Buybacks Around the World

Market Timing, Governance and Regulation

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Abstract

We document the consequences of open market share repurchases in a global setting, using over 20,000 announcements from 32 countries. Non-U.S. buybacks are associated, on average, with smaller announcement returns, and larger long-term excess returns. Governance quality matters: both short term and long term excess returns are positively related to country governance quality. The hypothesis that managers buy back shares to take advantage of an undervalued stock price explains long run returns around the world: long term returns are positively related to an undervaluation index (Peyer and Vermaelen, RFS 2009). In contrast to U.S. buybacks, however, they are unrelated to subsequent takeover activity or takeover risk. We also find strong evidence that long run excess returns in the U.S. are partly driven by the benefits from a reduction in agency costs of free cash flow. Finally, shareholders are better off when the buyback only requires board approval, rather than shareholder authorization, suggesting that the insistence of e.g. European regulators on shareholder approval as a tool for shareholder protection from buybacks is misplaced.

Share repurchases have become increasingly common, in the U.S. as well as around the world. Every year since 1998, approximately 10% of all U.S. listed firms announced a buyback program. While this percentage is larger than in many other countries, since the late 1990s changes in regulation have liberalized share repurchases and greatly increased their popularity in the rest of the world. This "buyback wave" has attracted much attention in the financial press, and has been criticized for undermining economic growth, leading firms to skimp on long term investment in order to pursue short term objectives such as earnings per share (e.g. The Economist (2014), Rieder (2015), Luce (2014)). This criticism is inconsistent with the research on U.S. buybacks showing that buybacks benefit long term shareholders (Ikenberry, Lakonishok, and Vermaelen (1995), Peyer and Vermaelen (2009), Dittmar and Field (2015)). In light of the emergence of buybacks outside the U.S., does this conclusion hold up in an international setting, or are the concerns voiced in the press justified?

We address this question by analyzing a sample of more than 20,000 buyback announcements, from the U.S. as well as 31 developed and emerging markets, over the period 1998-2010. We look at the research question from two complementary angles. First, we ask to what extent the conclusions of the literature on U.S. buybacks are robust in a global sample, focusing on possible explanations for the long-run abnormal returns following buyback announcements. Second, we relate buybacks to the quality of corporate governance, as well as regulation designed to protect shareholders against buybacks that could hurt their long term interests.

Past research shows that in the U.S. open market share repurchase authorization announcements are accompanied by positive announcement returns of about 2-3% and positive long-run abnormal returns over four years ranging from 8% (Ikenberry, Lakonishok and Vermaelen (1995)) in the eighties to 24% (Peyer and Vermaelen (2009)) in the nineties. These results are consistent with a variety of non-mutually exclusive explanations, which can be grouped under two broad hypotheses: *undervaluation* and *agency cost.*

The undervaluation hypothesis posits that firms buy back their stock when they are temporarily undervalued. Stock prices increase after buybacks as the market corrects the undervaluation, at least in the long run. This hypothesis focuses on *when* companies buy back stock, rather than *why*, and applies to any situation in which the company acts to protect its long term shareholders, e.g. to reduce dilution from employee stock option programs (Kahle (2002), Weisbenner (1999) and Jolls (1998)), reach a target capital structure (Dittmar (2000), Dittmar and Dittmar (2008)), substitute dividends to create more financial flexibility (Jagannathan, Stephens and Weisbach (2000)), or take advantage of the option to buy back stock from uninformed outside

investors (Ikenberry and Vermaelen (1996)). In other words, open market buybacks take place when they benefit (or at least do not hurt) long term shareholders, i.e. when the stock is undervalued (or at least not overvalued), and they need not reflect a deliberate attempt to signal undervaluation (as argued by e.g. Vermaelen (1981), Oded (2005), Bhattacharya and Jacobsen (2013), Massa, Rehman and Vermaelen (2007)).[1]

None of these hypotheses predicts long term excess returns. The only variant of the undervaluation hypothesis that does is the market timing hypothesis: companies buy back stock to benefit long term shareholders at the expense of selling shareholders. Such a strategy requires markets to underreact to the buyback authorization announcement (Ikenberry, Lakonishok and Vermaelen (1995), Peyer and Vermaelen (2009)), or to the actual repurchase following the buyback authorization (Dittmar and Field (2015)). This is consistent with survey evidence from Brav, Graham, Harvey, and Michaely (2000), who show that 86% of managers agree with the proposition that firms repurchase stock when it is undervalued.

The agency cost hypothesis argues that buybacks, by returning cash to the shareholders, mitigate the agency costs of free cash flow (e.g. Grullon and Michaely (2004)), and stock prices increase because the market is relieved that bad managers do not waste excess cash.[2] This hypothesis assumes that board members and other large investors put enough pressure on managers to pay out excess cash. Indeed, good managers are expected to pay out excess cash, or at least not waste it, so when they do buy back stock, the market should not be positively surprised. Hence abnormal returns should be higher in firms with low corporate governance quality. It also predicts that excess returns should be explained by actual buyback activity, i.e. the stock price rises only if and when the company returns cash to the shareholders. In contrast, the market timing hypothesis makes no such prediction: firms that try to take advantage of an undervalued stock price may not even complete the buyback, if the market becomes efficient before completion.

