares sought in foreign buybacks.

In sum, our analysis of the short term market reaction to global buyback announcements suggests that buybacks are mostly perceived to be value increasing – although less so outside the U.S. Buyback announcements increase share prices more in countries with better governance, in countries where more firms

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[11] Firms are classified into terciles based upon their 6-months prior return, size, and book-to-market ratio at the time of the buyback announcement relative to all firms in the country of the buyback firm. Firms with the worst prior return (lowest tercile), the smallest firms (lowest tercile) and firms with the highest book-to-market ratio (highest tercile) get three points for each criteria (for a total U-index score of nine).

[12] We find (results available upon request) a large clustering of target fractions of 5% and 10% in foreign countries, while the target fractions of U.S. buybacks are more uniformly distributed and not capped at 10%.

state that they maximize shareholder value, in countries where the board can approve buybacks, when the buyback is not perceived as a substitute for paying dividends, and when the company is a beaten up small value stock. However, when focusing on company measures of governance quality, the foreign sample and the U.S. sample results diverge: U.S. investors do not seem to be very much concerned about governance quality, while in foreign countries the market seems only to trust the management of high quality governance firms.

3.3.3 Inferences

Our findings in the non-U.S. sample complement the analysis of Ellis, Moeller, Schlingemann, and Stulz (2011) who find that the quality of corporate governance is positively related to bidder returns around acquisition announcements. They interpret their findings as being consistent with the hypothesis that better governance has a positive effect on firm investment quality – or at least the extent to which any gains from investment accrue to the shareholders. To the extent that a buyback is also an investment decision, our findings are consistent with the conclusions of Ellis et al. (2011). Note that, as in the case of acquisitions, share buybacks can be driven by non-value maximizing incentives. However, this conclusion does not hold for U.S. firms: apparently investors believe that U.S. managers tend to buy back stock for reasons that increase shareholder value. Alternatively, they believe that high quality governance implies lower savings from reduction in agency costs of free cash flow so that there is no obvious relation between announcement returns and governance quality. Or, perhaps the market underreacts to corporate governance quality, an argument also made by Gompers, Ishii and Metrick (2003). In order to test for these alternative explanations we need to examine long term returns.

4. Long-run returns

In this section we first test whether firms outside the U.S. exhibit similar positive abnormal return patterns after buyback announcements as documented in Ikenberry, Lakonishok, and Vermaelen (1995), and Peyer and Vermaelen (2009). We then test whether these abnormal returns can be explained by the fact that the stock was undervalued at the time of the buyback. We test for three different interpretations of undervaluation: first, the overreaction hypothesis proposed by Peyer and Vermaelen (2009) who argue that firms buy back stock because investors and analysts have overreacted to bad news such as an earnings miss; second, the market underestimates the likelihood of a takeover bid; finally, the market overestimates the risk of the cash flows. To

test for the relevance of agency costs, we test whether long term returns are correlated with governance quality. Finally, we examine the impact of regulation.

4.1 Methodology

Our sample spans 32 countries as listed in Table 1. In order to test whether shares of companies that have announced a buyback outperform similarly as in the U.S. (e.g., Ikenberry et al. (1995), Peyer and Vermaelen (2009)), we estimate long-run returns using the calendar-time (Fama (1998)) and Ibbotson (1975) RATS methods. We could estimate the long-run returns in U.S. dollar or local currency terms – we take the perspective of a U.S. investor and use U.S. dollar returns.[13] Fama and French (2012) present 'global' and 'regional' factor models, for regions Asia-Pacific Ex-Japan, Europe, Japan, and North America. In addition, we could resort to country-specific factor models. Fama and French (2012) argue that factor models applying to multiple countries are only adequate to the extent that there is reasonable integration across the different markets, and Griffin (2002) finds that global factor models can result in large pricing errors. This suggests that the global factor model might be inappropriate for our test. On the other hand, country-specific factor models should be based, for many countries in our sample, on factors constructed from a small number of stocks, and could thus lead to less precise estimates. The regional factor model thus seems a good compromise between these two extremes, and we base most of our results on the Fama and French (2012) regional factors, obtained from Ken French's website.[14,15]

4.1.2. Estimating long-run abnormal returns

We estimate long-run abnormal returns following the stock repurchase announcement using two complementary methodologies: Fama's (1998) calendar-time portfolio approach and Ibbotson's (1975) Returns Across Time and Securities (RATS) method.[16]

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[13] Results are qualitatively similar if we use local currency returns (omitted for brevity).

[14] Hou, Karolyi, and Kho (2011) conclude that separate local and foreign factors lead to lower pricing errors, especially when using their new factor, the cash flow-to-price ratio. We restrict our analysis to the standard Fama-French factors, to facilitate comparability between our results and existing studies based on U.S. data. In an earlier version of the paper, we also ran tests based on country factor models, obtaining similar results (omitted for brevity).

[15] The Fama and French (2012) regions do not span the entire set of countries used in our study. Therefore, we assign our sample countries to Fama-French regions based on geographic proximity and economic linkages: Brazil and Mexico are assigned to the America Ex-U.S. region, Israel to Europe, and China, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand to Asia-Pacific Ex-Japan.

[16] An additional issue involved in estimating the long-run abnormal returns following the buyback announcement is that of the quality of non-U.S. stock return data. A number of studies (e.g. Ince and Porter, 2006, Baker and Wurgler, 2010, Karoliy et al., 2009) have pointed out that this is, in general, not comparable to the quality of CRSP data. In order to ensure that the stock return data used in our study are

In the calendar-time portfolio approach a portfolio of repurchasing firms is formed as follows. Each calendar month, an equally-weighted portfolio is formed, including all the firms that made a repurchase announcement in the previous 12 months (24, 36, 48 months depending on the horizon being considered). The composition of the portfolio thus changes each month. The average monthly abnormal return of the portfolio is then estimated, as the intercept from:

$$R_t - R_{ft} = \alpha + \beta_1(R_{mt} - R_{ft}) + \varepsilon_t \tag{1}$$

where R_t denotes the portfolio return in month t, R_{mt} is the stock market return, and R_{ft} is the monthly risk-free rate of return. Equation (1) above refers to a one-factor model. Analogous regressions are estimated for the three- and four-factor models.

Just as in the case of the announcement effects, we resort to a bootstrap procedure comparing our non-U.S. buyback sample to a similar-sized U.S. one. For each nation having n announcements, we randomly select a sample of n U.S. repurchase announcements, and run the calendar-time portfolio method on this sample. We repeat this procedure 1,000 times, each time drawing a fresh sample of U.S. announcements. We then compare the non-U.S. calendar-time portfolio returns to the distribution of bootstrapped U.S. calendar-time portfolio returns, to evaluate if any differences are significant.

The second methodology used to estimate the long-run abnormal returns following the repurchase announcement is the Ibbotson (1975) RATS methodology. The Ibbotson (1975) RATS methodology involves running a number of cross-sectional regressions over the sample of repurchasing firms, each regression corresponding to a given month after the announcement date:

$$R_{in\tau} - R_{f\tau} = \alpha_\tau + \beta_\tau(R_{mn\tau} - R_{f\tau}) + \varepsilon_{in\tau}, \ \tau = 1, \dots, 48 \tag{2}$$

where i denotes a given firm, n a given nation, and τ a given month following the announcement date. Analogous regressions are estimated for the three- and four-factor models.

The advantage of this methodology is that changes in the riskiness of the equity from before to after the repurchase, for example due to changes in leverage, are better accounted for. The reason is that month by month, after the repurchase announcement, the factor loadings are allowed to change (although only in the cross-sectional average, not for each repurchasing firm individually). An additional advantage of the Ibbotson (1975) RATS methodology is that it allows to explicitly control for correlation patterns in the data, by adjusting

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not affected by coding errors, stale prices, etc., we apply a number of filters used by Ince and Porter (2006). These filters are described in detail in the Appendix.

the standard errors. In short, the 48 equations in (2) are jointly estimated as a system of Seemingly Unrelated Regressions (SUR), with standard errors clustered around nation (Petersen, 2009). We can then test the significance of the cumulative abnormal returns as a simple test on a linear combination of the α_τ coefficients of the SUR model.[17] A final benefit of the RATS approach is that, unlike the calendar-time approach, it allows to pool together buyback announcements from different regions (thus with a different set of regional Fama-French factors) without having to resort to the "global" Fama-French factors.

4.2 Results

4.2.1 Long-run returns after buyback announcements: the calendar time method

Table 7 shows long-run abnormal returns following the repurchase announcements using the calendar-time methodology. Panel A shows the results with a one-factor, three-, and four-factor model for the non-U.S. and U.S. buybacks samples. Regardless of the factor model and the investment horizon, the non-U.S. alphas are always significantly positive at the 1% level and range from 0.4% to 0.7% per month. Panel B breaks down the sample into the four regions defined by Fama and French (2012), with additions of Brazil and Mexico to America, Israel to Europe and China, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan and Thailand to Asia-Pacific Ex-Japan. All regions show statistically significant (at the 5% level or less) alphas except Europe: regardless of the factor model or the investment horizon, European buybacks are never followed by significant alphas. This European exception is not due to outliers: Panel C, D, and E show excess returns for individual countries, using, respectively, the one- factor, three-factor and four-factor model. None of the European countries, except Sweden, shows significant positive excess returns using three-factor or four-factor models. Moreover, buybacks announced by Greek firms are the only buybacks in the world that are followed by significantly negative excess returns.[18] The top row of panels C, D and E in table 7 shows the long term excess returns for the U.S. buybacks. Regardless of the time horizon and factor model, alphas are always statistically significantly positive at the 5% level. However, the magnitude of the long-run returns is smaller than for non-U.S. buybacks: over the 48-month period following the buyback announcement, the alphas for non-U.S.

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[17] Peyer and Vermaelen (2009) test the significance of the cumulative abnormal returns computed with the RATS method computing the standard errors as the square root of the sum of the squares of the standard errors from the individual cross-sectional regressions. The methodology employed here collapses to the approach of Peyer and Vermaelen (2009), if regular OLS standard errors are used.

[18] This does not appear to be driven by the Greek sovereign debt crisis of 2010, as only 2 Greek buybacks are announced in 2007 and only 3 in 2008 in our sample. Nevertheless, we do not overemphasize this finding, given the relatively small number of Greek buyback announcements in the first place.

buybacks range between 0.4% (four-factor model) as 0.7% (one-factor model), compared to 0.3% (three-factor model) to 0.5% (one-factor model) for the U.S.

4.2.2 Long run returns after buyback announcements: the RATS method

As discussed above, we also compute abnormal returns using the RATS method. This method allows the loading on each factor to change month-by-month after the buyback. Table 8 uses the RATS method to replicate the results of table 7. The main difference with Table 7 is that now also European firms experience significant positive long term excess returns (panel B). Figure 3 shows the cumulative average abnormal returns for the 5 regions (U.S., Europe, North America-ex U.S., Asia-ex Japan, and Japan. Although statistically significant, Europe appears to be the region with the smallest long term excess returns. However, this time, using three (four) factor models we find statistically significant excess returns in several European countries such as the U.K., Austria, Sweden and Switzerland, although Greece remains a significant underperformer (see panels D and E). We conclude that, after adjusting for risk changes in event-time, on average, buyback stocks outside the U.S. exhibit similar abnormal return patterns as in the U.S. For the remainder of the paper we will employ the RATS method for a simple reason: we want to pool all the buybacks of different regions but at the same time allow for region-specific factor models. The calendar time method, in contrast, requires that all stock returns are driven by the same factor model.

4.2.3 Test of the undervaluation hypothesis

In this section we test for the undervaluation hypothesis: the management buys back stock because it believes the stock is undervalued. This undervaluation can be the result of investors overreacting to bad news, underestimating the likelihood of a takeover bid, or overestimating risk.

The *overreaction hypothesis* is based on Peyer and Vermaelen's (2009) finding that beaten up small value stocks (firms with a high U-index) tend to outperform after the buyback. Thus, buybacks are more likely a reaction to disagreements between the market and insiders about the value of the firm at the time of the buyback. In order to test for a possible channel by which firms might become underpriced, we test whether firms react with announcing a buyback in response to being beaten up by analysts. For our non-U.S. sample, we compute the average earnings per share forecast for the fiscal year end in each of the six months prior to the buyback announcement. Figure 4 shows how EPS forecasts change differently between the highest and lowest

tercile U-index firms. The EPS forecast drops significantly more for high U-index firms, in line with findings for the U.S. in Peyer and Vermaelen (2009). This finding is consistent with the interpretation that managers react to EPS revisions by analysts which depress the share price by announcing a buyback.

Assuming that analysts play an important role in producing information which is incorporated into the share price, we also test whether firms with fewer analysts following exhibit larger long-run abnormal returns. Table 9 show RATS abnormal returns for subsamples where the U-index is in the lowest tercile (less undervalued firms) versus the highest tercile (more undervalued firms). Regardless of the time horizon and factor-model, high U-index portfolios always outperform low U-index portfolios over 36 month and 48 month horizons and the differences are statistically significant at the 10% level or better. For example, the differences between the highest and lowest tercile U-index abnormal returns over 48 months (excluding U.S. firms and using regional factors) in panel A range from 12% (four-factor model) to 17% (one-factor model) and are all significant at the 1% level. Focusing on U.S. firms in the sample (panel B) makes the differences between high and low U-index firms even larger, ranging from 19% (three-factor model) to 22% (one-factor model). Thus, the international evidence supports the conclusions based on U.S. data. Table 9 also shows that firms with fewer analyst following significantly outperform those with more analysts over 48 months by between 8% and 9% (panel A: excluding U.S. firms) and 10% to 12% (panel B: including U.S. firms).[19] Note, however, that even firms with high analyst following experience significantly positive long-run abnormal returns. Thus, asymmetric information and lower information production might explain some of the long-run abnormal returns but it is clearly not the full story.

According to the *takeover hypothesis*, the excess returns are a result of the fact that the market fails to understand that a buyback makes a takeover bid more likely or is at least an indication of a higher takeover probability. This should not be surprising as when a firm signals through a buyback that it may be undervalued, it seems normal that it would attract attention from potential bidders. At the same time, a buyback can be considered as a method to get rid of "weak hands" so that the company is in a better position to negotiate a better deal once a takeover bid is made. Thus, the *takeover hypothesis* predicts that the excess returns are a result of the takeover premiums received after the buyback. Billett and Hui (2007) find that open market repurchases are more likely if a firm has a higher takeover probability. However, they don't find that the actual

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[19] This result is not surprising considering that analyst following and the U-index are negatively correlated (see table 5).

number of takeovers after buybacks is higher than for non-buyback firms, suggesting that buybacks are efficient in deterring takeover bids. Bargeron, Bonaime, and Thomas (2012), based on a U.S. sample, find that long-run abnormal returns are due to the fact that the firms are taken over after the buyback. They conclude that once the likelihood of takeovers is incorporated in a model of expected returns, the buyback anomaly disappears.

Table 10 reports long-run abnormal returns for firms separately depending on whether the buyback firm has received a takeover offer in the 36 months following the buyback announcement. Takeover targets are identified using the SDC database (see Appendix E for details of the identification). Of our buyback sample, we classify 12.7% firms as targets, 19.3% of U.S. firms and only 4.3% of non-U.S. firms. In panel A the sample excludes U.S. firms and we find that the differences in long-run returns between firms that are taken over after the buyback and other firms are all insignificant using various benchmark models. The data is thus inconsistent with the takeover hypothesis in that excess returns are only the consequence of successful subsequent takeover bids. Panel B shows results for U.S. firms. Consistent with findings in Bargeron et al. (2012), we now find that firms which become takeover targets outperform more. However, the fact that the non-targets (which represent 80 % of our sample) also earn significant long-term excess returns of 24 % after 48 months (4 factor model) suggests that takeover bids alone cannot explain the outperformance. We thus conclude that the takeover hypothesis cannot explain long-run abnormal returns outside the U.S. and is not a full explanation for the U.S. sample, especially considering that only 19.3% of all U.S. buyback firms are taken over within the next 3 years.

Grullon and Michaely (2004) conclude that stock prices outperform after buybacks in part because markets are slow to realize that buyback firms experience a significant drop in systematic risk as they move from being growth companies to being more mature businesses. Thus, repurchasing firms can buy back stock cheaply given the discount rate applied in the market is too high. The *reduction in risk hypothesis* predicts outperformance because firms' systematic risk is actually going down and the market is slow to realize this.

To test the *reduction in risk hypothesis* we closely follow Grullon and Michaely (2004) in estimating the change in firm risk. For each buyback firm i we estimate the following one-factor model:

$$R_{it} - R_{ft} = \alpha_{i,\text{Bef}}D_{it} + \alpha_{i,\text{Aft}}(1 - D_{it}) + \beta_{i,\text{Bef}}D_{it}(R_{mt} - R_{ft}) + \beta_{i,\text{Aft}}(1 - D_{it})(R_{mt} - R_{ft}) + \varepsilon_{it} \ (3)$$

where D_{it} is an indicator variable equal to 1 if calendar month t precedes the buyback announcement month (i.e. months -36 to -1 relative to the announcement month), 0 otherwise (i.e. months 0 to +36 relative to the announcement month), and R_m and R_f are the market return and the risk-free rate of return. Analogous three-

and four-factor models are also estimated. The coefficient estimates for each buyback firm are then stored, and Table 11 describes their distribution. For the one factor model we find an average (median) market beta of 0.96 (0.86) before the buyback and 0.92 (0.85) after the buyback. 54% of the firms experience a decrease in beta, and only in 6% of the buyback announcements the decrease is statistically significant. Similar results obtain when looking at the exposure to the size (SMB), value (HML), and momentum (UMD) factors, also reported in Table 11. The results suggest that risk in buyback firms does not go down systematically. Thus, the average long-run abnormal returns in our sample cannot be attributed to markets underreacting to changes in risk after the buyback announcement.