Most of the extant evidence on share buybacks focuses on the U.S. Do these findings and arguments generalize to non-U.S. markets? In particular, the long term excess returns are anomalous. As Fama (1998) points out, one way to test whether an anomaly is real or the result of chance is to examine it in a completely different data set – such as an international one. Huang and Lin (2014) argue that the buyback anomaly has disappeared in the U.S. recent years, while Dittmar and Field (2015) show the opposite result, but using actual repurchase data (which became available on a monthly basis since 2004 in the U.S.). Although we re-examine

[1] Such signaling strategy seems more appropriate for buybacks with a large price impact such as tender offers (Vermaelen (1984)).
[2] Corporate tax savings have also been identified as a driver of share buybacks.

the U.S. results, the focus of this paper is on non-U.S. buybacks. While there are country-specific studies that examine the consequences of buybacks in non-U.S. countries,[3] this is the first paper that provides an integrated approach using an identical methodology and time horizon for 32 countries.

A more fundamental challenge to the buyback anomaly is that the excess returns might really be compensation for risk. Bargeron, Bonaime, and Thomas (2014) and Lin, Stephens, and Wu (2014) argue that long term "excess" returns compensate for takeover risk, and that the anomaly disappears once this risk is controlled for, with a takeover factor in the spirit of Cremers, Nair, and John (2009). The interesting question is whether this takeover explanation survives in an international sample. As the U.S. is the most active takeover market in the world, one would expect lower abnormal returns in non-U.S. countries if excess returns are simply compensation for takeover risk.

Our global approach also provides a unique laboratory to test for the relevance of agency costs by looking at corporate governance, as corporate governance practices and quality vary much more across an international sample than within the U.S. (e.g., La Porta et al. (2000)). 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 benefit more from the reduction in agency costs of free cash flow. On the other hand if firms repurchase shares for good as well as bad reasons, we expect a positive relation between corporate governance quality and returns. Bad reasons include fighting a takeover bid by repurchasing shares from "pessimistic" shareholders (Billet and Hui (2007)), 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, particularly when the firm has concentrated ownership (as in most European countries, e.g. Faccio and Lang (2002)). This argument is similar to Ellis, Moeller, Schlingemann, and Stulz (2011) who find that the quality of corporate governance is positively related to bidder returns around acquisition announcements. Similar to buybacks, acquisitions can be done for good and bad reasons, and high governance quality firms are more likely to make value increasing acquisitions. What makes buybacks different from mergers is that a repurchase reduces agency costs of free cash flows in firms with *low* governance quality. Hence, the relation between buybacks and corporate governance quality is ambiguous, and therefore an empirical question.

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[3] See e.g. Sweden (Rasbrant (2013)), Hong Kong (Firth and Yeung (2005)), U.K. (Crawford and Wang (2012) and Korea (Park and Jung (2005)).

The fact that buybacks can be motivated by good and bad reasons is also a concern of regulators. Around the world, two approaches to buyback regulation prevail (Kim, Schemper, and Varaya (2005)).[4] The first approach, followed in the U.S. but also in Australia, Canada, India, New Zealand, Taiwan, and Thailand, leaves management considerable flexibility, and only requires board approval to announce a share buyback. The second approach, followed in the rest of the world, requires the explicit approval of the shareholder assembly, with the stated aim to protect shareholders against buybacks driven by value-destroying motives.[5] If the regulation is effective, buybacks in shareholder approval countries will generate larger excess returns than in board approval countries, ceteris paribus. Whether shareholders should have more power than boards is the topic of an intense debate (see e.g. Bebchuk and Weisbach (2009)). Although there is evidence that boards do not always serve long term shareholders (e.g. Bebchuk (2013)), in the case of buyback authorizations, giving shareholders decision power may be counterproductive, as it reduces managerial flexibility to take advantage of undervaluation. Moreover, announcement returns may be lower in shareholder approval countries if the announcement simply reflects a routine request for a buyback authorization at the annual shareholders meeting, not a signal of undervaluation or an attempt to reduce agency costs. A shareholder approval requirement may also make it more difficult for firms to respond to requests by activist shareholders to pay out excess cash. We thus also address the question: are shareholders better off as a result of regulation that insists that shareholders approve buybacks?[6]

Our main findings are as follows. Non-U.S. buybacks generate positive announcement returns, but the magnitude of the market reaction is smaller than in the U.S. (1.42% versus 2.18%). The difference is explained by differences in the quality of corporate governance and in regulation. Buybacks in countries with higher average governance quality (measured by legal origin (La Porta et al (1998)), GovernanceMetrics International®, and the Loderer et al. (2010) index) have higher announcement returns. The *firm*-level ISS Corporate Governance Quotient is also associated with higher announcement returns, but only outside the U.S.

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[4] Also see e.g., Cook, Krigman, and Leach (2003) on "safe harbor" regulation in the spirit of the SEC rule 10b-18 in the U.S.

[5] 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).

[6] 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 (Kim, Schemper and Varaya (2005)). It is not obvious whether these regulations have a material impact on short term and long term returns after buybacks. Hence our focus on one regulation, i.e. whether shareholders or board approval is necessary.