4.2.4 Corporate governance and long term returns

If long term excess returns are a result of the fact that a buyback reduces agency costs of free cash flow, firms with high agency costs or low corporate governance quality should benefit more. On the other hand if markets are concerned that a buyback is driven by other reasons than shareholder value maximization, we expect that high governance quality firms experience larger excess returns.

Gompers et al. (2003), using a governance measure based on takeover defenses, find positive long-run abnormal returns for good governance firms relative to bad governance firms. Their interpretation is that the market underestimates the importance of governance quality for firm value. If our buyback firms are, on average, better governance firms, the documented outperformance could be due to the same underestimation of the importance of governance, and unrelated to the buyback itself. We use all available CQG scores for the buyback firms, and compare them to the CQG scores of the non-buyback firms in the same country. The average CGQ is 46.21 for buyback firms, and 49.55 for non-buyback firms. The difference in means is statistically significant, indicating that the buyback firms, overall, have *worse* governance if anything. Thus, it is unlikely that the buyback sample is a self-selected group of good governance firms.

We run a long-run return analysis for two portfolios splitting the sample at the median CQG level. The long-run returns are shown in Table 12. Panel A shows results excluding the U.S., panel B is based on U.S. firms. Excluding U.S. firms, we find no significant (at the 5% or more) differences in long-run abnormal returns between high and low CGQ index firms, although for the three- and four-factor models high quality governance firms always have higher long term returns than low quality governance firms, and the difference is statistically significant at the 10 % level over the 36 month horizon. On the other hand, U.S. firms show a strong and

significant negative relation between corporate governance quality and long run excess returns, regardless of the model of market equilibrium or the time horizon. This is strong evidence that reduction in agency costs of free cash flow are an important explanation for the long term excess returns observed in the U.S. sample. Apparently, outside the U.S. investors are concerned about the motivation for the buyback, i.e. whether it is driven by concern for shareholder value. This concern outweighs any consideration that low corporate governance firms could actually benefit the most from a reduction of agency costs of free cash flow. In order to test whether this difference between foreign and U.S. firms is really a consequence of the buyback, we also calculate abnormal returns in the 36 months *before* the buyback. The results are shown in the Appendix (Table A1 and Figure A1). There is no evidence that in our sample corporate governance quality before the buyback is related to pre-buyback excess returns, in contrast to Gompers et al. (2003). Note also that the lack of correlation between corporate governance quality and the U-index as well as takeover likelihood (Table 5) implies that the evidence on market timing and the corporate governance results are truly independent.

We repeat our analysis but now with country level measures of governance quality. In Table 13 we report sample splits based on the GMI index, and the Loderer et al. (2010) index, respectively. Across both country level governance variables we find that better governance is associated with higher abnormal returns. Differences between high and low governance quality at the country level are also economically meaningful. For example, using the GMI index as a proxy for governance quality, we find a cumulative abnormal return difference of 17.31% over 48 months using the four factor model. These results are consistent with the hypothesis that companies in good governance countries tend to buy back stock for "good" reasons. Although bad governance firms in theory could benefit more from reducing agency costs of free cash flows, agency theory assumes that bad managers are pressured by board members or shareholder activists to pay out excess cash. In countries with poor governance quality such pressure may not exist. This, of course, does not mean that excess returns cannot be partially explained by reductions in agency costs of free cash flow: we find that low governance quality firms outperform significantly after a buyback announcement. However, the generally positive relation between corporate governance quality and long term returns is inconsistent with the hypothesis that agency costs reductions are the main motivation behind the buyback decision.

4.2.5 Regulation and long term returns

Buybacks are subject to various regulatory constraints around the world. Some countries (such as the U.K.) require companies to disclose immediately (the day after) that a firm has bought back shares. Other countries require monthly reporting or periodic reporting in the financial statements. Some countries restrict the percentage of shares repurchased to 10% of the shares outstanding, as long as the shares are not canceled, i.e. as long as they are held as treasury stock. Other countries (such as e.g., India) insist that when a firm announces a buyback program, it completes at least a significant part of the program, i.e. the company does not have the complete flexibility to exercise the repurchase option. It is not obvious whether these regulations have a material impact on short term and long term returns after buybacks. However, we believe one type of regulation may have a significant impact on long term returns, i.e., whether buybacks have to be approved by shareholders or only by the board.

The undervaluation hypothesis, in the *overreaction* version, i.e. the market overreacts to bad news and managers take advantage of the undervalued stock price to benefit long term shareholders, does find support in the data, as shown in the previous section. Thus, the question is whether market timing is easier to do in countries that allow the *board to approve* a buyback. Having the buyback approved by the shareholders seems to leave less room for timing if managers want to take advantage of repurchasing shares at a low price. Indeed, the announcements of buyback authorizations may also be simply routine requests at a shareholders meeting, not an immediate, timely response to undervaluation. Evidence of this can be seen in Figure 5 that shows the distribution of the announcements per month, for 3 samples: U.S. firms, non-U.S. firms where board approval is necessary and finally non-U.S. firms that require shareholder approval. The figure shows a strong clustering of announcements in shareholder approval countries in May. On closer inspection this is driven by Japanese firms who always have their shareholder meetings in May and use the meetings to get buyback authorizations.

In Table 14 we show sample splits by whether the board or shareholder approval is necessary for a buyback initiation. Over 48 months we find that firms in board approval countries outperform more than firms in shareholder approval countries. We find very economically and statistically significantly higher long-run (48 months) return of between 20% (one factor model) to 24% (three-factor model). We conclude that country-specific variables such as governance quality and regulation are important to assess the impact of a repurchase decision for shareholder value. Although the market realizes this to some extent (to wit, the impact on short term announcement returns) it underestimates the importance. One caveat: the high correlation (80%) between

board approval and governance quality (Table 5) suggests that there may be no independent board approval effect. In high quality governance countries boards typically approve buybacks. The fact that regulators require shareholder approval does not really improve shareholder returns, quite the contrary.

Together these findings are consistent with the hypothesis that investors outside the U.S. also underreact to buyback announcements. Similar to the findings in Peyer and Vermaelen (2009), managers seem to use the prior return, market cap, and book-to-market as a reference point to determine whether their stock price is undervalued. However, there are some significant differences with the U.S. In particular excess returns after U.S. buybacks seem to be driven not only by market timing but by reduction in agency costs of free cash flow. For companies in other countries we can't make such a conclusion.

4.3. Cross-sectional tests of long-run abnormal returns

The various sample splits discussed so far suggest that undervaluation (measured by the U-index) is a key driver of long-term abnormal returns. We also found that governance quality at the country level is positively related to abnormal returns, although in the U.S. there is a negative correlation between company-specific measures of governance quality and excess returns. Finally, it is better that a buyback is approved by the board than by shareholders. On the other hand we find no evidence that the decrease in risk can explain abnormal returns and we find no support for the takeover hypothesis (at least when we exclude U.S. firms) which argues that long term excess returns are simply the result of successful subsequent takeovers. However, to the extent that these variables are potentially correlated (table 5), the question arises whether each one of them independently helps explaining the cross-section of long-run abnormal returns.

To address this question, we regress firm-level long-run returns following the buyback announcement on a number of variables related to undervaluation, corporate governance, and regulation. We obtain estimates of the long-run risk-adjusted returns for individual buyback firms in the spirit of Brennan et al. (1998) as follows. For a given stock in a given calendar month, the four-factor risk-adjusted return is computed as the risk-free rate of return plus the residual from a regression of the stock's excess return on the market excess return and the size, book-to-market, and momentum factors.[20] Risk-adjusted returns are then averaged over the 36-month period following the buyback announcement date, obtaining the risk-adjusted average monthly

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[20] The regression is estimated on the entire 1998-2011 period. One- and three-factor risk-adjusted returns can be constructed analogously. For brevity, we only report results based on the four-factor adjustment in this section.

returns. These are used as the dependent variables in the regressions reported in Table 15. Columns (1)-(4) exclude U.S. buybacks, while columns (5)-(8) include them. Each specification includes the U-index and the firm-level governance quality measure CGQ (as well as their interactions with an indicator for U.S. buybacks in columns (5)-(8)). Specifications (1)-(3) and (5)-(7) include the GMI index, the Loderer et al. index, and the board approval indicator; these variables are included in separate regressions because of the high correlations among them. Finally, regressions (4) and (8) include a full set of country indicators. Regardless of the risk adjustment, or the sample, we find that long term returns are significantly positively correlated with the U-index. The strength of the relationship between U-index and long-run returns in the U.S. is not significantly different from the non-U.S. case. Hence the hypothesis that companies try to take advantage of market overreaction to bad news is robust around the world. The coefficient on analyst coverage has the expected sign, but it is not always significantly different from zero, possibly due to its relatively high correlation with the U-index (40%).

Moreover, consistent with our previous results (Table 13), there is a significant positive relation between returns and country-specific governance, measured by the GMI and Loderer indexes. Similarly, the board approval indicator coefficient is positive, and highly statistically significant, consistent with the findings of Table 14. Changes in firm risk, proxied by the change in beta, as well as takeover threats, are insignificantly related to long-run returns, except in the case of U.S. buybacks, where takeover targets earn significantly higher long-run retuns.

Firm-level corporate governance quality, measured by the CGQ index, is associated with higher long-run returns around the world. However, once we include U.S. buybacks (columns (5)-(8)), while the coefficient on CGQ remains positive and statistically significant, the coefficient on $CGQ \times U.S.$ has a negative sign and is nearly identical in magnitude. So we confirm the conclusions of Table 12: U.S. and non-U.S. firms respond differently to corporate governance quality. Governance quality should be positively related to returns if it indicates that the buyback is driven by concern for shareholder value. On the other hand it should be negatively related to returns if low governance quality firms can benefit more from the reduction in agency costs of free cash flow. It seems that in the U.S. the second effect is as important as the first one, in other words, agency cost reductions are seen as an important source of value creation in buybacks. In the rest of the world we don't see

this benefit possibly because there is not enough pressure (from board members, activist investors, potential hostile bidders) to force bad managers to pay out excess cash.

5. Conclusions

Share buybacks around the world generate significant positive announcement returns. Moreover, the market underreacts to the buyback announcements, generating significant excess returns to a long term investor. Long-term excess returns are an anomaly in an efficient market, so the fact that this anomaly is global makes it more likely that the U.S. findings are not a result of sample bias. We also document that country governance quality matters: both short term and long term excess returns are positively related to country governance quality. The Anglo-Saxon premise that the goal of a firm is to maximize long term shareholder value is not universally accepted, which means that buybacks are often used for non-value maximizing reasons such as fighting takeovers and/or eliminating shareholders which do not support the management. Hence, as a first step, investors use country governance quality measures to assess the reason for the buyback.

When considering the two main competing hypotheses to explain excess returns, agency cost reductions and undervaluation, it seems that the hypothesis that managers buy back shares to take advantage of a undervalued stock price explains short term and long run returns around the world. Specifically, we find that short term and long term returns are positively related to measures of undervaluation such as the U-index.. However, we find strong evidence that long run excess returns in the U.S. are also driven by the benefits from a reduction in the agency cost of free cash flow. In contrast to non-U.S. firms, high corporate governance quality is not associated with higher long term and short term returns. This is consistent with the hypothesis that in foreign countries, the quality of corporate governance has to be high in order to ensure that a buyback is motivated by shareholder value maximization. In a country with high quality governance, such as the U.S., buybacks are, on average, driven by "good" reasons. Sometimes managers want to take advantage of an undervalued stock price, but sometimes they are forced by the board to reduce the agency costs of free cash flow, a benefit that is more important in relatively low governance quality firms.

One major finding is the fact that shareholders are better off when the board has to approve the buyback. One interpretation is that board authorization gives more timely flexibility for managers who want to opportunistically buy back undervalued stock. At the same time, the idea that a company should time the market

by taking advantage of short term selling shareholders to the benefit of long term shareholders may also be difficult to sell as a reasonable motivation to shareholders who have to approve the buyback. Alternatively, considering that countries where board approval is sufficient also are the countries with high governance quality, the result may simply show that corporate governance quality is the ultimate protector of shareholder value. The insistence of e.g. European regulators to have the buyback approved by shareholders does not compensate for poor corporate governance, and may well have unintended consequences as it provides less flexibility to managers to timely use buybacks to create long term shareholder value.

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Appendix

A. Variable definitions

I. Features of the buyback and the buyback firm

Percentage sought

Percentage of the outstanding shares that the firm intends to buy back. This variable is retrieved from the SDC Mergers and Acquisitions and Repurchases data sets.

Percentage of publicly traded firms announcing a buyback

For each nation and year in the sample, this ratio is computed as the number of buyback announcement divided by the number of firms with stock return information available from Datastream.

U-Index

"Undervaluation" index, in the spirit of Peyer and Vermaelen (2009). It is constructed as follows. All buyback firms in the sample are assigned a score based on their cumulative raw return over the six-month period prior to the buyback announcement, size, and book-to-market ratio relative to the distribution of prior returns, size (market value of equity), and book-to-market ratios in their reference Fama-French geographical area (Europe, Japan, Asia-Pacific Ex Japan, and North America, when using U.S. dollar returns and global factors) or their local market (when using local market returns and country factors). A given firm will receive a prior return "score" of 1 if its return prior to the buyback announcement is above the 70th percentile, 2 if it is between the 30th and the 70th percentile, and 3 if it is below the 30th percentile. Size and book-to-market scores are similarly assigned. The U-index is the sum of the prior return, size, and book-to-market scores, and ranges from 3 (least likely undervalued) to 9 (most likely undervalued).

II. Country characteristics

GovernanceMetrics International® Index

The overall country rating provided by GovernanceMetrics International® (GMI). The GMI rating criteria are based on securities regulations, stock exchange listing requirements, and various corporate governance codes and principles, such as the ones promulgated by the OECD, the Commonwealth Association for Corporate Governance, the International Corporate Governance Network and the Business Roundtable. GMI combines firm-level governance information, and determines an average score at the country level. The ratings are available at the URL: http://www.gmiratings.com, and were retrieved as of September 2009. A GMI index is not available for the Philippines, thus for buyback announcements from this country the value of the GMI index for "Emerging Markets" is used as a replacement.

Loderer et al. (2010) Index

An index of the extent to which the firms of a given country want to maximize shareholder value. It is based on the survey results of Loderer et al. (2010), and is equal to the fraction of firms in a given country that mention "shareholder value" in their mission statement (Table III, column (1) of Loderer et al.'s paper).

Board approval (Y/N)

Indicator variable equal to 1 if board approval is sufficient for the firm to announce a share buyback program, 0 if the shareholders' approval is also required. The countries for which board approval is sufficient are: Australia, Canada, India, Israel, New Zealand, Switzerland, Taiwan, and Thailand.

French civil law, German civil law, Scandinavian civil law, English common law

Indicator variables denoting the legal origin of the repurchasing firm's country. The legal origin classification is the one adopted by La Porta et al. (1998), Djankov et al. (2007), and Siems (2007).

Stock market capitalization to GDP

Ratio of stock market capitalization to GDP. The variable is retrieved from the World Bank "Financial Structure" data (Beck, Demirgüç-Kunt, and Levine, 2009).

Stock market turnover

Stock market turnover for a given nation. The variable is retrieved from the World Bank "Financial Structure" data (Beck, Demirgüç-Kunt, and Levine, 2009).

III. Firm-level corporate governance quality indexes

ISS Corporate Governance Quotient (CGQ)

The Corporate Governance Quotient (CGQ) is an index of the quality of corporate governance at the firm level, released by the Institutional Shareholder Service (ISS) corporation. To generate a CGQ for each company, ISS uses public disclosure documents to gather data on 61 different issues in the following eight categories: 1) board of directors, 2) audit, 3) charter and bylaw provisions, 4) anti-takeover provisions, 5) executive and director compensation, 6) progressive practices, 7) ownership, and 8) director education. Based on this information and a scoring system developed by an external advisory panel and ISS, a CGQ is calculated for each company. Each company's CGQ is then compared to the CGQ of companies in the same country, obtaining a relative ranking. The data on the ISS CGQ cover the period up to and including October 2007, for a subset of the repurchasing firms examined in this paper. ISS starts coverage of different firms at different points in time, and in many cases later than the repurchase announcement in our sample. To apply the same criterion to all announcements, the value of the CGQ index as of the nearest date to the announcement date is assigned, and matched to the repurchase announcement data based on the firm's stock's SEDOL code.

IV. Other control variables

Cumulative raw return over prior 6 months

The cumulative raw stock return over the six months preceding the repurchase announcement.

Size

Firm size, equal to the natural logarithm of the firm's market value of equity (in U.S. dollars).

Book-to-Market

Book-to-Market ratio. For non-U.S. firms, it is given by 1 divided by Datastream's MTBV variable. For U.S. firms, it is defined as the ratio of book value of total assets to market value. Total assets are given by Compustat data item AT. The market value is obtained as total assets minus book equity plus market value of equity. The market value of equity is given by stock price (Compustat data item PRCC_C) times shares outstanding (data item CSHO). Book equity is defined as shareholders' equity (data item SEQ), or common equity (data item CEQ) plus preferred stock, or total assets minus total liabilities (data item LT) minus preferred stock plus deferred taxes and investment tax credit (data item TXDITC) minus postretirement benefit asset (data item PRBA). Preferred stock is evaluated at liquidation value (data item PSTKL), or redemption value (data item PSTKRV), or as total preferred stock (data item PSTK). For robustness, the *Book-to-Market* variable is Winsorized at the 1st and 99th percentiles.