One interpretation is that in non-US countries buybacks can be driven by good and bad reasons, but reduction in agency costs of free cash flows is not a significant motivation of low governance quality firms. Agency cost reduction requires pressure from large shareholders and activists, which may not be as prevalent outside the U.S. The lack of a significant relation between corporate governance quality and U.S. stock returns may simply illustrate the ambiguity discussed above: as arguments can be made that governance quality is good and bad for stock returns, investors may well choose to ignore governance quality, at least in the short run.

However, focusing on short-term announcement returns may be inappropriate if it takes time for markets to fully digest the impact of governance quality on stock returns. Therefore, we test whether long-term excess returns are related to corporate governance quality. Consistent with our analysis of short term announcement returns, long term returns are positively related to *country-level* corporate governance quality. However, *firm*-level governance quality is significantly related to long term returns only in the U.S., where firms with better governance experience *smaller* excess returns. In other words, outside the U.S., the combined short term and long term results support the existence of a positive relation between corporate governance quality and buyback returns. In the U.S., the overall picture is consistent with the hypothesis that the shareholder value gains from buybacks are at least partially driven by benefits from the reduction in agency costs of free cash flow.

We also find significantly higher short term as well as long-term excess returns in countries under "board approval" regulation. Thus, requiring investors to approve buybacks does not increase shareholder value, possibly because the buyback announcements reflect routine requests for buyback authorizations and the regulation reduces managerial flexibility. This finding suggests that, rather than protecting the shareholders, the "shareholder approval" regulation is largely ineffective.

Open market buybacks globally generate significant, positive long term excess returns. Using the calendar-time (Fama (1998)) and Ibbotson's (1975) RATS long term event study methodologies, and one-, three- and four-factor models, we find statistically significant positive long term returns in the 20-30% range over 48 months following the buyback announcement.

In addition, there are large differences across regions: for instance, long term returns are smaller in Europe than in other regions, and insignificant when we use the calendar time method. This result is not surprising, as many European countries have poor corporate governance quality and require shareholder approval. The global results are largely consistent with the U.S. results of Peyer and Vermaelen (2009). We find

the largest long term returns for firms that have been downgraded by analysts prior to the buyback announcement, with lower analyst coverage, and with the highest Peyer-Vermaelen (2009) undervaluation index (U-index). A number of robustness checks suggest that these findings are not subsumed by changes in systematic risk exposure (Grullon and Michaely (2004)), and that while exposure to takeover risk can account for at least part of the long term returns in the U.S. (Bargeron, Bonaime, and Thomas (2014), Lin, Stephens, and Wu (2014)), it is largely irrelevant in other markets.

Combined with the earlier literature, our results provide evidence of significant market under-reaction to buybacks in the U.S. going back 35 years, as well as outside the U.S. since 1998. Why does such an anomaly persist? Why don't investors learn and respond more enthusiastically to buyback announcements? Indeed, average announcement returns have not changed during the last 35 years and remain around 2-3%. 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, a strategy that may seem too risky to institutional investors.

The remainder of the paper is organized as follows. In section I we describe our data. Section II reports our analysis of short term announcement returns. Section III discusses our methodology and results on long-run returns. Section IV concludes.

I. Data

We collect a sample of open-market share repurchase announcements from the SDC Mergers and Acquisitions and Repurchases databases. Stock price and accounting data are obtained from Datastream and Worldscope for non-U.S. firms, and from CRSP and Compustat for U.S. firms. We restrict the sample to announcements made between 1998 and 2010. 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 repurchase worldwide.[7] We exclude going private transactions by requiring that the percentage of shares sought for the buyback is less than 50%. We focus on the

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[7] Over the sample period, SDC reports a few hundred non-open market buybacks, largely privately negotiated.

31 non-U.S. nations with at least 30 buyback announcements reported in SDC in the sample period.[8] This results in a buyback sample of 9,034 announcements from the 31 non-U.S. countries, plus 11,096 announcements from U.S. firms. Our sample period ends in 2010 to allow studying 4-year post-announcement returns, consistent with prior literature (Ikenberry, Lakonishok and Vermaelen (1995) and Peyer and Vermaelen (2009)).

We focus on announcements of buyback *authorizations* and long term returns, rather than short term trading profits around *actual* buyback activity. There is a large literature measuring whether companies can buy back shares at discounts from market prices over short horizons (Dittmar and Field (2015) and Bonaime, Hankins and Jordan (2014) in the U.S., McNally, Smith and Barnes (2006) in Canada, Brockman and Chung (2001) in Hong Kong and Zhang (2002) in Japan). We consider these more as tests of broker execution quality, not of fundamental misvaluation.[9]

Table I reports a country breakdown of the sample. The country with the largest number of announcements outside the U.S. is Japan (3,037), the one with the smallest number is Singapore (24). On average, firms outside the U.S. seek to buy back 7.7% of their outstanding shares, while U.S. firms seek 9.2%. Country averages vary between 4.9% (Taiwan) and 13.1% (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 potentially relevant difference across countries could be buyback completion rates. For instance, the market reaction to buyback announcements could be smaller, to the extent that shareholders do not expect

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[8] Data availability reduces the number of announcements in our sample to below 30 for Belgium, Greece, and Singapore; see Appendix C. 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 focused on individual countries, and collecting information based on local news and stock exchange information.

[9] For example, when Synaptics in its August 2014 10Q disclosed that since 2005 it repurchased 19 million shares at an average price of $27, more than 200% below its August 2014 stock price, we assume that the management was not concerned with the fact that during some months they were buying above or below the closing price during the month. Since 2005, the company beat the S&P 500 by 500%, which explains why their repurchasing activity has turned out to be a good investment for long term investors. The argument against using buyback authorizations (instead of completions) is that not all buybacks are completed (Stephens and Weisbach (1998)). But the fact that a buyback authorization was not completed does not mean it was a false signal or a manipulation attempt in the first place. A company can decide not to complete a buyback because its stock becomes fairly valued (the market becomes efficient) or it has a better investment opportunity (i.e. the excess cash is no longer excess cash, so that agency costs of free cash flow disappear). Evidence of such strategic buyback execution is provided by Ikenberry, Lakonishok and Vermaelen (2000): Canadian firms that repurchase no shares during the first year after the buyback authorization earn excess returns of 12% during that year, but zero excess returns afterwards. The opposite pattern is observed when firms complete at least 30% of the program during the first year: they earn insignificant excess returns in year 1 but statistically significant positive returns in year +2 and +3.

the firm to exercise the option to repurchase. Table II reports completion rates, defined as the percentage of the announced buyback that is actually completed (see the Appendix A and D). Outside the U.S., the average completion rate after 1 (2) year(s) is 28% (40%). For U.S. firms, we find 75% and 85%, respectively. The fact that completion rates outside the U.S. are approximately 50% lower may be due to some buyback announcements being routine requests to extend buyback authorizations at the shareholders' meeting in countries where shareholder authorization is required. There are also large differences across countries: Indonesia and Japan have the lowest completion rates, with only 17% and 18% completed after 1 year; Mexico and Israel have the highest, with respectively 72% and 83%.

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. (42%) are from firms from a German civil law country – mostly driven by Japan; 46% are from English common law countries; 9% from French civil law countries; and 2% 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 three "peak" years – 2003, 2008, and 2009 with more than 1,000 announcements outside the U.S. each.

II. Buybacks and Short Term Announcement Returns

We start by analyzing the market reaction to buyback announcements. First, we ask whether shareholders view a buyback announcement as positive news, consistent with U.S. evidence. Second, we ask whether the announcement returns are related to the quality of corporate governance and differences in regulation. We estimate cumulative abnormal (market-adjusted) returns for 3-day (-1,+1), 5-day (-2,+2), and 7-day (-3,+3) intervals around the announcement date.[10] For robustness, we also compare the announcement

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[10] We also estimate the abnormal returns as the difference between the stock return and the predicted stock return from a market model, omitted for brevity. 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) correction for thin trading, obtaining, again, qualitatively similar results. For the market return we use the Datastream indexes for each country, with the exception of the U.S., where we use the CRSP market index.

returns in each country to a bootstrapped distribution of U.S. announcement returns based on a sample of identical size. [11]

Table III shows that the average abnormal announcement return of the overall sample of buybacks outside the U.S. is 1.42% over the (-1,+1) window, 1.59% over the (-2,+2) window and 1.72% over the (-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 2.15% (2.11%, 2.02%). There are 15 countries with significantly (at the 5% level) positive CAR (-1,+1) and 9 with a CAR (-1,+1) higher than the U.S. No country has significantly negative announcement returns, regardless of the event window.

Figure 2, panel A, 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). In contrast to the negative pre-announcement returns of -6% observed in the U.S., pre-announcement returns in non-U.S. countries are closer to zero. Panel B shows that the smallest (in absolute terms) pre-announcement and announcement returns are observed in the shareholder approval countries, consistent with the hypothesis that these announcements are more likely to be routine requests to buy back stock, not managerial responses to bad news creating undervaluation – we discuss this issue in greater detail below.

A. Country level analysis

In Table IV we test whether differences in governance quality at the country level can explain country-average cross-sectional differences in announcement returns. If buybacks can be driven by good or bad reasons, we expect a positive relation between governance quality and returns. However, if announcement returns are driven by perceived benefits from agency cost reductions, the announcement returns will be higher in countries with worse governance quality, because in these countries a share repurchase to reduce excess cash is a more positive surprise. We consider three measures of country-level governance: legal origin, the GovernanceMetrics International® (GMI) index, and the Loderer et al. (2010) index.

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[11] For each nation in our sample having *n* announcements, we randomly select a sample of *n* U.S. open-market repurchases, and compute the average U.S. announcement returns. 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 CAR to the distribution of bootstrapped U.S. CAR. The sample of U.S. repurchase announcements used in the bootstrap procedure is the universe of U.S. buybacks used in this study. 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 for brevity.