Leverage

Leverage ratio. It is defined as the ratio of total debt to total assets. For non-U.S. firms, total debt is given by Worldscope data item WC03255 and total assets by data item WC02999. For U.S. firms,

total debt is given by the sum of short and long term debt (Compustat data items DLC and DLTT), and total assets by data item AT.

Dividend payout ratio

It is defined as the ratio of cash dividends to total assets. For non-U.S. firms, cash dividends are given by Worldscope data item WC05376, and total assets by data item WC02999. For U.S. firms, cash dividends are given by Compustat data item DV, and total assets by data item AT.

Change in beta

Percentage drop in CAPM beta around the buyback announcement. For each buyback firm, a CAPM beta is estimated over the 36-month period preceding the buyback announcement, as well as over the 36-month period subsequent to the announcement, following the method of Grullon and Michaely (2004). The *Change in beta* variable is then defined as the percentage drop in beta following the buyback announcement, equal to the drop in beta divided the pre-announcement beta. For robustness, this variable is Winsorized at the 1st and 99th percentiles.

B. Cleaning the stock return data from Datastream

A number of studies have pointed out that the quality of international stock return data from Datastream is lower than that of the CRSP data (Ince and Porter, 2006, Karolyi et al., 2009, Baker and Wurgler, 2010). This problem is especially serious in the case of the long-run return following the repurchase announcement, as well as in the construction of the factor-mimicking portfolio returns. In order to clean up the monthly stock return data used in our sample, we implement three filters, following Ince and Porter (2006; please refer to this paper for a more detailed descriptions of the filters). First, in order to avoid using stale prices due to delisting, for every stock we eliminate all zero returns starting from the most recent observation, until the last non-zero return. Second, we control for 'typos' in the input of the data. We do so by setting any return above 300% that is reversed within one month as missing. Third, as a last step for every month in the sample and every nation we censor stock returns below the 1st and above the 99th percentiles.

C. Sample selection details

The sources of open-market repurchase announcement data used in this paper are the Security Data Corporation's (SDC) Mergers and Acquisitions and Repurchases data bases. As explained in the text, in order to perform the analysis the repurchase announcement data from the SDC data bases are merged with a number of other sources: Datastream stock return data, Worldscope, GovernanceMetrics international, and the ISS Corporate Governance Quotient data. All the results reported implicitly require that complete observations of all the relevant variables are available. This implies that only a subset of the entire open-market repurchase announcements from SDC are used in the analysis. The table below illustrates the coverage of the original SDC data.

Nation	SDC Announcements	Announcements used	Nation	SDC Announcements	Announcements used
Japan	2730	2644	Austria	59	48
Canada	2304	1949	Thailand	48	48
Australia	545	484	Finland	61	41
France	402	346	Mexico	40	37
Malaysia	256	248	Sweden	40	36
Hong Kong	224	197	New Zealand	49	33
Germany	207	193	Denmark	41	33
South Korea	158	142	Spain	40	32
United Kingdom	183	134	Philippines	40	31
Brazil	148	107	Belgium	36	27
Switzerland	118	103	Norway	32	27
Taiwan	120	101	Greece	39	23
India	133	81	Israel	62	21
Italy	87	78	Indonesia	20	20
China	72	59	Singapore	25	19
Netherlands	67	52			

D. Estimating buyback completion rates

While in some jurisdictions firms are required to disclose their actual share buyback activity to the financial market authority, these disclosure requirements are heterogeneous and in any case do not apply to all the countries in our sample. Therefore, we estimate actual buyback activity, following the indications of the literature. Stephens and Weisbach (1998) consider three different methods to estimate the actual quantity of shares bought back by the firm: (i) decreases in shares outstanding, (ii) dollars spent reacquiring securities, (iii) increases in the dollar value of the firm's treasury stock.

Given the limited availability of data on Worldscope, we focus on the first method. For each buyback firm in our sample and each month $t = 1, ..., 48$ subsequent to the announcement date, we obtain the number of shares outstanding N_t as the Datastream data item NOSH. We then consider monthly decreases in shares outstanding, i.e. $-\min\{N_t - N_{t-1}, 0\}$, as the actual shares bought back. As Stephens and Weisbach (1998), we do not offset monthly decreases with monthly increases, i.e. if the number of shares has increases on a given month, we assume the actual buyback activity to be 0. For U.S. buyback announcements, we replicate this procedure using monthly changes in the CRSP number of shares outstanding (CRSP data item SHROUT). To the extent that the firm both repurchases and distributes shares within a given month, this method provides a lower bound for the actual buyback activity. We scale the cumulative decrease in shares outstanding by the number of shares outstanding one month prior to the buyback announcement, obtaining the percentage of shares bought back. The completion rate in a given month is then the ratio between this percentage and the percentage of shares sought for repurchase. As Stephens and Weisbach (1998), whenever the completion rate exceeds 100%, we set it to 100% (this could happen, for instance, if there are overlaps with subsequent buyback announcements).

Table 2 (Panel B) presents summary statistics about completion rates for the sample countries. On average, the completion rate for buyback programs 1 year after the announcement date is 59%,

increasing to 71%, 79%, and 84%, 2, 3, and 4 years after the buyback announcement. In comparison, using the same method Stephens and Weisbach (1998) find an average completion rate for U.S. buybacks of about 74% at 3 years after the announcement date. Combining this estimate with the alternative methods available to them (but not to us), Stephens and Weisbach (1998) are able to "bound expected actual repurchases during the three years following the announcement of the program at between 74 percent and 82 percent," reasonably close to the estimates for our international sample. Similarly to Stephens and Weisbach (1998), we also find a bimodal distribution for actual buyback activity: while more than half of the sample firms repurchase at least complete the buyback program within one year of the announcement date, about 10% do not appear to repurchase any shares within four years (unreported for brevity).[21]

E. Identifying takeover targets among buyback firms

We retrieve all takeover announcements for firms from our sample countries over the 1997-2011 period from the Security Data Corporation (SDC) Mergers and Acquisitions database. We restrict the attention to completed acquisitions, where following the acquisition the bidder owns at least 50% of the target's shares. We then match the identifying information for the target firms to the buyback firms in our sample, and we assign a given buyback firm to the "takeover target" group if the buyback firm was the target of an acquisition over the period from one month prior to the buyback announcement until three years (36 months) after the buyback announcement. We supplement this information with delisting information from Datastream, obtained by screening the "extended name" (ENAM) data item for all our sample firms, and consider as takeover targets also the firms reported as delisted within the three-year window (the results are qualitatively similar if this additional information is not included). Based on this approach, 12.7% of our sample firms are classified as "takeover targets".

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[21] In comparison, Stephens and Weisbach (1998) find that: "More than one-half of the firms complete their announced programs and nearly one-third repurchase twice as many shares as they originally announced, but one-tenth of the firms repurchase less than 5 percent of their announced intentions."

Table 1 Summary Statistics

The table reports summary statistics on open-market repurchase announcements, over the period 1998-2008. For each country, the table reports the number of announcements and corresponding percentage of all publicly traded firms with available data in Datastream, and the average, standard deviation, min and max percentage of the shares that the firms seek to repurchase The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries with the largest number of announcements over the sample period, plus open-market share announcements by U.S. firms over the same period. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

Nation	Number of announcements	Number of firms	Number of ann.s per firm (average)	Number of ann.s per firm (max)	Ann.s as% of traded stocks	Percentage sought in the repurchase	P.tage sought - st. dev.	P.tage sought - min	P.tage sought - max
Global Non-U.S.	7394	4738	1.6	-	-	7.4	4.3	0.1	50.0
United States	10093	4495	2.2	15	15.6	9.3	8.2	0.0	50.0
Region: America Ex-U.S.									
Brazil	107	72	1.5	5	2.2	6.9	5.7	1.5	42.8
Canada	1949	893	2.2	10	3.2	6.5	2.9	0.2	50.0
Mexico	37	28	1.3	2	3.4	5.4	6.2	0.1	25.0
Region: Asia-Pacific Ex-Japan									
Australia	484	327	1.5	6	3.2	9.3	5.1	1.4	47.4
China	59	54	1.1	3	0.6	8.9	5.6	3.1	29.9
Hong Kong	197	179	1.1	3	2.4	9.6	2.5	0.1	22.0
India	81	63	1.3	5	0.9	12.7	7.6	1.7	40.0
Indonesia	20	16	1.3	3	0.8	10.6	6.0	1.9	20.0
Malaysia	248	229	1.1	4	2.5	9.9	0.8	3.4	12.5
New Zealand	33	24	1.4	5	2.4	9.4	10.2	3.5	46.0
Philippines	31	26	1.2	3	1.3	10.5	8.0	0.5	28.8
Singapore	19	18	1.1	2	0.7	10	0.3	9.1	10.3
South Korea	142	117	1.2	3	0.8	5.3	2.5	0.4	17.8
Taiwan	101	88	1.1	4	1.2	4.8	3.2	0.4	30.3
Thailand	48	47	1.0	2	1.3	8.5	3.0	1.0	20.0
Region: Europe									
Austria	48	34	1.4	3	4.2	9.1	2.3	0.3	10.2
Belgium	27	18	1.5	3	1.2	9.8	1.9	4.0	14.3
Denmark	33	21	1.6	4	1.4	8.3	6.9	1.0	33.9
Finland	41	27	1.5	6	2.7	5	2.0	0.8	10.8
France	346	271	1.3	4	3.3	9.4	4.7	0.6	46.9
Germany	193	154	1.3	6	1.8	9.3	4.3	0.3	50.0
Greece	23	22	1.0	2	1.0	9.2	3.9	4.0	22.0
Israel	21	20	1.1	2	0.6	7.6	2.9	3.5	10.2
Italy	78	68	1.1	3	2.5	8.8	2.7	1.7	14.8
Netherlands	52	36	1.4	4	2.9	7.5	5.0	0.3	25.0
Norway	27	22	1.2	2	1.5	8.6	6.0	2.2	33.5
Spain	32	27	1.2	3	1.6	7.2	9.2	0.1	50.0
Sweden	36	27	1.3	3	1.1	9.4	3.8	2.8	20.0
Switzerland	103	63	1.6	6	3.3	7.5	3.1	0.1	15.2
United Kingdom	134	126	1.1	3	0.6	11.9	8.0	0.3	50.0
Region: Japan									
Japan	2644	1621	1.6	8	6.6	6.7	4.3	0.1	47.6

Table 2 Completion Rates

The table reports statistics on country average completion rates (fraction of the announced buyback that is actually completed, expressed as a number between 0 (no completion) to 100 (full completion)), from the announcement date up to four subsequent years. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries with the largest number of announcements over the sample period, plus open-market share announcements by U.S. firms over the same period. Buyback completion rates are estimated following the procedure described in the appendix. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

Nation	Year 1	Year 2	Year 3	Year 4
Global Non-U.S.	59	71	79	84
United States	75	85	89	93
Region: America Ex-U.S.				
Brazil	60	68	75	79
Canada	36	61	78	86
Mexico	73	78	81	89
Region: Asia-Pacific Ex-Japan.				
Australia	44	63	81	90
China	86	88	93	93
Hong Kong	59	72	82	88
India	49	59	64	72
Indonesia	45	60	65	80
Malaysia	41	62	75	81
New Zealand	58	58	70	79
Philippines	61	68	71	71
Singapore	63	74	79	95
South Korea	58	63	76	82
Taiwan	41	79	96	98
Thailand	42	52	73	81
Region: Europe				
Austria	33	42	60	63
Belgium	70	78	82	89
Denmark	55	58	64	82
Finland	37	56	66	90
France	32	62	70	89
Germany	44	58	70	77
Greece	78	91	91	96
Israel	86	90	90	90
Italy	50	56	72	80
Netherlands	67	79	87	96
Norway	38	65	79	100
Spain	41	50	63	75
Sweden	22	28	36	42
Switzerland	49	54	68	78
United Kingdom	59	67	78	91
Region: Japan				
Japan	23	33	45	48

Table 3 Announcement Returns

The table reports the cumulative abnormal returns around the sample of open-market repurchase announcements. The cumulative abnormal returns are computed by cumulating the daily abnormal returns over 3-day (-1,+1), 5-day (-2,+2), and 7-day (-3,+3) windows around the announcement date (columns (1), (4), and (7)). Columns (2), (5), and (8) report the corresponding t-statistics. The abnormal return on any given day is equal the difference between the actual return and the market return. The columns labeled " U.S. pctile" ((3), (6), and (9)) report the fraction of average announcement returns that are smaller than the ones reported in the table, from the bootstrap based on U.S. repurchase announcements from the period 1998-2008 (the bootstrap procedure is described in detail in the text). The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries with the largest number of announcements over the sample period, plus U.S. announcements over the same period. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. Stock and market return data are obtained from Datastream for non-U.S. firms, and from CRSP for U.S. firms. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% level.

Nation	CAR (-1,+1)	t-stat	U.S. pctile	CAR (-2,+2)	t-stat	U.S. pctile	CAR (-3,+3)	t-stat	U.S. pctile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Global Non-U.S.	1.27***	15.53	0.00	1.38***	14.65	0.00	1.48***	13.68	0.00
United States	2.18***	25.70	-	2.13***	22.18	-	2.02***	19.21	-
Region: America Ex-U.S.									
Brazil	0.25	0.51	0.01	0.64	0.93	0.05	1.51*	1.87	0.32
Canada	1.90***	9.51	0.05	2.01***	8.90	0.27	2.23***	8.70	0.84
Mexico	0.27	0.18	0.07	0.72	0.40	0.19	1.50	0.79	0.39
Region: Asia-Pacific Ex-Japan									
Australia	2.34***	6.32	0.70	2.18***	5.64	0.55	2.17***	5.25	0.64
China	5.40***	3.21	1.00	2.03	1.34	0.49	0.96	0.50	0.21
Hong Kong	-0.80	-1.26	0.00	-0.56	-0.79	0.00	-0.94	-1.14	0.00
India	2.54***	3.30	0.65	2.49***	2.72	0.62	1.84*	1.95	0.44
Indonesia	-1.75*	-1.73	0.01	-0.79	-0.57	0.07	-1.03	-0.54	0.09
Malaysia	-0.17	-0.62	0.00	0.30	0.87	0.00	-0.09	-0.24	0.00
New Zealand	3.17***	2.84	0.76	3.82***	2.77	0.85	4.53***	2.57	0.92
Philippines	2.55**	2.09	0.60	3.83***	2.79	0.86	3.76***	2.67	0.84
Singapore	3.85*	1.78	0.82	2.61	1.17	0.59	1.01	0.47	0.32
South Korea	1.17*	1.71	0.07	0.96	1.17	0.06	0.91	0.98	0.09
Taiwan	0.56	1.00	0.02	0.43	0.63	0.02	0.48	0.62	0.05
Thailand	3.62***	3.92	0.89	3.83***	4.56	0.89	3.62***	3.01	0.86
Region: Europe									
Austria	1.31	1.66	0.25	1.54	1.55	0.35	1.95**	1.96	0.48
Belgium	1.46**	2.10	0.31	2.07***	2.73	0.49	2.51**	2.47	0.60
Denmark	2.44***	3.00	0.59	2.13**	2.42	0.49	2.05**	2.40	0.51
Finland	1.16	1.29	0.23	0.39	0.39	0.10	0.68	0.47	0.18
France	-0.09	-0.42	0.00	0.25	0.75	0.00	0.25	0.66	0.00
Germany	3.09***	5.70	0.92	2.99***	5.15	0.89	2.48***	3.63	0.73
Greece	0.48	0.32	0.13	0.92	0.58	0.24	0.95	0.51	0.28
Israel	1.48	0.67	0.32	2.50	0.99	0.60	1.88	0.77	0.49
Italy	0.59	1.40	0.04	0.12	0.25	0.03	0.61	1.11	0.12
Netherlands	1.54**	2.11	0.30	2.02**	2.10	0.49	1.78*	1.75	0.46
Norway	0.83	0.84	0.18	2.98***	2.57	0.70	3.93**	2.50	0.84
Spain	1.61**	2.45	0.36	1.03	1.21	0.25	0.65	0.55	0.22
Sweden	1.13	1.03	0.23	1.79	1.36	0.43	1.91	1.48	0.48
Switzerland	0.74**	2.40	0.04	0.85**	2.49	0.09	1.16***	2.76	0.19
United Kingdom	0.83	1.64	0.03	1.13*	1.76	0.12	1.44**	2.05	0.27
Region: Japan									
Japan	0.86***	7.91	0.00	1.05***	7.85	0.00	1.21***	7.59	0.00

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Table 4 Announcement Returns – Country Level

In Panel A, the table reports the average announcement returns for buyback announcements taking place in countries with different legal origins, and F test statistics for the differences among them. Columns (1)-(4) include the U.S. buyback announcements, columns (5)-(8) exclude them.

In panel B, the table reports the estimates of a model:

$$CAR_i = \alpha + \beta'NationChar_i + \gamma'x_i + \varepsilon_i$$

where *CAR* is the average cumulative abnormal return around the announcement date for all repurchasing firms belonging to a given nation, i.e. each observation in the sample is one nation. For a given firm, the abnormal return on a given date is the difference between the firm's stock return and the return on the market index. The firm-level announcement return is estimated over a 3-day (-1,+1) window around the announcement date, and firm-level announcement returns are averaged to obtain a country-level announcement return. *NationChar* is a set of characteristics of the repurchasing firm's nation: legal origin value (LaPorta et al., 1998, Djankov et al., 2007, Siems, 2007), the GovernanceMetrics International® index, the Loderer et al. (2010) index of the importance of shareholder value in the country, the indicator variable for Board Approval (Y/N) of repurchase programs in the country. *x* is a vector of control variables including the average Percentage sought and Completion rate of repurchase programs in the country, the percentage of publicly listed firms announcing a buyback in the country, the natural logarithm of the country's GDP, the size rank of the country's stock market, and Stock market turnover. In columns (1)-(4), the sample excludes U.S. buybacks, while in columns (5)-(8) it includes them. The regression is estimated using Weighted Least Squares (WLS), where the weights are the number of repurchase announcements in each country. The t-statistics are based on heteroskedasticity-robust standard errors. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

A. Announcement Returns and Legal Origin

	Excluding U.S. buybacks				Including U.S. buybacks			
	English common law	Scandinavian civil law	German civil law	French civil law	English common law	Scandinavian civil law	German civil law	French civil law
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average announcement return	0.0166***	0.0108***	0.0140**	0.0037	0.0205***	0.0108***	0.0140**	0.0037
t-test	*13.41*	*7.87*	*2.08*	*1.29*	*29.86*	*7.87*	*2.08*	*1.29*
F test – Difference from English common law		0.18	11.04***	20.61***		0.93	39.82***	32.39***
p-value		(0.67)	(0.00)	(0.00)		(0.33)	(0.00)	(0.00)
F test – Difference from Scandinavian civil law			0.27	2.49			0.21	1.97
p-value			(0.60)	(0.11)			(0.65)	(0.16)
F test – Difference from German civil law				6.30**				4.99**
p-value				(0.01)				(0.03)

Table 4 Announcement Returns – Country Level – cont'd

B. Cross-sectional Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Scandinavian legal origin	-0.0079				-0.0090*			
	-1.34				*-1.72*			
German legal origin	-0.0160*				-0.0123**			
	-1.88				*-2.37*			
French legal origin	-0.0254***				-0.0240***			
	-5.17				*-5.04*			
GovernanceMetrics International® index		0.0062***				0.0039***		
		5.90				*5.20*		
Loderer et al. (2010) index			0.0766***				0.0569***	
			4.28				*4.43*	
Missing Loderer et al. (2010) index			0.0201				0.0118	
			1.55				*0.96*	
Board approval (Y/N)				0.0153***				0.0133***
				5.53				*5.19*
Control variables: Percentage sought, completion rate (country average),% of publicly listed firms announcing a share buyback, ln(GDP), Stock market size rank, Stock market turnover								
N. Obs.	31	31	31	31	32	32	32	32
R^2	0.553	0.577	0.620	0.508	0.705	0.666	0.720	0.669

Table 5 Correlation Matrices

Correlations among the variables used in the sample splits in the subsequent analysis. In panel A, the sample is restricted to all non-U.S. buyback announcements. In panel B, it focuses on U.S. buyback announcements. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. All variables are defined in detail in the Appendix.

	A.	Non-U.S. Buybacks					
	U-index	Board approval (Y/N)	Analyst coverage	Change in Beta	Takeover target (Y/N)	CGQ index	Gov'Metrics index
Board approval (Y/N)	-0.1516						
Analyst coverage	-0.3980	-0.0419					
Change in Beta	-0.0182	-0.0223	0.0314				
Takeover target (Y/N)	-0.0326	0.0125	0.0436	0.0352			
CGQ index	-0.0481	0.3724	0.1761	-0.0167	0.0188		
Gov'Metrics index	-0.1770	0.8453	0.1068	-0.0083	0.0473	0.5016	
Loderer et al. (2010) index	-0.1248	0.8115	-0.1610	-0.0108	-0.0044	0.1787	0.6999

B. U.S. Buybacks			
	Analyst coverage	Change in Beta	Takeover target (Y/N)	CGQ index
Analyst coverage	-0.2426			
Change in Beta	0.0087	-0.0175		
Takeover target (Y/N)	0.0340	-0.0466	0.0233	
CGQ index	-0.0164	-0.001	-0.0278	0.0275

Table 6 Announcement Returns – Firm Level Cross-Sectional Regressions

The table reports the estimates of a regression of the cumulative abnormal return around the announcement date on firm characteristics. The abnormal return on a given date is the difference between the firm's stock return and the return on the market index. It is cumulated over a three-day (-1,+1) window around the announcement date. The buyback firm characteristics are the ISS Corporate Governance Quotient (CGQ, replaced by 0 where missing; observations with missing CGQ index are identified by the Missing CGQ indicator) and the U-index (all defined in detail in the Appendix). Control variables include size (natural logarithm of market value of equity), cumulative raw return on the firm's stocks over the 6 months leading to the announcement month, book-to-market (these variables are excluded when the U-index is included, as the U-index is defined in terms of size, book-to-market, and prior return), leverage, dividend payout ratio, and percentage of stocks the firm is seeking to repurchase. In columns (1)-(3), the sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries with the largest number of announcements over the sample period, excluding U.S. buyback announcements. In columns (4)-(6), the sample includes only U.S. buyback announcements. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. In order to account for the potential correlation between observations corresponding to firms from the same nation, in columns (1)-(3) the standard errors are clustered at the nation level, while in columns (4)-(6) they are heteroskedasticity-robust. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% level.

	Non-U.S. Buybacks			U.S. Buybacks		
	(1)	(2)	(3)	(4)	(5)	(6)
CGQ index	0.0095***		0.0079***	0.0003		-0.0005
	2.97		2.77	0.06		-0.08
Missing CGQ index	-0.0018		0.0054**	0.0038		0.0065
	-0.56		2.55	0.68		1.16
U-index		0.0012**	0.0011**		0.0120***	0.0118***
		2.66	2.19		6.87	6.72
Prior return	-0.0117*			-0.0205***		
	-1.92			-3.62		
Size	-0.0036**			-0.0062***		
	-2.70			-5.74		
Book-to-market	-0.0024			0.0093*		
	-1.58			1.89		
Dividend payout ratio	-0.0389***	-0.0353***	-0.0359***	0.0124	0.0085	0.0115
	-3.32	-3.15	-3.17	0.46	0.28	0.38
Leverage	0.001	-0.0008	-0.0007	-0.0185*	-0.0257***	-0.0264***
	0.15	-0.09	-0.08	-1.94	-2.76	-2.81
Percentage sought	0.0146	0.0195	0.0183	0.0343*	0.0371*	0.0361*
	0.68	0.81	0.77	1.75	1.85	1.80
Intercept	0.0296*	0.0018	-0.0022	0.0548***	-0.0348***	-0.0347***
	1.72	0.20	-0.27	4.22	-2.93	-2.81
Announcement year indicators	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	4885	4885	4885	3590	3590	3590
R^2	0.017	0.008	0.009	0.050	0.031	0.032

Table 5 Long-Run Returns (Calendar-Time Method)
The table reports the monthly calendar-time alphas over 12-, 24-, 36-, and 48-month horizons following the announcement date. Panel A reports the alphas on a "global" (non-U.S.) calendar-time portfolio pooling together all buyback announcements and for U.S. buybacks separately, estimating abnormal returns using the Fama-French global factors. Panel B reports the calendar-time alphas at the regional level, using the Fama-French regional factors. The partition into regions corresponds to the one followed by Fama and French (2012), with the additions of Brazil and Mexico to America Ex-U.S., Israel to Europe, and China, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand, to Asia-Pacific Ex-Japan. The subsequent panels report calendar-time alphas at the individual country level, based on one- (Panel C), three- (Panel D), and four-factor (Panel E) models (in each case, using U.S. dollar returns and regional factors). In all panels, the t-statistics are based on heteroskedasticity-robust standard errors. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix. Panels C, D, and E, also report the long-run returns following U.S. buyback announcements over the same period. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

A. Calendar-Time Alphas

	Alpha (12 months)	t-stat	Alpha (24 months)	t-stat	Alpha (36 months)	t-stat	Alpha (48 months)	t-stat
Global (Non-U.S.) buybacks								
One-factor model	0.73***	3.50	0.80***	4.24	0.73***	4.22	0.68***	4.02
Three-factor model	0.40**	2.39	0.47***	3.29	0.46***	3.59	0.41***	3.31
Four-factor model	0.57***	3.39	0.60***	4.34	0.58***	4.48	0.53***	4.23
U.S. buybacks								
One-factor model	0.61***	2.74	0.67***	3.20	0.58***	2.92	0.54***	2.71
Three-factor model	0.35**	2.08	0.36***	2.65	0.33**	2.55	0.28**	2.23
Four-factor model	0.50***	3.92	0.48***	4.23	0.44***	3.90	0.39***	3.54

B. Calendar-Time Alphas by Region

Region	Alpha (12 months)	t-stat	Alpha (24 months)	t-stat	Alpha (36 months)	t-stat	Alpha (48 months)	t-stat
One-Factor Model								
America Ex-U.S.	1.11***	3.20	1.09***	3.53	0.98***	3.33	0.96***	3.26
Asia-Pacific Ex-Japan	0.76**	2.43	0.73***	2.87	0.63***	2.63	0.71***	3.09
Europe	0.27	1.27	0.29	1.54	0.10	0.51	0.24*	1.66
Japan	0.62**	2.31	0.62***	2.58	0.65***	2.90	0.66***	2.99
Three-Factor Model								
America Ex-U.S.	0.82**	2.52	0.84***	2.81	0.75***	2.78	0.73***	2.70
Asia-Pacific Ex-Japan	0.89***	2.88	0.84***	3.33	0.74***	3.29	0.82***	3.84
Europe	0.10	0.49	0.07	0.44	-0.10	-0.58	0.06	0.65
Japan	0.28*	1.77	0.29**	2.13	0.29**	2.37	0.30**	2.50
Four-Factor Model								
America Ex-U.S.	0.85**	2.45	0.85***	2.76	0.75***	2.63	0.73***	2.60
Asia-Pacific Ex-Japan	1.05***	3.39	0.99***	3.86	0.88***	3.78	0.94***	4.26
Europe	0.25	1.22	0.24*	1.66	0.02	0.12	0.17	1.63
Japan	0.34**	2.16	0.34***	2.58	0.33***	2.78	0.34***	2.89

Table 7 Long-Run Returns (Calendar-Time Method) – cont'd

C. One-Factor Model

Nation	Alpha (12 months)	t-stat	U.S. pctile	Alpha (24 months)	t-stat	U.S. pctile	Alpha (36 months)	t-stat	U.S. pctile	Alpha (48 months)	t-stat	U.S. pctile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
United States	0.61***	2.74	-	0.67***	3.20	-	0.58***	2.92	-	0.54***	2.71	-
Region: America Ex-U.S.												
Brazil	2.47**	2.21	1.00	2.13**	2.34	1.00	1.99**	2.55	1.00	2.14***	2.87	1.00
Canada	1.06***	3.02	1.00	1.06***	3.35	1.00	0.97***	3.23	1.00	0.94***	3.11	1.00
Mexico	1.47*	1.95	0.91	1.54***	2.94	0.96	0.86*	1.90	0.74	1.15***	2.74	0.94
Region: Asia-Pacific Ex-Japan												
Australia	0.95***	2.93	0.96	0.85***	2.91	0.96	0.62**	2.49	0.56	0.64***	2.66	0.72
China	-0.55	-0.64	0.02	-0.03	-0.04	0.03	-0.15	-0.23	0.01	-0.05	-0.08	0.01
Hong Kong	1.49	0.69	1.00	-0.48	-0.43	0.00	0.28	0.34	0.04	0.65	0.86	0.67
India	1.90**	2.20	1.00	1.76**	2.46	1.00	1.42**	2.01	1.00	1.33*	1.93	1.00
Indonesia	0.47	0.41	0.45	1.98*	1.94	0.97	1.31	1.51	0.89	1.17	1.46	0.88
Malaysia	0.39	0.43	0.17	0.60	0.73	0.42	0.70	0.91	0.72	0.66	0.84	0.71
New Zealand	0.11	0.18	0.21	0.22	0.38	0.16	0.22	0.48	0.16	0.30	0.70	0.21
Philippines	5.94	0.94	1.00	3.63	0.94	1.00	3.73	1.05	1.00	3.00	1.23	1.00
Singapore	-0.74	-0.97	0.06	-0.87	-1.02	0.01	-1.11*	-1.90	0.00	-0.81	-1.53	0.00
South Korea	0.92	0.80	0.81	1.50	1.31	1.00	1.18	1.15	0.99	0.84	0.87	0.91
Taiwan	-0.79	-0.97	0.00	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	0.71	0.97	0.54	1.69***	2.83	0.99	1.59***	2.90	0.99	1.62***	3.00	1.00
Region: Europe												
Austria	1.11*	1.91	0.80	0.72	1.57	0.59	0.76**	2.00	0.65	0.72**	1.98	0.65
Belgium	1.14**	2.20	0.73	0.78*	1.83	0.57	0.64*	1.75	0.50	0.37	1.09	0.27
Denmark	0.37	0.58	0.36	0.76	1.43	0.60	0.80*	1.83	0.67	0.35	0.86	0.23
Finland	-0.77	-1.17	0.01	-0.09	-0.17	0.04	0.13	0.31	0.09	0.14	0.36	0.10
France	0.31	0.99	0.05	0.36	1.65	0.04	0.32	1.64	0.02	0.34*	1.93	0.03
Germany	-0.46	-1.16	0.00	-0.10	-0.32	0.00	0.03	0.10	0.00	-0.07	-0.25	0.00
Greece	-1.85**	-2.25	0.00	-1.18	-1.52	0.00	-0.93	-1.55	0.00	-0.92	-1.65	0.00
Israel	1.87	1.56	0.94	1.54	1.48	0.94	0.84	0.91	0.69	0.95	1.06	0.83
Italy	-0.05	-0.12	0.08	-0.07	-0.21	0.02	-0.35	-1.09	0.00	-0.13	-0.46	0.00
Netherlands	0.54	0.89	0.45	0.43	1.06	0.31	0.06	0.15	0.06	0.22	0.67	0.13
Norway	-0.62	-0.61	0.05	-0.39	-0.56	0.03	-0.49	-0.62	0.01	-0.10	-0.15	0.04
Spain	0.77	1.31	0.57	0.37	0.84	0.28	-0.07	-0.17	0.05	0.16	0.47	0.13
Sweden	1.68***	2.95	0.93	1.50***	3.67	0.95	1.33***	4.35	0.95	1.23***	4.35	0.96
Switzerland	0.60*	1.72	0.45	0.28	1.04	0.11	0.17	0.65	0.04	0.34	1.45	0.14
United Kingdom	0.54	1.05	0.39	0.64*	1.79	0.50	0.43	1.52	0.20	0.37	1.40	0.15
Region: Japan												
Japan	0.62**	2.31	0.36	0.62***	2.58	0.35	0.65***	2.90	0.82	0.66***	2.99	0.98