In Panel A of Table IV we show average CAR (-1,+1) for firms in the four different legal origins. Results are qualitatively similar whether we include or not U.S. buybacks. Including the U.S., we find average CARs of 1.60% in English common law countries, while Scandinavian (1.28%), German (1.46%), and French (0.45%) 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 IV, we show regressions using various proxies for governance quality at the country level.[12] Regressions (1)-(4) exclude the U.S., (5)-(8) include the U.S.; the results are qualitatively similar. Focusing on results that exclude the U.S., consistent with the univariate statistics in Panel A, the average announcement returns are significantly lower in French civil law countries compared to the English legal origin countries. Using the GovernanceMetrics International® (GMI) or Loderer et al. (2010) indexes, we also find a positive association between governance quality and average announcement returns. A unit increase of the GMI increases the country-average CAR (-1,+1) by 0.49% (the index varies between 0 and 10). Compared to the average CAR of about 1.42%, this seems economically meaningful: 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 0.20. 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 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. Both findings suggest that buybacks create more shareholder value in countries with better governance. 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. 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 1.32%, significant at the 1% level. One interpretation is that buyback announcements in

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[12] In each regression we include the following 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. For brevity we do not show these regression coefficients, but they are available upon request.

shareholder approval countries are routine requests and therefore have very little information content. Evidence of this can be seen in Figure 3, which shows the distribution of the announcements per month, for 3 sub-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 especially driven by Japanese firms that most often have their shareholder meetings in May, and use the meetings to obtain or renew buyback authorizations.

Table V, panel A, shows a strong positive correlation (above 0.8) between board approval and the GMI and Loderer indexes. Hence countries with board approval are high quality governance countries. However, in spite of this correlation, the regressions in Table IV show that after adjusting for governance quality, board approval has still a significant impact on stock returns.

B. Firm level analysis

In Table VI we report the estimates of firm-level regressions using the announcement return measured in the (-1,+1) window. We include both country-specific as well as firm-specific proxies for the quality of governance. The first three regressions of Table VI 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).[13] In the non-U.S. sample, the CGQ index is associated with a significantly higher announcement return. This result is consistent with the country-level results of Table IV: governance is positively related to returns. However, this is not the case in the U.S.: in regressions (3)-(4) the CGQ coefficient is not significantly different from zero. One interpretation is that investors in non-U.S. countries depend on the quality of governance to assess whether a buyback is made for good reasons and that agency cost reductions are not a major perceived benefit from the buyback. In the U.S. there is no such unambiguous relationship::agency cost reductions are a major driver of U.S. buybacks by low quality governance firms and this effect offsets the otherwise positive relation between returns and governance quality. A final explanation may be the fact the short-term market reaction is

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[13] This measure of governance is available for U.S. and 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. The CGQ index is only available for a subset of the repurchasing firms in our sample, covering 1,502 announcements outside the U.S. and 1,860 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.

incomplete, i.e. the market underreacts to the corporate governance quality. In that case it makes sense to also examine the relation between long term returns and corporate governance quality, as we do in the next section.

In the regressions of Table VI, we control for the relevance of other explanatory variables proposed in the literature. Consistent with the hypothesis that managers respond to undervaluation by buying back stock, we find a negative association between announcement returns and the return prior to the buyback announcement as well as size. However, unlike in the U.S., the book-to-market ratio of firms outside the U.S. is insignificantly related to CAR. The percentage sought is positively related to announcement returns, but only significantly in the U.S. sample. One explanation is that in many non-U.S. countries the percentage that can be repurchased 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. [14] Hence there is very little information content in the percentage of shares sought in non-U.S. buybacks. Also, unlike in the non-U.S. sample, U.S. companies with high dividend payout ratio experience lower excess returns. This result is consistent with the relevance of agency cost reduction as an explanation for U.S. announcement returns: firms with high dividend payout have lower agency costs of free cash flow.

C. Inferences

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

III. Buybacks and Long-run returns

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

In this section, we first test whether firms outside the U.S. exhibit similar positive long run abnormal return patterns as documented in Ikenberry, Lakonishok, and Vermaelen (1995), and Peyer and Vermaelen (2009). We then test whether these abnormal returns can be explained by subsequent takeovers or takeover risk as argued by Bergeron et al. (2014) and Lin et al. (2015). Next, we test if they are explained by the market overreacting to recent bad news as proposed by Peyer and Vermaelen (2009), or if the market overestimates the risk of cash flows as argued by Grullon and Michaely (2004). Finally, we re-examine the consequences of governance quality and regulation on long term returns. In other words, are the findings of Table IV and Table VI confirmed or contradicted in the long run? If markets are efficient, we would expect no relation between long term returns and governance quality or regulation. So these tests are implicitly a test of market underreaction to regulation and governance.

A. Methodology

Our sample spans 32 countries as listed in Table I. 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 U.S. dollar long term returns using the calendar-time (Fama (1998)) and Ibbotson (1975) Returns Across Time and Securities (RATS) methods,[15] combined with Fama and French's (2012) 'global' and 'regional' factor models, for regions Asia-Pacific Ex-Japan, Europe, Japan, and North America.[16,17]

In the calendar-time portfolio approach, each calendar month, an equally-weighted portfolio is formed, including all the firms that made a repurchase announcement in the previous 12 months (or 24, 36, 48 months

[15] We use U.S. dollar returns to take the perspective of a U.S. investor, as well as to facilitate comparisons with the previous literature. The results are qualitatively similar if we use local currency returns (omitted for brevity). 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), Karolyi 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 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.