Table 7 Long-Run Returns (Calendar-Time Method) – cont'd

D. Three-Factor Model

Nation	Alpha (12 months)	t-stat	U.S. pctile	Alpha (24 months)	t-stat	U.S. pctile	Alpha (36 months)	t-stat	U.S. pctile	Alpha (48 months)	t-stat	U.S. pctile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
United States	0.35**	2.08	-	0.36***	2.65	-	0.33**	2.55	-	0.28**	2.23	-
Region: America Ex-U.S.												
Brazil	2.28**	1.98	1.00	2.04**	2.09	1.00	1.91**	2.32	1.00	2.06***	2.58	1.00
Canada	0.78**	2.34	1.00	0.79***	2.62	1.00	0.73***	2.68	1.00	0.70**	2.54	1.00
Mexico	1.27*	1.69	0.92	1.41***	2.66	0.98	0.74	1.56	0.85	1.05**	2.42	0.98
Region: Asia-Pacific Ex-Japan												
Australia	1.26***	3.99	1.00	1.14***	4.01	1.00	0.91***	3.90	1.00	0.92***	4.15	1.00
China	-0.31	-0.34	0.10	0.10	0.14	0.26	-0.04	-0.06	0.16	0.07	0.11	0.28
Hong Kong	1.57	0.66	1.00	-0.84	-0.77	0.00	0.07	0.08	0.13	0.39	0.52	0.77
India	1.56*	1.90	0.99	1.47**	2.08	1.00	1.18*	1.71	1.00	1.11	1.65	1.00
Indonesia	-0.03	-0.02	0.35	1.74*	1.67	0.97	1.25	1.44	0.94	1.08	1.35	0.94
Malaysia	0.04	0.48	0.56	0.61	0.83	0.92	0.80	1.17	0.99	0.76	1.10	1.00
New Zealand	0.013	0.20	0.35	0.19	0.33	0.37	0.21	0.45	0.39	0.30	0.70	0.54
Philippines	6.27	0.90	1.00	3.87	0.92	1.00	4.11	1.07	1.00	3.31	1.26	1.00
Singapore	-0.42	-0.53	0.20	-0.71	-0.84	0.05	-0.92	-1.61	0.01	-0.81	-1.57	0.01
South Korea	0.12	0.09	0.24	1.24	0.98	1.00	1.03	0.93	1.00	0.65	0.62	0.97
Taiwan	-1.09	-1.30	0.00	-0.37	-0.52	0.02	-0.37	-0.57	0.01	-0.34	-0.53	0.01
Thailand	0.70	1.05	0.71	1.69***	3.01	1.00	1.64***	3.12	1.00	1.68***	3.28	1.00
Region: Europe												
Austria	0.30	0.61	0.45	0.04	0.11	0.26	0.17	0.55	0.37	0.25	0.85	0.49
Belgium	0.54	1.01	0.58	0.15	0.35	0.37	0.07	0.21	0.30	-0.06	-0.20	0.22
Denmark	-0.12	-0.18	0.27	0.26	0.48	0.46	0.40	0.89	0.60	0.01	0.03	0.25
Finland	-0.77	-1.14	0.04	-0.13	-0.23	0.17	-0.01	-0.02	0.21	0.03	0.06	0.28
France	0.19	0.56	0.21	0.20	0.97	0.21	0.15	0.81	0.15	0.18	1.20	0.28
Germany	-0.58	-1.51	0.00	-0.11	-0.33	0.03	-0.03	-0.11	0.05	-0.15	-0.55	0.01
Greece	-2.05***	-2.69	0.00	-1.83**	-2.41	0.00	-1.33**	-2.36	0.00	-1.31**	-2.56	0.00
Israel	1.82	1.65	0.96	1.24	1.37	0.94	0.76	0.85	0.84	0.87	1.00	0.92
Italy	-0.20	-0.46	0.13	-0.23	-0.63	0.06	-0.49	-1.51	0.01	-0.25	-0.91	0.03
Netherlands	0.52	0.96	0.60	0.43	1.13	0.62	0.02	0.06	0.26	0.15	0.44	0.39
Norway	-0.69	-0.70	0.08	-0.42	-0.58	0.08	-0.74	-0.89	0.02	-0.33	-0.50	0.08
Spain	0.44	0.64	0.54	-0.08	-0.17	0.21	-0.49	-1.06	0.04	-0.16	-0.48	0.15
Sweden	1.19**	2.49	0.89	1.09***	2.92	0.93	1.00***	3.58	0.94	0.98***	3.88	0.97
Switzerland	0.02	0.05	0.21	-0.04	-0.15	0.11	-0.09	-0.34	0.08	0.14	0.61	0.32
United Kingdom	0.09	0.18	0.21	0.31	0.96	0.47	0.12	0.48	0.23	0.15	0.64	0.33
Region: Japan												
Japan	0.28*	1.77	0.12	0.29**	2.13	0.22	0.29**	2.37	0.48	0.30**	2.50	0.84

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Table 7 Long-Run Returns (Calendar-Time Method) – cont'd

E. Four-Factor Model

Nation	Alpha (12 months)	t-stat	U.S. pctile	Alpha (24 months)	t-stat	U.S. pctile	Alpha (36 months)	t-stat	U.S. pctile	Alpha (48 months)	t-stat	U.S. pctile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
United States	0.50***	3.92	-	0.48***	4.23	-	0.44***	3.90	-	0.39***	3.54	-
Region: America Ex-U.S.												
Brazil	2.29**	2.02	1.00	2.07**	2.16	1.00	1.94**	2.41	1.00	2.09***	2.68	1.00
Canada	0.79**	2.26	1.00	0.80**	2.56	1.00	0.73**	2.55	1.00	0.69**	2.43	1.00
Mexico	1.25*	1.68	0.88	1.43***	2.66	0.97	0.74	1.53	0.80	1.03**	2.36	0.96
Region: Asia-Pacific Ex-Japan												
Australia	1.26***	3.72	1.00	1.13***	3.68	1.00	0.92***	3.63	1.00	0.93***	3.86	1.00
China	-.012	-0.13	0.14	0.33	0.44	0.39	0.20	0.30	0.29	0.27	0.43	0.40
Hong Kong	1.53	0.69	1.00	-0.84	-0.83	0.00	0.01	0.02	0.02	0.33	0.47	0.45
India	2.25**	2.44	1.00	2.09***	2.69	1.00	1.76**	2.28	1.00	1.72**	2.29	1.00
Indonesia	0.11	0.09	0.36	1.84	1.61	0.98	1.35	1.32	0.94	1.23	1.33	0.95
Malaysia	0.94	0.90	0.95	1.01	1.12	0.99	1.17	1.36	1.00	1.14	1.32	1.00
New Zealand	0.46	0.75	0.47	0.43	0.78	0.48	0.41	0.89	0.49	0.49	1.14	0.62
Philippines	6.65	0.94	1.00	4.20	0.98	1.00	4.33	1.09	1.00	3.57	1.32	1.00
Singapore	-0.41	-0.50	0.17	-0.80	-0.94	0.03	-0.94	-1.60	0.01	-0.86*	-1.67	0.01
South Korea	0.90	0.68	0.90	1.82	1.46	1.00	1.56	1.35	1.00	1.25	1.11	1.00
Taiwan	-1.04	-1.23	0.00	-0.25	-0.33	0.02	-0.24	-0.35	0.01	-0.20	-0.30	0.02
Thailand	0.74	1.11	0.67	1.72***	2.92	1.00	1.59***	2.95	1.00	1.64***	3.09	1.00
Region: Europe												
Austria	0.35	0.67	0.42	-0.04	-0.08	0.13	0.15	0.44	0.25	0.18	0.59	0.31
Belgium	0.40	0.77	0.45	-0.04	-0.10	0.20	-0.02	-0.07	0.18	-0.11	-0.37	0.13
Denmark	-0.01	-0.02	0.28	0.39	0.66	0.48	0.49	0.98	0.60	0.04	0.10	0.19
Finland	-0.63	-0.89	0.05	0.03	0.05	0.19	0.08	0.17	0.20	0.07	0.16	0.22
France	0.46	1.38	0.45	0.34	1.57	0.27	0.28	1.42	0.20	0.25	1.61	0.20
Germany	-0.28	-0.74	0.01	0.14	0.44	0.08	0.22	0.77	0.18	0.11	0.40	0.08
Greece	-2.56***	-2.90	0.00	-1.40*	-1.70	0.00	-1.04*	-1.73	0.00	-1.05*	-1.94	0.00
Israel	2.10*	1.79	0.97	1.28	1.26	0.93	0.75	0.76	0.78	0.86	0.90	0.89
Italy	-0.13	-0.31	0.12	-0.16	-0.46	0.04	-0.42	-1.33	0.00	-0.19	-0.73	0.02
Netherlands	0.20	0.32	0.33	0.48	1.06	0.56	0.15	0.33	0.28	0.17	0.42	0.31
Norway	-1.12	-1.13	0.02	-0.53	-0.70	0.04	-0.91	-0.95	0.00	-0.61	-0.88	0.01
Spain	0.39	0.55	0.46	-0.09	-0.17	0.16	-0.49	-1.00	0.02	-0.14	-0.36	0.10
Sweden	1.40***	2.72	0.90	1.28***	3.48	0.95	1.05***	3.75	0.93	1.01***	4.04	0.95
Switzerland	-0.07	-0.23	0.10	-0.04	-0.16	0.06	-0.13	-0.42	0.03	0.15	0.59	0.19
United Kingdom	0.24	0.41	0.25	0.47	1.39	0.55	0.21	0.79	0.21	0.27	1.16	0.35
Region: Japan												
Japan	0.34**	2.16	0.02	0.34***	2.58	0.04	0.33***	2.78	0.08	0.34***	2.89	0.31

Table 8Long-Run Returns (IRATS Method)
The table reports the long-run returns over 12-, 24-, 36-, and 48-month horizons following the buyback announcement date the Ibbotson (1975) Returns Across Time and Securities (RATS) method. Panel A reports the cumulative long-run return on a "global" (non-U.S.) sample pooling together all buyback announcements and the U.S. sample separately, estimating abnormal returns using the Fama-French global factors. Panel B reports the calendar-time alphas at the regional level. The partition into regions corresponds to the one followed by Fama and French (2012), with the additions of Brazil and Mexico to America, Israel to Europe, and China, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand, to Asia-Pacific Ex-Japan. The subsequent panels report calendar-time alphas at the individual country level, based on one- (Panel C), three- (Panel D), and four-factor (Panel E) models (in each case, using U.S. dollar returns and Fama-French regional factors). In all panels, the standard errors are clustered around country and announcement calendar month. The columns labeled "p-value" report the p-values associated with the chi-square test statistic for the cumulative alphas. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix. Panels C, D, and E, also report the long-run returns following U.S. buyback announcements over the same period. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

A. IRATS Long-Run Returns

	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
	Global (Non-U.S.) buybacks							
One-factor model	12.64***	(0.00)	26.68***	(0.00)	37.69***	(0.00)	44.16***	(0.00)
Three-factor model	6.89***	(0.00)	15.18***	(0.00)	21.61***	(0.00)	25.62***	(0.00)
Four-factor model	7.51***	(0.00)	16.37***	(0.00)	22.90***	(0.00)	27.05***	(0.00)
	U.S. buybacks							
One-factor model	6.18***	(0.00)	19.80***	(0.00)	34.72***	(0.00)	43.63***	(0.00)
Three-factor model	3.65***	(0.00)	11.00***	(0.00)	19.03***	(0.00)	22.96***	(0.00)
Four-factor model	5.58***	(0.00)	13.39***	(0.00)	21.19***	(0.00)	25.43***	(0.00)

B. IRATS Long-Run Returns by Region

Region	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
	One-Factor Model							
America Ex-U.S.	13.43***	(0.00)	31.17***	(0.00)	50.05***	(0.00)	63.32***	(0.00)
Asia-Pacific Ex-Japan	6.80**	(0.01)	14.71***	(0.00)	18.65***	(0.00)	30.45***	(0.00)
Europe	2.86*	(0.06)	10.97***	(0.00)	17.42***	(0.00)	23.86***	(0.00)
Japan	12.72***	(0.00)	24.69***	(0.00)	32.75***	(0.00)	32.72***	(0.00)
	Three-Factor Model							
America Ex-U.S.	9.99***	(0.00)	23.07***	(0.00)	37.21***	(0.00)	48.00***	(0.00)
Asia-Pacific Ex-Japan	7.39***	(0.00)	15.16***	(0.00)	20.16***	(0.00)	32.81***	(0.00)
Europe	1.24	(0.44)	5.87***	(0.00)	7.58***	(0.00)	10.15***	(0.00)
Japan	5.53***	(0.00)	11.10***	(0.00)	14.41***	(0.00)	16.21***	(0.00)
	Four-Factor Model							
America Ex-U.S.	10.16***	(0.00)	23.22***	(0.00)	37.14***	(0.00)	47.61***	(0.00)
Asia-Pacific Ex-Japan	8.64***	(0.00)	17.62***	(0.00)	23.45***	(0.00)	35.70***	(0.00)
Europe	3.26**	(0.03)	9.36***	(0.00)	11.93***	(0.00)	14.79***	(0.00)
Japan	5.30***	(0.00)	9.92***	(0.00)	13.14***	(0.00)	14.74***	(0.00)

Table 8 Long-Run Returns (IRATS Method) – cont'd

C. One-Factor Model

Nation	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	6.18***	(0.00)	19.80***	(0.00)	34.72***	(0.00)	43.63***	(0.00)
Region: America Ex-U.S.								
Brazil	32.64***	(0.00)	70.78***	(0.00)	83.79***	(0.00)	113.61***	(0.00)
Canada	12.20***	(0.00)	28.65***	(0.00)	47.92***	(0.00)	60.82***	(0.00)
Mexico	14.78	(0.15)	42.02***	(0.00)	41.35***	(0.00)	53.95***	(0.00)
Region: Asia-Pacific Ex-Japan								
Australia	8.14**	(0.02)	17.64***	(0.00)	22.88***	(0.00)	31.37***	(0.00)
China	13.66**	(0.03)	21.42*	(0.09)	18.07	(0.33)	26.04	(0.22)
Hong Kong	12.19	(0.25)	7.39	(0.48)	12.07	(0.24)	54.50***	(0.00)
India	24.68***	(0.00)	55.37***	(0.00)	77.94***	(0.00)	93.08***	(0.00)
Indonesia	38.97***	(0.00)	61.59***	(0.00)	77.85***	(0.00)	84.48***	(0.00)
Malaysia	-5.60	(0.20)	-9.32*	(0.07)	-08.10	(0.14)	-04.37	(0.48)
New Zealand	745	(0.27)	14.10	(0.25)	15.06	(0.29)	20.16	(0.17)
Philippines	62.21	(0.34)	63.93	(0.32)	86.57	(0.21)	114.98	(0.18)
Singapore	-5.93	(0.38)	-9.41	(0.30)	-26.63**	(0.03)	-27.96**	(0.02)
South Korea	15.34*	(0.06)	39.99***	(0.00)	38.83***	(0.00)	47.97***	(0.00)
Taiwan	-13.73***	(0.01)	-14.31**	(0.03)	-14.85*	(0.08)	-19.27**	(0.02)
Thailand	12.69**	(0.05)	39.88***	(0.01)	42.56***	(0.01)	56.23***	(0.00)
Region: Europe								
Austria	4.65	(0.40)	13.93**	(0.05)	32.98***	(0.00)	43.17***	(0.00)
Belgium	9.97	(0.22)	18.04**	(0.02)	26.06***	(0.01)	26.49**	(0.02)
Denmark	-2.82	(0.74)	22.75**	(0.02)	37.77***	(0.00)	32.27*	(0.05)
Finland	-2.80	(0.57)	7.64	(0.29)	25.65***	(0.00)	42.54***	(0.00)
France	5.79*	(0.07)	14.09***	(0.00)	17.74***	(0.00)	27.02***	(0.00)
Germany	-8.27*	(0.10)	-6.80	(0.27)	-0.28	(0.97)	10.10	(0.19)
Greece	-12.66*	(0.07)	-4.04	(0.71)	-6.97	(0.63)	-32.92*	(0.05)
Israel	15.02	(0.15)	28.81	(0.12)	27.58	(0.12)	19.44	(0.27)
Italy	4.89	(0.31)	6.87	(0.16)	3.55	(0.51)	-01.47	(0.86)
Netherlands	7.97**	(0.03)	12.56**	(0.05)	9.49	(0.35)	11.87	(0.34)
Norway	5.72	(0.63)	14.39	(0.26)	25.44	(0.19)	33.73	(0.22)
Spain	14.87**	(0.01)	18.89*	(0.06)	22.45*	(0.07)	22.36*	(0.09)
Sweden	21.90***	(0.00)	46.70***	(0.00)	66.80***	(0.00)	79.39***	(0.00)
Switzerland	3.23	(0.20)	12.80***	(0.00)	20.00***	(0.00)	27.09***	(0.00)
United Kingdom	0.98	(0.82)	10.69**	(0.03)	19.95***	(0.00)	27.14***	(0.00)
Region: Japan								
Japan	12.48***	(0.00)	24.52***	(0.00)	31.53***	(0.00)	31.10***	(0.00)

Table 8 Long-Run Returns (IRATS Method) – cont'd

D. Three-Factor Model

Nation	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	3.65***	(0.00)	11.00***	(0.00)	19.03***	(0.00)	22.96***	(0.00)
			Region: America Ex-U.S.					
Brazil	27.93***	(0.00)	59.89***	(0.00)	68.24***	(0.00)	95.26***	(0.00)
Canada	08.85***	(0.00)	20.31***	(0.00)	34.45***	(0.00)	43.74***	(0.00)
Mexico	08.43	(0.38)	29.14***	(0.01)	20.89*	(0.09)	31.32**	(0.04)
			Region: Asia-Pacific Ex-Japan					
Australia	07.01**	(0.03)	15.50***	(0.00)	19.63***	(0.00)	28.22***	(0.00)
China	11.30*	(0.09)	15.90	(0.23)	15.78	(0.41)	22.44	(0.31)
Hong Kong	10.00	(0.3)	5.31	(0.57)	10.31	(0.33)	53.55***	(0.00)
India	22.71***	(0.00)	50.60***	(0.00)	73.93***	(0.00)	90.27***	(0.00)
Indonesia	34.67***	(0.00)	54.46***	(0.00)	72.82***	(0.00)	81.18***	(0.00)
Malaysia	-6.82*	(0.10)	-11.58**	(0.02)	-8.25	(0.14)	-5.18	(0.43)
New Zealand	3.53	(0.61)	10.39	(0.39)	10.51	(0.46)	12.46	(0.38)
Philippines	63.35	(0.33)	60.63	(0.35)	83.61	(0.23)	112.29	(0.19)
Singapore	-5.11	(0.50)	-11.15	(0.23)	-29.59**	(0.02)	-30.89**	(0.02)
South Korea	16.56**	(0.01)	36.20***	(0.00)	35.19***	(0.00)	48.33***	(0.00)
Taiwan	-14.45***	(0.01)	-16.80***	(0.01)	-16.90*	(0.05)	-18.93**	(0.02)
Thailand	9.70*	(0.09)	34.78**	(0.01)	40.08***	(0.01)	55.37***	(0.00)
			Region: Europe					
Austria	1.79	(0.75)	6.28	(0.37)	21.04***	(0.00)	31.29***	(0.00)
Belgium	7.29	(0.35)	12.23*	(0.09)	17.15*	(0.1)	14.88	(0.21)
Denmark	-4.75	(0.54)	15.91*	(0.09)	24.37**	(0.02)	16.73	(0.27)
Finland	-5.19	(0.34)	0.15	(0.98)	10.46	(0.22)	20.53*	(0.05)
France	4.11	(0.19)	6.37*	(0.08)	2.37	(0.53)	6.97	(0.13)
Germany	-11.19**	(0.03)	-14.64**	(0.02)	-13.17*	(0.07)	-5.61	(0.50)
Greece	-16.62**	(0.02)	-14.84	(0.15)	-23.90*	(0.08)	-52.99***	(0.00)
Israel	13.58	(0.17)	25.63	(0.15)	26.70	(0.12)	25.46	(0.14)
Italy	3.64	(0.46)	2.25	(0.64)	-5.55	(0.32)	-11.99	(0.11)
Netherlands	7.26**	(0.05)	10.96*	(0.08)	3.32	(0.75)	4.60	(0.70)
Norway	4.30	(0.70)	8.57	(0.49)	12.94	(0.49)	16.34	(0.53)
Spain	11.38**	(0.04)	12.51	(0.18)	11.23	(0.32)	7.97	(0.52)
Sweden	17.02***	(0.00)	37.49***	(0.00)	51.72***	(0.00)	60.52***	(0.00)
Switzerland	2.57	(0.31)	8.52**	(0.01)	12.01**	(0.01)	18.09***	(0.00)
United Kingdom	0.58	(0.88)	8.63*	(0.09)	10.85**	(0.03)	12.84**	(0.04)
			Region: Japan					
Japan	6.30***	(0.00)	0.13.43***	(0.00)	17.01***	(0.00)	16.99***	(0.00)

Table 8 Long-Run Returns (IRATS Method) – cont'd

E. Four-Factor Model

Nation	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	05.58***	(0.00)	13.39***	(0.00)	21.19***	(0.00)	25.43***	(0.00)
Region: America Ex-U.S.								
Brazil	27.19***	(0.00)	59.01***	(0.00)	67.14***	(0.00)	94.07***	(0.00)
Canada	09.26***	(0.00)	20.80***	(0.00)	34.67***	(0.00)	43.93***	(0.00)
Mexico	8.61	(0.38)	29.38***	(0.01)	20.21	(0.11)	30.41**	(0.05)
Region: Asia-Pacific Ex-Japan								
Australia	7.81**	(0.01)	16.91***	(0.00)	20.82***	(0.00)	29.28***	(0.00)
China	10.07	(0.13)	14.82	(0.27)	14.85	(0.45)	21.69	(0.33)
Hong Kong	10.38	(0.27)	6.94	(0.44)	11.58	(0.28)	54.69***	(0.00)
India	23.81***	(0.00)	52.47***	(0.00)	75.73***	(0.00)	92.00***	(0.00)
Indonesia	34.06***	(0.00)	54.54***	(0.00)	72.91***	(0.00)	81.31***	(0.00)
Malaysia	-5.66	(0.16)	-9.55*	(0.06)	-6.10	(0.27)	-2.9	(0.65)
New Zealand	4.31	(0.54)	12.24	(0.31)	12.07	(0.40)	14.09	(0.32)
Philippines	63.31	(0.33)	60.82	(0.35)	84.08	(0.23)	112.69	(0.19)
Singapore	-0.48	(0.53)	-10.67	(0.24)	-29.06**	(0.02)	-30.56**	(0.02)
South Korea	15.25**	(0.01)	33.82***	(0.00)	32.69***	(0.00)	45.62***	(0.00)
Taiwan	-12.86**	(0.01)	-13.78**	(0.03)	-13.92	(0.10)	-15.92**	(0.04)
Thailand	9.41*	(0.09)	35.39***	(0.01)	40.88***	(0.01)	56.17***	(0.00)
Region: Europe								
Austria	2.53	(0.66)	7.63	(0.28)	22.79***	(0.00)	32.91***	(0.00)
Belgium	8.63	(0.26)	14.34**	(0.05)	18.99*	(0.06)	16.60	(0.16)
Denmark	-0.40	(0.61)	17.17*	(0.07)	25.54**	(0.01)	17.64	(0.25)
Finland	-04.29	(0.42)	1.48	(0.84)	11.55	(0.17)	21.34**	(0.05)
France	5.73*	(0.07)	8.44**	(0.02)	4.59	(0.25)	9.13*	(0.06)
Germany	-10.03**	(0.05)	-12.99**	(0.04)	-11.54	(0.1)	-4.1	(0.62)
Greece	-14.82**	(0.04)	-12.46	(0.24)	-21.65	(0.12)	-50.88***	(0.00)
Israel	13.13	(0.18)	25.23	(0.16)	26.24	(0.12)	25.05	(0.14)
Italy	4.26	(0.39)	2.95	(0.55)	-4.70	(0.40)	-11.32	(0.13)
Netherlands	8.39**	(0.02)	12.06*	(0.06)	4.18	(0.69)	5.32	(0.66)
Norway	5.17	(0.65)	9.51	(0.44)	13.90	(0.46)	17.02	(0.51)
Spain	12.04**	(0.03)	14.59	(0.12)	13.31	(0.25)	9.78	(0.43)
Sweden	17.47***	(0.00)	39.47***	(0.00)	53.92***	(0.00)	62.64***	(0.00)
Switzerland	3.50	(0.16)	9.61***	(0.00)	12.75***	(0.01)	18.68***	(0.00)
United Kingdom	1.38	(0.72)	10.02*	(0.05)	11.85**	(0.02)	13.51**	(0.03)
Region: Japan								
Japan	6.39***	(0.00)	13.54***	(0.00)	17.74***	(0.00)	17.58***	(0.00)

Table 9 Long-Run Returns and Undervaluation

The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method. The estimates are based on U.S. dollar returns, and the regional factors used in Fama and French (2012). In panel A, the sample is restricted to share buybacks announced outside of the United States. In panel B, the sample includes United States buybacks only. All panels report estimates of the cumulative abnormal returns over horizons spanning 12, 24, 36, and 48 months following the buyback announcement date, using one-, three-, and four-factor models. In both panels, the rows labeled "High U-index", "Low U-index", and "High – Low U-index" refer to a partition of the sample based on the U-index, which assigns each repurchasing firm a combined score based on the raw return prior to the buyback announcement, the firm's size, and the firm's book-to-market ratio, as described in the appendix. A given firm belongs to the "High U-index" ("Low U-index") group if its U-index is above the 70th percentile (below the 30th percentile) of the U-index distribution among all firms announcing a buyback in a given year. The rows labeled "Low analyst coverage", "High analyst coverage", and "Low – High analyst coverage" refer to a partition of the sample based on the number of analyst EPS forecast available for the buyback firm from the IBES database at the time of the buyback announcement. A firm belongs to the "Low analyst coverage" ("High analyst coverage") group if its analyst coverage is below the sample median. The cumulative abnormal returns in the rows labeled "High U-index", "Low U-index", and "High – Low U-index" are obtained by running the Ibbotson (1975) RATS method separately for buyback announcements in the "High U-index" and "Low U-index" groups, and then combining the estimated monthly abnormal returns to obtain cumulative abnormal returns. The same approach is followed for the "Low analyst coverage"-"High analyst coverage" case. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. This test statistic corresponds to the one used by Peyer and Vermaelen (2009), with the difference that in this case the standard errors account for clustering around buyback firm nation and announcement calendar month. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix, plus U.S. announcements over the same period. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table 9 Long-Run Returns and Undervaluation – cont'd

Months relative to ann. date	One-factor model				Three-factor model				Four-factor model			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
A. Non-U.S. buybacks												
High U-index	13.29***	30.99***	40.18***	45.01***	7.72***	19.05***	24.94***	30.66***	7.43***	19.06***	25.27***	30.63***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low U-index	7.21***	17.01***	23.34***	27.30***	4.41***	10.74***	14.85***	17.80***	4.64***	11.07***	15.37***	18.61***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low U-index	6.08***	13.98***	16.83***	17.72***	3.31*	8.31***	10.09***	12.86***	2.79	8.00***	9.90***	12.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)
Low analyst coverage	11.88***	25.26***	35.36***	42.72***	7.82***	16.71***	24.25***	31.30***	8.08***	17.28***	24.94***	31.55***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High analyst coverage	8.51***	19.19***	28.47***	34.96***	5.33***	11.88***	16.62***	21.20***	6.01***	12.77***	17.52***	22.24***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low – High analyst coverage	3.38**	6.07**	6.89**	7.76**	2.49*	4.83**	7.63***	10.10***	2.07	4.51**	7.41***	9.32***
	(0.03)	(0.01)	(0.02)	(0.02)	(0.08)	(0.01)	(0.00)	(0.00)	(0.14)	(0.02)	(0.00)	(0.00)
B. U.S. buybacks												
High U-index	10.20***	33.85***	48.83***	58.18***	6.09**	22.47***	31.14***	34.60***	10.87***	27.88***	36.43***	40.03***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low U-index	6.29***	17.57***	31.59***	38.86***	4.48***	10.06***	17.04***	19.72***	5.84***	11.79***	18.53***	21.95***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low U-index	3.91	16.28***	17.24***	19.32***	1.61	12.42***	14.09***	14.88**	5.04*	16.08***	17.90***	18.08***
	(0.16)	(0.00)	(0.00)	(0.00)	(0.55)	(0.00)	(0.00)	(0.01)	(0.06)	(0.00)	(0.00)	(0.00)
Low analyst coverage	6.82***	22.66***	40.48***	52.44***	4.16***	12.96***	24.01***	29.43***	6.61***	15.90***	26.33***	32.31***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High analyst coverage	5.86***	17.08***	28.85***	34.34***	3.61***	9.25***	13.89***	15.31***	6.06***	11.99***	16.53***	18.50***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low – High analyst coverage	0.96	5.58**	11.62***	18.10***	0.55	3.72*	10.12***	14.12***	0.56	3.91**	9.80***	13.81***
	(0.53)	(0.01)	(0.00)	(0.00)	(0.68)	(0.07)	(0.00)	(0.00)	(0.65)	(0.03)	(0.00)	(0.00)

Table 10 Long-Run Returns and Takeover Targets
The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method. In panel A, the sample excludes U.S. buybacks, in panel B, it focuses on U.S. buybacks. In both panels, the results are based on U.S. dollar returns, and regional factor models for the expected returns. Both panels report estimates of the cumulative abnormal returns over horizons spanning 12, 24, 36, and 48 months following the buyback announcement date, using one-, three-, and four-factor models. The rows labeled "Takeover target", "Not takeover target", and "Target – Not target" refer to a partition of the sample based on whether the buyback firm is the target of a takeover attempt, or delists, within three years from the buyback announcement. The cumulative abnormal returns in the rows labeled "Takeover target", "Not takeover target", and "Target – Not target" are obtained by running the Ibbotson (1975) RATS method separately for buyback announcements in the "High completion rate" and "Low completion rate" groups, and then combining the estimated monthly abnormal returns to obtain cumulative abnormal returns. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. This test statistic corresponds to the one used by Peyer and Vermaelen (2009), with the difference that in this case the standard errors account for clustering around buyback firm nation and announcement calendar month. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Months relative to ann. date	One-factor model				Three-factor model				Four-factor model			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
A. Non-U.S. buybacks												
Takeover target	13.61***	31.62***	37.74***	42.71***	9.46***	23.46***	25.94***	30.51***	9.82***	23.66***	24.90***	26.39***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	10.14***	21.99***	31.80***	38.91***	6.49***	14.07***	20.39***	26.29***	6.91***	14.75***	21.28***	27.14***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	3.48	9.63*	5.94	3.80	2.98	9.39	5.55	4.23	2.91	8.90	3.62	-0.74
	(0.33)	(0.05)	(0.31)	(0.54)	(0.43)	(0.10)	(0.42)	(0.56)	(0.43)	(0.12)	(0.61)	(0.92)
B. U.S. buybacks												
Takeover target	10.24***	29.68***	59.22***	68.53***	8.46***	20.57***	40.60***	42.57***	11.06***	23.67***	42.91***	45.62***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	5.28***	18.08***	31.69***	40.46***	2.56***	8.66***	15.07***	18.51***	4.95***	11.49***	17.59***	21.56***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	4.97***	11.60***	27.54***	28.06***	5.90***	11.91***	25.52***	24.07***	6.11***	12.18***	25.33***	24.06***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table 11Changes in Risk Exposure around the Buyback Announcement

The table reports the distribution of the estimates of the loadings on the market factor (columns (1)- (2)) from the one-factor model, the SMB factor (columns (3) and (4)), the HML factor (columns (5) and (6)) from the three-factor model, and the UMD factor (columns (7) and (8)) from the four-factor model, before and after the buyback announcement, for each buyback firm. The estimates are obtained as follows. For each buyback firm i, the following one-factor model is estimated:

$$R_{it} - R_{ft} = \alpha_{i,\text{Before}} D_{it} + \alpha_{i,\text{After}}(1 - D_{it}) + \beta_{i,\text{Before}} D_{it}(R_{mt} - R_{ft}) + \beta_{i,\text{After}}(1 - D_{it})(R_{mt} - R_{ft}) + \varepsilon_{it}$$

where D_{it} is an indicator variable equal to 1 if calendar month t precedes the buyback announcement month (i.e. months -36 to -1 relative to the announcement month), 0 otherwise (i.e. months 0 to +36 relative to the announcement month), and R_m and R_f are the market return and the riskfree rate of return. The coefficient estimates for each buyback firm are then stored, and the table describes their distribution. Analogous regressions are estimated for the case of three- and four-factor models. All models are estimated on U.S. dollar returns, using regional factor models. The row labeled "% decreasing after buyback" reports the percentage of buyback announcements where a decrease in risk exposure (market, SMB, HML, or UMD beta) is observed following the buyback announcement. The row labeled "% significant decrease" reports the percentage of cases where the observed decrease is statistically significant at the 5% level or less. The sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix (i.e. excluding U.S. announcements). Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

	One-Factor Market Beta		Three-Factor SMB Beta		Three-Factor HML Beta		Four-Factor UMD Beta	
	Before	After	Before	After	Before	After	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean estimate	0.9577	0.9225	0.6831	0.5728	0.2647	0.1545	-0.0132	-0.0810
Standard deviation	0.7486	0.6437	1.1426	1.0178	1.3738	1.1310	1.0539	0.7520
Min	-0.8449	-0.7790	-2.4958	-2.5116	-4.3934	-3.6024	-3.5918	-3.1998
Percentile 25	0.4855	0.5026	0.0438	-0.0174	-0.3418	-0.4174	-0.4472	-0.3917
Median	0.8631	0.8508	0.5566	0.4920	0.3219	0.1949	-0.0295	-0.0300
Percentile 75	1.3050	1.2642	1.1985	1.0544	0.9169	0.7534	0.3840	0.2785
Max	3.9927	3.6554	4.6941	4.5567	4.3683	4.1849	3.5930	2.4050
% decreasing after buyback	53.8%		53.7%		51.8%		50.8%	
% significant decrease	6.3%		4.5%		5.2%		4.3%	

Table 12 Long-Run Returns and Quality of Corporate Governance

The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method. In panel A, the sample excludes U.S. buybacks, in panel B, it focuses on U.S. buybacks. Both panels report estimates of the cumulative abnormal returns over horizons spanning 12, 24, 36, and 48 months following the buyback announcement date. The rows labeled "High CGQ index", "Low CGQ index", and "High – Low index" refer to a partition of the sample based on the CGQ corporate governance index (the index is described in the appendix). A given firm belongs to the "High CGQ index" ("Low CGQ index") group if its CGQ index is above the 50th percentile, or median (below the median) of the CGQ index distribution among all firms announcing a buyback. The cumulative abnormal returns in the rows labeled "High CGQ index", "Low CGQ index", and "High – Low CGQ index" are obtained by running the Ibbotson (1975) RATS method separately for buyback announcements in the "High CGQ index" and "Low CGQ index" groups, and then combining the estimated monthly abnormal returns to obtain cumulative abnormal returns. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. This test statistic corresponds to the one used by Peyer and Vermaelen (2009), with the difference that in this case the standard errors account for clustering around buyback firm nation and announcement calendar month. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Months relative to ann. Date	One-factor model				Three-factor model				Four-factor model			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
A. Non-U.S. buybacks												
High CGQ index	8.11***	16.20***	23.10***	25.41***	6.44***	11.44***	16.60***	17.86***	6.95***	12.44***	17.75***	18.82***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low CGQ index	8.49***	15.82***	20.62***	26.61***	3.88***	7.36***	9.43***	13.33***	4.63***	8.03***	10.70***	15.88***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low index	-0.39	0.39	2.48	-1.20	2.56	4.08	7.17*	4.54	2.32	4.41	7.05*	2.94
	(0.86)	(0.89)	(0.48)	(0.77)	(0.26)	(0.22)	(0.08)	(0.33)	(0.28)	(0.16)	(0.06)	(0.51)
B. U.S. buybacks												
High CGQ index	5.20***	17.78***	28.72***	35.96***	2.77***	9.05***	13.25***	15.99***	4.40***	10.78***	14.98***	18.28***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low CGQ index	7.89***	20.23***	33.31***	41.02***	4.99***	11.28***	17.80***	21.15***	6.94***	13.49***	19.87***	23.80***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low index	-2.69**	-2.45	-4.59**	-5.06**	-2.22**	-2.23	-4.55**	-5.16***	-2.53**	-2.71	-4.88**	-5.51***
	(0.02)	(0.13)	(0.01)	(0.01)	(0.03)	(0.16)	(0.01)	(0.01)	(0.02)	(0.10)	(0.01)	(0.00)