[16] Fama and French (2012) argue that factor models applying to multiple countries are only adequate to the extent that there is integration across the different markets, and Griffin (2002) finds that global factor models can result in large pricing errors. This suggests the global factors might be inappropriate for our tests. On the other hand, country-specific factor models would have to be based, for many countries in our sample, on factors constructed from a small number of stocks, thus leading to less precise estimates. The regional factors are thus a good compromise, and for this reason we base most of our tests on them. Hou, Karolyi, and Kho (2011) conclude that separate local and non-U.S. 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 comparisons 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).

[17] 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 North America Ex-U.S. region, Israel to Europe, and China, India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand to Asia-Pacific Ex-Japan.

depending on the horizon). 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. We validate these estimates using a bootstrap procedure on the U.S. buybacks analogous to the one used for the announcement returns.

The Ibbotson (1975) RATS methodology involves running, for each month after the announcement date, cross-sectional regressions over the buyback firms sample:

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

where i denotes a given firm, n a given region, 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 the standard errors, as the 48 equations in (2) are jointly estimated as a system of Seemingly Unrelated Regressions (SUR), with standard errors clustered around nation and announcement year (Petersen (2009)).[18] A final benefit of the RATS approach is that, unlike the calendar-time approach, it allows pooling 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.

B. Long-run returns after buyback announcements: baseline results

Tables VII and VIII, and Figure 4, show long-run abnormal returns following the repurchase announcements using the calendar-time and RATS methodologies respectively. In both tables, Panel A shows the results with one-, three-, and four-factor models for the non-U.S. and U.S. buybacks samples. Regardless of

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[18] 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.

the factor model and the investment horizon, the non-U.S. alphas are always significantly positive at the 1% level and range from 0.42% to 0.76% per month (calendar time; the cumulative RATS alphas reported in Table VIIIA are consistent in terms of their magnitudes and significance). Panel B breaks down the non-U.S. sample into the four Fama and French (2012) regions. All regions show statistically significant (at the 5% level or less) alphas over all horizons and factor models, except Europe, where the returns are smaller in magnitude and not always significantly different from zero. This European exception is not due to outliers: none of the individual European countries, except Sweden, shows significant positive excess returns using three- or four-factor models (results available upon request). Regardless of the time horizon and factor model, U.S. and overall non-U.S. buybacks are always followed by statistically significantly positive excess returns. However, using comparable factor models and horizons, with the calendar time method the U.S. excess return are generally smaller than the results reported by the non-U.S. sample.

Regardless of the estimation approach (calendar time or IRATS), we find significant positive long run excess returns following buyback announcements both in the U.S. as well as the non-U.S. samples. Although based on different methodologies and samples, the results shown here are consistent with long run positive returns reported in Sweden (Rasbrant (2013)), Hong Kong (Firth and Yeung (2005)), U.K. (Crawford and Wang (2012)) and Korea (Park and Jung (2005)). For the remainder of the paper, we employ the RATS method to be able 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.

C. Can takeovers or takeover risk explain the buyback anomaly?

A number of authors have related share repurchases to takeover activity. Billiet and Hui (2007) find that open market share buybacks are more likely if the firm has a higher takeover probability. Their conclusion is that buybacks deter takeover bids, possibly because the company gets rid of shareholders not interested in control (Bagwell 1991) or because they reduce agency costs of free cash flow (Hirshleifer and Thakor (1992)). Bargeron, Bonaime and Thomas (2014), on the other hand, based on a U.S. sample, find that long-run abnormal returns are mainly due to the fact that some firms are taken over after the buyback. Hence, firms that successfully deter a takeover bid will not experience long term positive excess returns.

Table IX 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). In our buyback sample, we classify 12.6% of all firms as targets, 19.2% of all U.S. firms and only 5.3% of all non-U.S. firms (the U.S. frequency is similar to the 26.6% reported by Lin et al. (2014)). Each panel of Table IX reports excess returns based on a different factor model. Panel A, B and C show the results for the one-, three- and four-factor models we employed so far. When we exclude U.S. firms, we find that the differences in long-run excess returns between firms that are taken over after the buyback and other firms are all small and insignificant, regardless of the factor model and the investment horizon.

When focusing on U.S. buybacks, firms that become takeover targets have larger long run returns. However, the fact that the non-targets (which represent 80% of our sample) also earn significant excess returns of 19.28% after 48 months (panel C) suggests that takeover bids alone cannot explain the outperformance. The fact that a significant fraction of the U.S. abnormal return after buybacks is due to subsequent takeovers does not necessarily invalidate the idea that managers are timing the market: when a company buys back stock because it believes it is undervalued, it is not surprising that its competitors or other bidders have the same opinion and are interested in making a takeover bid. Indeed, undervaluation can be corrected in two ways: by new information or by a subsequent takeover bid.

Bargeron, Bonaime and Thomas (2014) and Lin, Stephens and Wu (2014) give a different twist to the takeover hypothesis, by arguing that companies that announce buybacks have higher takeover risk and therefore should have higher expected returns according to the five-factor model of Cremers, Nair and John (2009). Using a different U.S. sample and time period, they find that excess returns disappear after adjusting for takeover risk.

In order to test whether the excess returns are a compensation for takeover *risk,* we augment the four-factor model with the takeover factor proposed by Cremers et al. (2009) and re-estimate long term excess returns. For the U.S. sample we use the data construction methodology of Cremers et al. (2009). For non-U.S. buybacks we replicate the Cremers et al. (2009) takeover factor for each of the Fama-French regions (America ex-U.S., Asia-Pacific Ex-Japan, Europe and Japan). The takeover factor is the return on an equally weighted portfolio that is long in the top quintile of firms with high takeover probability and short in the bottom quintile of firms with low takeover probability.[19]

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[19] In Cremers et al. (2009) the takeover likelihood is estimated by a logit model of the probability that a given firm is a takeover target, including explanatory variables such as size (log of market value of equity), Tobin's Q, leverage, log Cash,

The results are shown in Panel D of Table IX. In the U.S. sample, compared to the four-factor model, introducing the takeover factor significantly reduces the abnormal returns (48 month horizon) of buyback firms that were subsequently taken over by 9.7%. A similar reduction is observed in the sample of firms that were not subsequently taken over. The fall in excess returns is consistent with the hypothesis that takeover risk to some extent is priced in U.S. markets, but this risk factor fully explains excess returns (as claimed by Bargeron et al. (2014) and Lin et al. (2014)). The risk premium should be independent of actual takeovers occurring, as pointed out by Cremers et al. (2009), but this is not the case in our sample: buyback firms that are subsequently taken over experience four year excess returns that are 17.7% higher than other buyback firms. However, this result is consistent with the hypothesis that buyback stocks were undervalued, and that bidders took advantage of the undervaluation. Put differently, markets underestimate the probability that some buyback stocks will be taken over. Furthermore, introducing the takeover factor has no impact on the excess returns of non-U.S. firms, so long-run excess returns outside the U.S are inconsistent with the hypothesis that long-run excess returns are determined by either actual takeover activity or takeover risk. Indeed, in spite of the lack of takeover activity, long run excess returns are not smaller in non-U.S. countries than in the U.S.

Bargeron et al. (2014) as well as Lin et al. (2014) find that long term excess returns after U.S. buybacks disappear after including the takeover factor, while in our sample they don't. Reasons for the difference could be differences in the time period covered as well as methodology. For example Bargeron et al. (2014) cover the period 1980-2010 and use the calendar time method. They report an average monthly excess return (using the four factor model *without* the takeover factor) of only 0.15% per month, or 1.76% per year, much smaller than the numbers reported in this paper. Note that the calendar time methodology gives the same weight to a calendar month with 100 buyback announcements (not uncommon during the 1998-1999 period) and a month with 5 buyback announcements (not uncommon in the 1980s). Other explanations could be differences in the takeover factor. For all the years prior to 2005, our U.S. takeover factor was provided by Martijn Cremers, and for the remaining years we employ the method specified in Cremers et al. (2009). Lin et al. (2014) use a different method to calculate the takeover factor and for the common period in our sample (1998-2004), the correlation between their and our takeover factor is 43%. Using their takeover factor in our sample and

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PPE to assets, ROA, industry activity measured by the frequency of takeovers in the previous year, industry indicators, and an indicator for the presence of a blockholder. For the non-U.S. sample, we estimate the same model but, due to data availability, we replace the blockholder indicator by the percentage of voting rights held by the largest shareholder. We discuss the construction of this factor, and how we identify buyback firms that become takeover targets, in the Appendix E.

employing the RATS methodology, the four-year excess return is 13.30%. When we use the calendar time method, we find a monthly alpha of 45 bps, or 5.54% annualized (t-stat: 3.52; similar results obtain when using the takeover factor of Bargeron et al. (2014)).[20]

D. Market timing and long term returns

In this section, we test for two interpretations of the market timing hypothesis: firms buy undervalued stock because they believe the market has overreacted to bad news or they buy back stock because the market is overestimating risk.

The *overreaction hypothesis* is based on Peyer and Vermaelen's (2009) finding that beaten up small value stocks tend to outperform after the buyback. Value, size and prior return are combined to construct an undervaluation index (U-index) for each buyback announcement, following 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.[21] Table X 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, the factor-model and whether the buyback is announced by a non-U.S. firm (Panel A) or a U.S. firm (panel B), high U-index portfolios always outperform low U-index portfolios. Thus, the international evidence supports the conclusions based on U.S. data. Table X also shows that, based on three factor or four factor models, firms with lower analyst following significantly outperform those with more analysts over 48 months by approximately 6% (panel A: excluding U.S. firms) and 10% (panel B: U.S. firms).[22] However, even firms with high analyst following experience significantly positive long-run abnormal returns. Thus, having a large analyst following does not necessarily mean that managers cannot take advantage of undervaluation.

In order to test for a possible channel by which firms might become underpriced, we test whether firms react by 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 5 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

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[20] We are grateful to Martijn Cremers, Alice Bonaime, and YiLin Wu for providing us with the takeover factor returns data used in their papers.

[21] 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 3 points for each criteria (for a total U-index score of 9).