Table 13 Long-Run Returns and Country-Level Corporate Governance Quality

The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method. In all panels, the results are based on a sample including buyback announcements from all countries (including the United States). In panel A, the sample is split based on the level of the repurchasing firm's country's GovernanceMetrics index. In panel B, the sample is split based on the Loderer et al. (2010) index. Both panels report estimates of the cumulative abnormal returns over horizons spanning 12, 24, 36, and 48 months following the buyback announcement date, based on U.S. dollar returns and regional factors. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. This test statistic corresponds to the one used by Peyer and Vermaelen (2009), with the difference that in this case the standard errors account for clustering around buyback firm nation and announcement calendar month. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Months relative to ann. Date	One-factor model				Three-factor model				Four-factor model			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
A. GovernanceMetrics Index												
High GovMetrics index	9.45***	23.04***	37.10***	47.73***	7.21***	17.63***	28.00***	36.58***	7.57***	18.10***	28.14***	36.40***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low GovMetrics index	10.89***	21.80***	27.96***	31.93***	5.87***	11.39***	14.42***	18.47***	6.06***	11.57***	15.04***	19.08***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low index	-1.44	1.24	9.14**	15.80***	1.34	6.25**	13.58***	18.11***	1.52	6.53***	13.09***	17.31***
	(0.46)	(0.65)	(0.01)	(0.00)	(0.43)	(0.01)	(0.00)	(0.00)	(0.38)	(0.00)	(0.00)	(0.00)
B. Loderer et al. (2010) Index												
High Loderer et al. (2010) index	10.36***	25.05***	40.81***	51.82***	8.00***	18.98***	30.78***	39.51***	8.24***	19.26***	30.61***	38.88***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low Loderer et al. (2010) index	10.35***	20.25***	26.65***	30.32***	4.25***	8.51***	10.31***	13.77***	4.68***	8.83***	11.13***	14.91***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low index	0.01	4.80	14.15***	21.50***	3.75**	10.46***	20.46***	25.75***	3.56**	10.44***	19.48***	23.97***
	(0.99)	(0.12)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)

Table 14 Long-Run Returns and Board and Shareholder Approval

The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method. The sample excludes U.S. buybacks, and reports estimates of the cumulative abnormal returns over horizons spanning 12, 24, 36, and 48 months following the buyback announcement date. The rows labeled "Board approval", "Shareholder approval", and "Board – Shareholder approval" refer to a partition of the sample based on whether board or shareholder approval is required to announce the buyback. The countries in which board approval is sufficient are: Australia, Canada, India, Israel, New Zealand, Switzerland, Taiwan, and Thailand. Shareholder approval is required in all other countries in the sample. The cumulative abnormal returns in the rows labeled "Board approval", "Shareholder approval", and "Board – Shareholder approval" are obtained by running the Ibbotson (1975) RATS method separately for buyback announcements in the "Board approval" and "Shareholder approval" groups, and then combining the estimated monthly abnormal returns to obtain cumulative abnormal returns. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. This test statistic corresponds to the one used by Peyer and Vermaelen (2009), with the difference that in this case the standard errors account for clustering around buyback firm nation and announcement calendar month. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Months relative to ann. Date	One-factor model				Three-factor model				Four-factor model			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
Board approval	10.67***	25.52***	40.61***	51.52***	8.50***	20.02***	32.07***	41.44***	8.73***	20.29***	31.83***	40.84***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Shareholder approval	10.02***	20.39***	26.77***	31.38***	5.24***	10.72***	13.54***	17.47***	5.62***	11.35***	14.69***	18.72***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Board – shareholder approval	0.65	5.13*	13.84***	20.14***	3.26*	9.30***	18.53***	23.97***	3.11*	8.94***	17.13***	22.12***
	(0.75)	(0.08)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)

Table 15 Firm-level Long-run Returns – Cross-sectional regressions

The table reports the estimates of a cross-sectional regression of firm-level long-run returns on the various determinants of long-run performance considered in the preceding tables. For each buyback announcement, the long-run returns are measured over a period of 36 months subsequent to the announcement date, as the four-factor risk-adjusted return in the spirit of Brennan et al. (1998). For a given stock in a given calendar month, the four-factor risk-adjusted return is computed as the risk-free rate of return plus the residual from a regression of the stock's excess returns on the excess market return, size, book-to-market, and momentum factors over the entire 1998-2011 period. The risk-adjusted returns are then averaged over the 36-month period following the buyback announcement date, obtaining the risk-adjusted (average) monthly returns used in the regressions reported in the table. The table reports the estimates of regressions of the long-run performance measure on the determinants of long-run performance. In columns (1)-(4), the sample is restricted to the ex-U.S. buybacks. In columns (5)-(8), the sample is extended to include U.S. buybacks. All regressions include announcement year indicators (they coefficients are not reported for brevity). In all specifications, the t-statistics are based on standard errors clustered around nation and announcement month. In all panels, the sample consists of open-market repurchase announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix, plus U.S. buyback announcements over the same period. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table 15 Firm-level Long-run Returns – Cross-sectional regressions – cont'd

	Excluding U.S. buybacks				Including U.S. buybacks			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
U-index	0.056*	0.064*	0.066**	0.076**	0.059*	0.070**	0.072**	0.082**
	1.68	*1.93*	*1.99*	*2.31*	*1.79*	*2.12*	*2.19*	*2.52*
× U.S.					-0.020	-0.029	-0.032	-0.041
					-0.33	*-0.50*	*-0.54*	*-0.69*
Analyst coverage	-0.011**	-0.006	-0.007*	-0.008	-0.015***	-0.010**	-0.012***	-0.008
	-2.46	*-1.34*	*-1.66*	*-1.45*	*-3.40*	*-2.29*	*-2.59*	*-1.46*
× U.S.					0.017***	0.013**	0.014**	0.010
					2.91	*2.12*	*2.33*	*1.52*
CGQ	0.448***	0.542***	0.465***	0.403**	0.513***	0.570***	0.494***	0.454***
	2.77	*3.42*	*2.92*	*2.32*	*3.16*	*3.63*	*3.12*	*2.66*
× U.S.					-0.586***	-0.641***	-0.566***	-0.524***
					-3.03	*-3.40*	*-2.98*	*-2.61*
GMI	0.090***				0.074***			
	4.42				*3.63*			
× U.S.					-0.014			
					-0.32			
Change in beta	0.001	0.002	0.002	0.002	0.001	0.002	0.002	0.002
	0.52	*0.58*	*0.55*	*0.55*	*0.51*	*0.58*	*0.55*	*0.56*
× U.S.					-0.001	-0.001	-0.001	-0.001
					-0.45	*-0.52*	*-0.49*	*-0.50*
Takeover target (Y/N)	0.029	0.071	0.047	0.062	-0.074	-0.027	-0.062	-0.018
	0.19	*0.45*	*0.30*	*0.39*	*-0.47*	*-0.17*	*-0.40*	*-0.11*
× U.S.					1.194***	1.150***	1.184***	1.141***
					5.54	*5.36*	*5.50*	*5.32*
Loderer index		1.388***				1.417***		
		5.48				*5.43*		
× U.S.						0.573		
						0.68		
Board approval			0.382***				0.384***	
			5.16				*5.18*	
× U.S.							-0.121	
							-0.39	
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indicators for missing CGQ data, Missing Loderer et al. index	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
U.S. buyback indicator	No	No	No	No	Yes	Yes	Yes	No
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nation indicators	No	No	No	Yes	No	No	No	Yes
R²	0.014	0.018	0.016	0.036	0.036	0.038	0.037	0.043
N. Obs.	6144	6144	6144	6144	15162	15162	15162	15162

Figure 1 Sample Breakdown by Legal Origin
The chart reports a breakdown of the sample by announcement year and legal origin. Each bar represents the number of open-market repurchase announcements per year. Different colors are used for announcements by firms from countries with different legal origin: French, German, and Scandinavian civil law, and English Common law (LaPorta et al., 1998, Djankov et al., 2007, Siems, 2007). The numbers above each bar report the total number of buyback announcements in the corresponding year. The sample consists of open-market buyback announcements, over the period 1998-2008, by non-U.S. firms from the 31 countries listed in the appendix. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets, as described above.
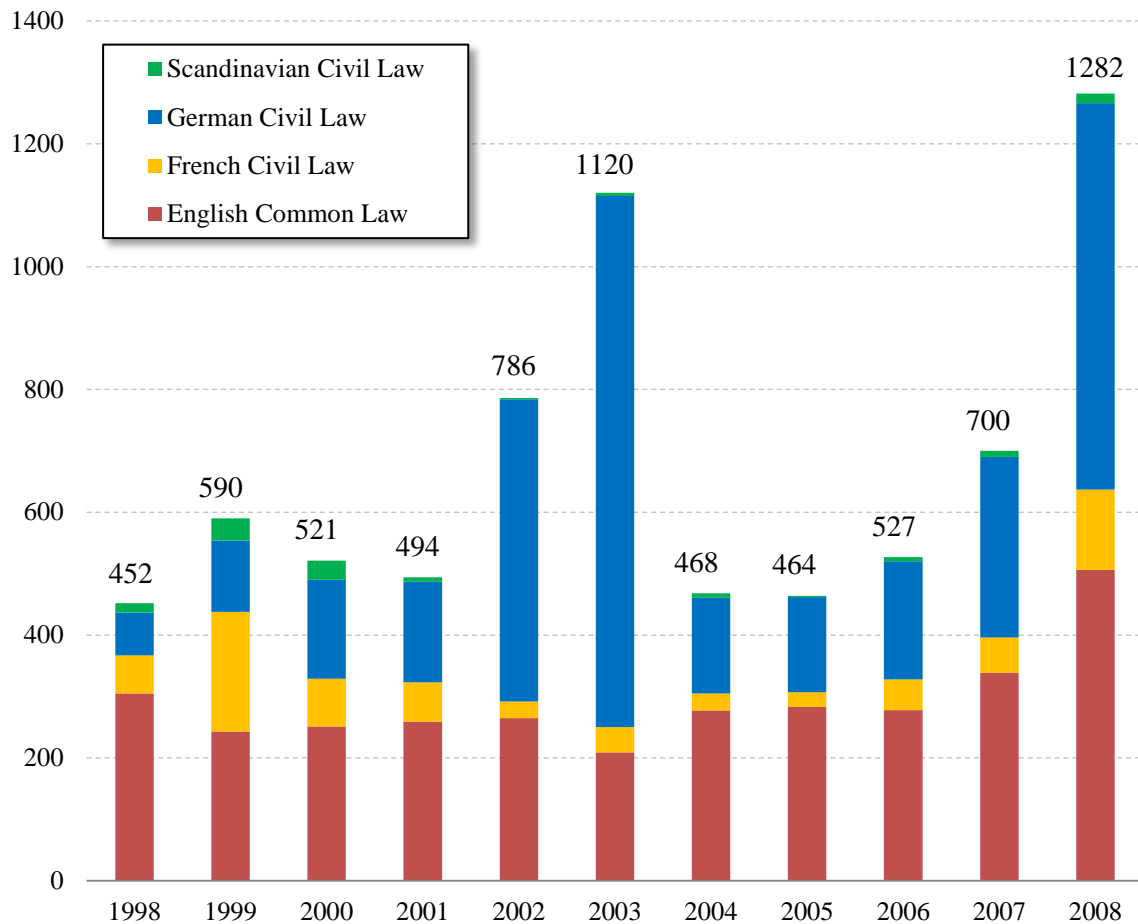
Figure 2 Announcement Returns

In panel A, the graph plots the cumulative average abnormal return around the buyback announcement date, for buybacks around the world excluding the U.S. (solid line), and separately for the U.S. buybacks (dashed line). In panel B, ex-U.S. buybacks are split between buybacks from board approval and shareholder approval countries. The vertical axis is rescaled in panel B to facilitate reading the graph. In both panels, on a given day and for a given buyback stock, the abnormal return is defined as the difference between the stock return and the return on the market index. The sample consists of open-market buyback announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix, plus the U.S. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

A. U.S. and Non-U.S. Buybacks

B. Non-U.S. Buybacks, Board and Shareholder Approval
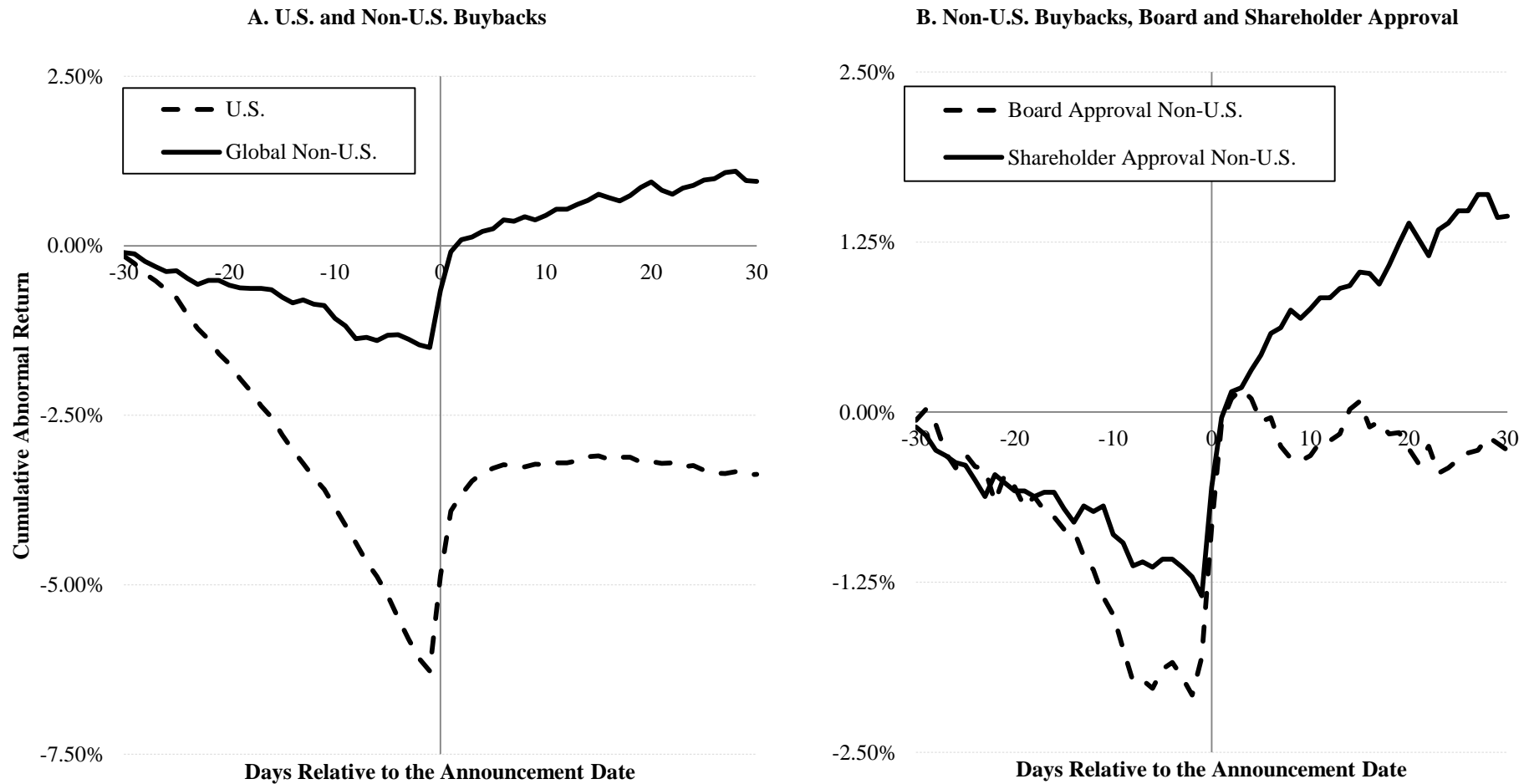
Figure 3 Long-Run Returns, by Region

The figure plots the cumulative abnormal return over the period (-6,+48) months relative to the announcement date. The monthly abnormal returns are obtained using Ibbotson's (1975) RATS method combined with the four-factor model, and are estimated separately for buyback announcements by firms in the four Fama and French (2012) regions, separating out U.S. buyback announcements. The sample consists of open-market buyback announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix, plus U.S. buyback announcements over the same period. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.
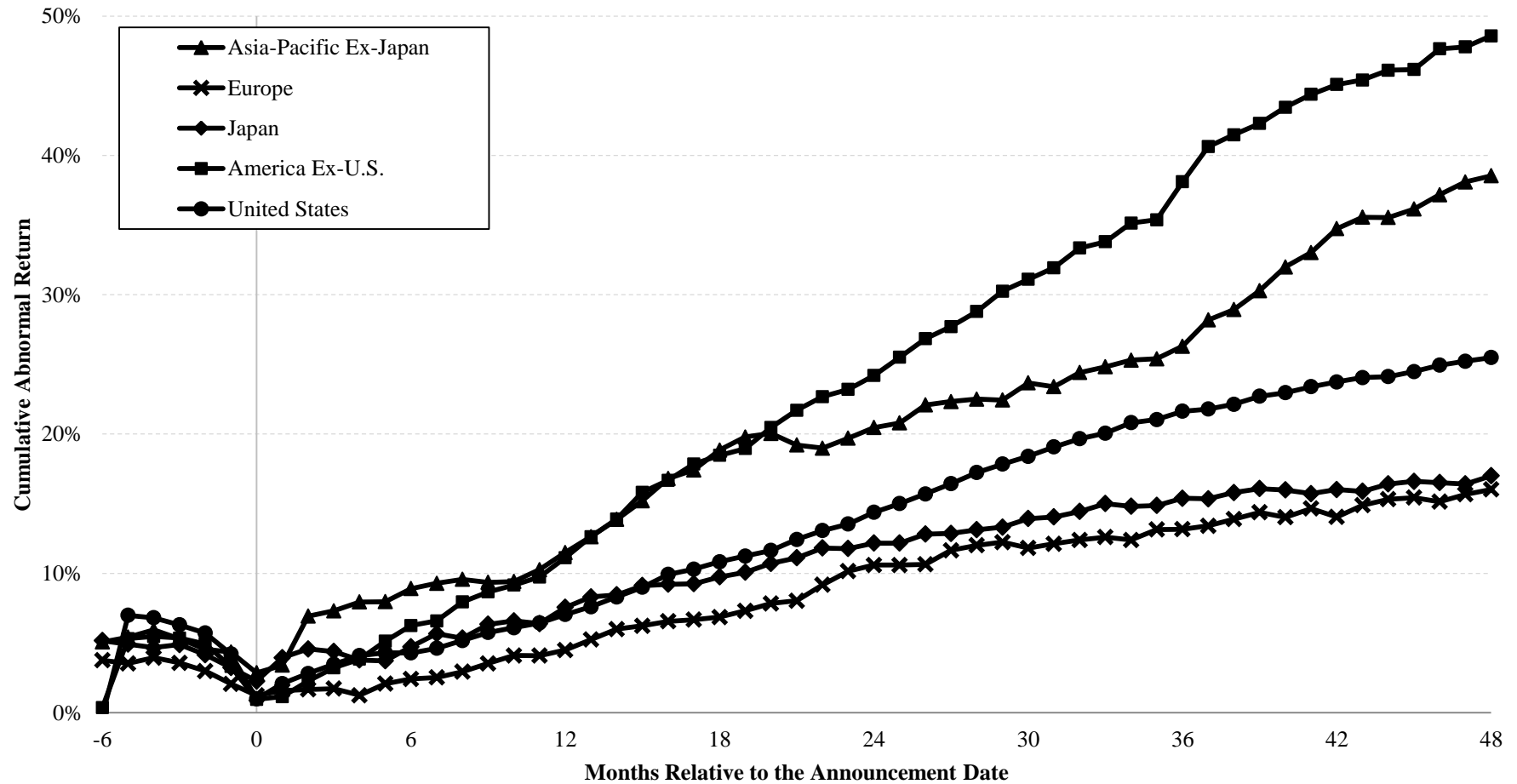
Figure 4 Analyst EPS Foreasts Revisions Prior to the Buyback announcement

The graph illustrates analyst EPS forecast revisions over the six-month period prior to the buyback announcements, for buyback firms in the "High U-index" and "Low U-index groups" defined above and in the text. For each buyback firm and month t relative to the announcement date, the analyst forecast revision $(EPS(t) - EPS(0))/P(0)$ is calculated, where $EPS(t)$ the average one-year-ahead EPS forecast in a given month t relative to the announcement month ($t = 0$ denotes the announcement month itself), and $P(0)$ the stock price in the announcement month. The graph plots the average forecast revision across firms with high/low U-index. Analyst EPS forecasts are retrieved from the IBES international database. Only non- U.S. firms are included.

Months Relative to the Announcement Date
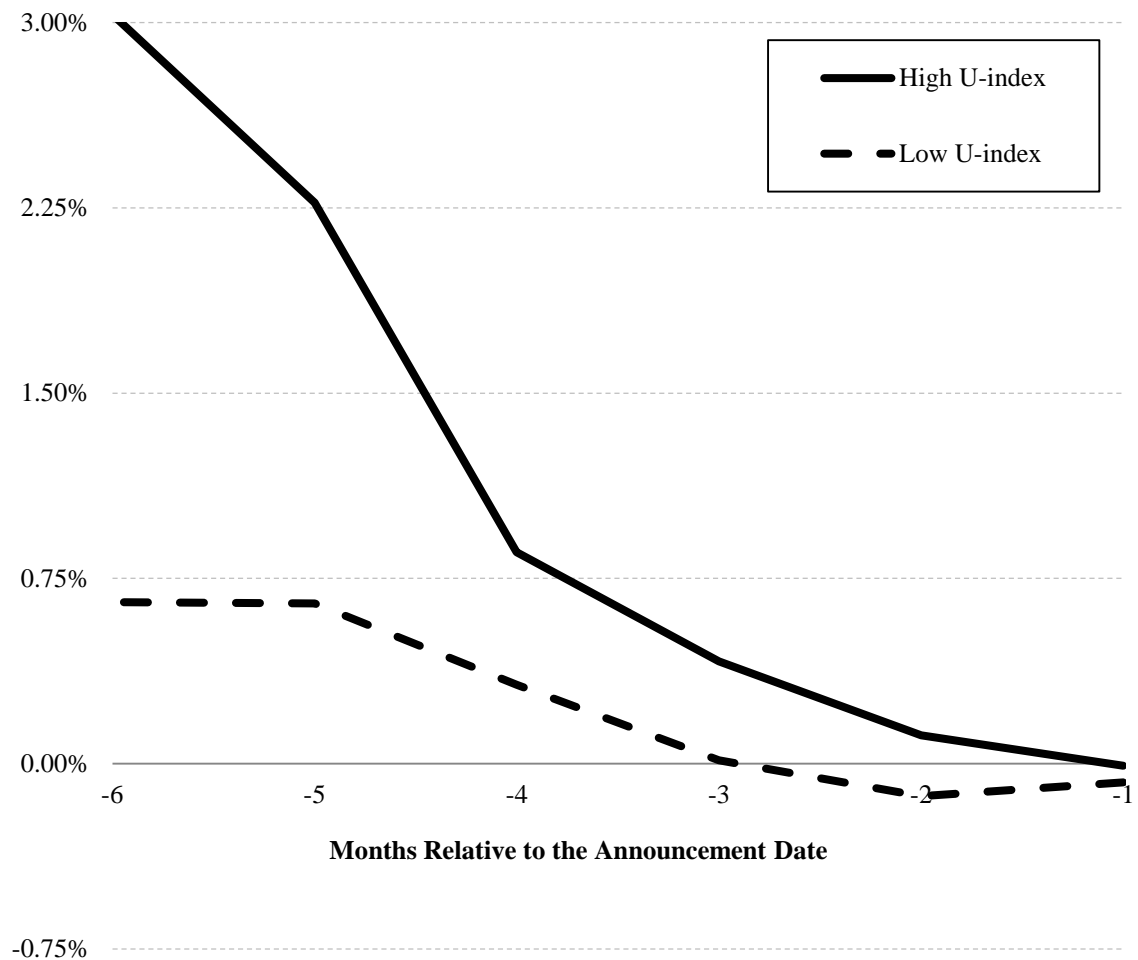
Figure 5 Announcement month distribution
The graph plots the distribution of buyback announcements by calendar month, across buybacks announced by firms from shareholder approval countries, board approval countries (excluding the U.S.), and the U.S. The sample consists of open-market buyback announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.
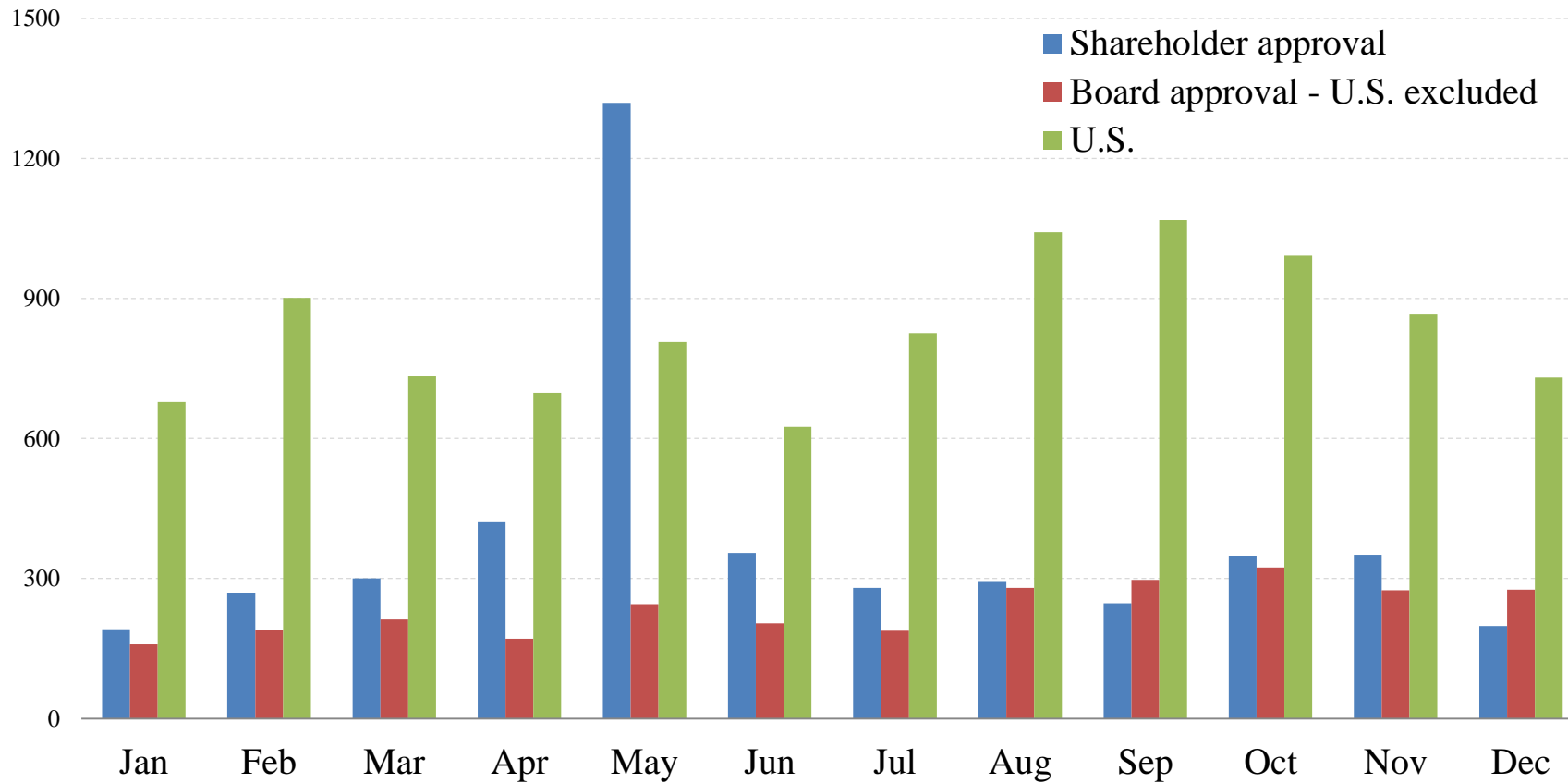
Table A.1 Returns Prior to the Buyback Announcement and Corporate Governance Quality

The table reports the cumulative long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method,over horizons spanning 12, 24, and 36 months prior to the buyback announcement date. In columns (1)-(3), the sample excludes U.S. buyback announcements; in columns (4)-(6), it is restricted to U.S. buybacks. In each sample partition (Non-U.S. and U.S.), the rows labeled "High CGQ index", "Low CGQ index", and "High – Low index" refer to a partition of the sample based on the CGQ corporate governance index (the index is described in the appendix). A given firm belongs to the "High CGQ index" ("Low CGQ index") group if its CGQ index is above the 50th percentile, or median (below the median) of the CGQ index distribution among all firms announcing a buyback. The cumulative abnormal returns in the rows labeled "High CGQ index", "Low CGQ index", and "High – Low CGQ index" are obtained by running the Ibbotson (1975) RATS method separately for buyback announcements in the "High CGQ index" and "Low CGQ index" groups, and then combining the estimated monthly abnormal returns to obtain cumulative abnormal returns. For each horizon, factor model, and sample partition, the table reports the estimate of the cumulative abnormal return, as well as the p-value from the associated chi-square test statistic. Repurchase announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Horizon	Non-U.S.			U.S.		
	Low CGQ	High CGQ	High - Low	Low CGQ	High CGQ	High - Low
	(1)	(2)	(3)	(4)	(5)	(6)
(-6,-1)	-0.791	-0.208	0.583	-5.786***	-6.132***	-0.346
	(0.41)	(0.82)	(0.64)	(0.00)	(0.00)	(0.58)
(-12,-7)	0.087	2.821**	2.734*	3.171***	2.920***	-0.251
	(0.93)	(0.01)	(0.05)	(0.00)	(0.00)	(0.70)
(-24,-13)	3.768***	3.640***	-0.128	10.170***	10.060***	-0.110
	(0.01)	(0.01)	(0.95)	(0.00)	(0.00)	(0.92)
(-36,-25)	3.501***	6.029***	2.528	9.319***	8.327***	-0.992
	(0.01)	(0.00)	(0.17)	(0.00)	(0.00)	(0.38)
(-12,-1)	-0.704	2.613**	3.31**	-2.615***	-3.212***	-0.597
	(0.44)	(0.03)	(0.02)	(0.00)	(0.00)	(0.21)
(-24,-1)	3.064	6.253***	3.189	7.555***	6.848***	-0.707
	(0.15)	(0.00)	(0.24)	(0.00)	(0.00)	(0.93)
(-36,-1)	6.565***	12.282***	5.717*	16.874***	15.175***	-1.699
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.39)

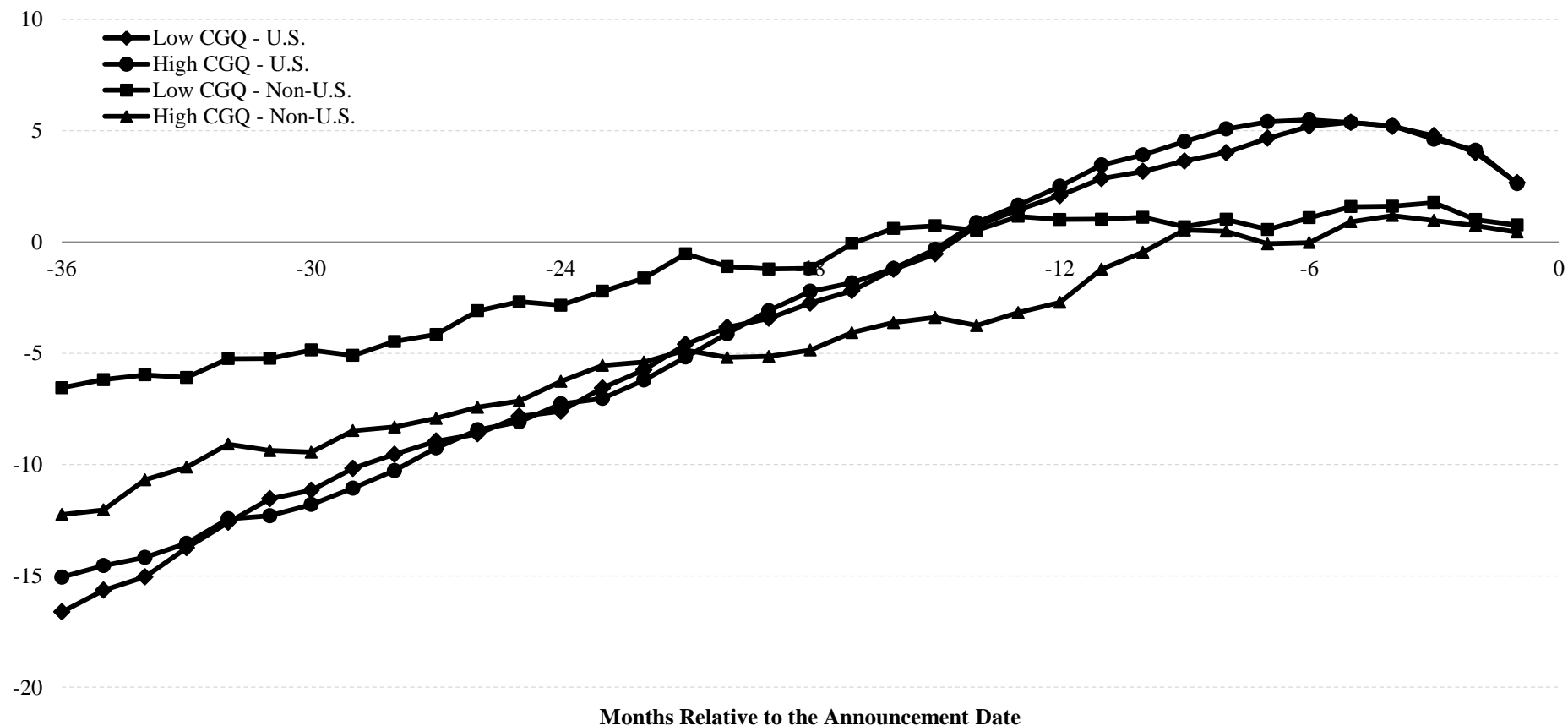**Months Relative to the Announcement Date**

Figure A.1 Cumulative Abnormal Returns Prior to the Buyback Announcement and Quality of Corporate Governance
The figure plots the cumulative abnormal return over the period (-36,-1) months relative to the announcement date, for U.S. and non-U.S. buyback announcements, split into portfolios based on the quality of their corporate governance, measured based on their CGQ index. The monthly abnormal returns are obtained using Ibbotson's (1975) RATS method combined with the four-factor model. The sample consists of open-market buyback announcements, over the period 1998-2008, by non-U.S. firms, from the 31 countries listed in the appendix, plus U.S. buyback announcements over the same period. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

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