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

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.

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) and estimate the pre- and post-buyback exposure of buyback firms to the market, size (SMB), value (HML), and momentum (UMD) factors. Table XI 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 hold for the size, value, and momentum factors, also reported in Table XI. 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.

E. Corporate governance and long term returns

As pointed out supra, if long term excess returns are due to a reduction in agency costs of free cash flow, firms with 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. The short run announcement returns reported in Table IV and table VI support the second hypothesis, at least for non-U.S. firms. The results for U.S. companies in Table VI are more or less inconclusive, as we observe neither a positive or negative relation between governance quality and announcement returns. In this section we test whether the market has underreacted to the importance of corporate governance quality.[23]

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[23] Evidence that markets underreact to corporate governance measures is provided by Gompers et al (2003), using a governance measure based on takeover defenses: they 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, any evidence of a positive relation between long term returns and governance quality 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

We analyze long-run returns splitting the sample at the median CQG level. The results are shown in Table XII. Among the non-U.S. firms (Panel A), we find very few significant differences in long-run abnormal returns between high and low CGQ index firms, although, regardless of the factor model and the time horizon, high quality governance firms always have higher long term returns than low quality governance firms and for the 24 and 36 month horizon the difference is statistically significant at the 10% level. At a minimum we can confirm that the long-run returns do not contradict the results of Table VI: for non-U.S. firms the buyback is more beneficial for companies with higher governance quality.

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 factor model or the time horizon. This is strong evidence that reduction in agency costs of free cash flow is 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.

We also repeat our analysis with country level measures of governance quality.[24] In Table XIII we report sample splits based on the GMI and Loderer et al. (2010) indexes, respectively. Across both country level governance variables we confirm the short term results of Tables IV: 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, we find a cumulative abnormal return difference of 13.61% 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.

F. Regulation and long term returns

In Table XIV we show sample splits by whether 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

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worse governance if anything. Thus, it is unlikely that the buyback sample is a self-selected group of good governance firms. In order to test whether this difference between non-U.S. 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 (available upon request) show 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 (Table V) implies that the evidence on market timing and the corporate governance results are truly independent.

[24] In this case, the test is restricted to non-U.S. countries, as there is of course no variation in country-level governance quality *within* the United States.

in shareholder approval countries, again a result that confirms the short-term analysis of Tables IV and VI. We find very economically and statistically significantly higher long-run (48 months) returns of between 20% (one-factor model) to 24% (three-factor model). One interpretation of this result is that shareholder approval leaves less room for timing if managers want to take advantage of repurchasing shares at a low price.

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 often underestimates the importance so that governance and regulatory effects show up in the long run returns as well. The fact that regulators require shareholder approval does not really improve shareholder returns, quite the contrary.

G. Buybacks and long-run returns: recent performance

Fu and Huang (2014), using announcements from 2003 to 2012, show that long term excess returns have disappeared in the U.S. in recent years. Their argument is that the market has become more efficient in recent years, so that managers no longer have inside information. This argument implies that markets have become closer to strong form efficient: had they only become efficient in the semi-strong form, then managers would announce a buyback when they have inside information, but stock prices would increase dramatically after the announcement, and we would observe large positive announcement returns but zero long term excess returns. Clearly this has not happened in recent years: the average abnormal return around buyback announcements is still around 3%, the same as it has been during the last 40 years.

In order to test whether indeed the anomaly has disappeared in recent years, we re-estimate our excess returns using announcements from 2003 to 2010. The results in Table XV show that in the U.S. long-term returns have fallen significantly (more than 15% compared to the results reported in Table VII A), although they have not entirely disappeared, but are still positive and significant at the 5% level over each horizon and for each model specification. The difference in results may be caused by the fact that Fu and Hung (2014) have a smaller sample because they drop buybacks that are announced in the same year as the previous buyback, as well as all repurchases made by financials and utilities. For example, while we find 11,096 buybacks made between 2008 and 2010, they report only 7,181 observations, or 35% less; and in the period 2003-2010 their study is based on 3,773 observations, while we use 6,910 announcements.

Table XV also shows the results for the non-U.S. sample. Here we see no major difference with Table VII A, at least when we focus on the three- and four-factor models. One conclusion from these combined results is that the possibly U.S. market has become more efficient, but that is clearly not the case in other countries. This should be an additional reason for investors to pay more attention to non-U.S. buybacks. Of course, it should be pointed out that this analysis is based on a shorter time period, and that the recent period that includes one of the largest financial crises in history. The traditional call for more future research is important here. In that respect it should be noted that the combined results covering 30 years of buyback announcements (Ikenberry, Lakonishok and Vermaelen (1995), Peyer and Vermaelen (2009), as well as this paper) do not show a systematic declining trend in long term excess returns.

IV. Conclusions

Share buybacks around the world generate significant, positive announcement returns. Moreover, they are followed by statistically significant positive long run excess returns. Long term excess returns are an anomaly in an efficient market, and the fact that this anomaly is global makes it more likely that the U.S. findings are not a result of sample bias. There is also little support for the hypothesis that long term returns following buybacks are compensation for takeover risk – in fact, they are at least as large outside the U.S. as for U.S. buybacks, although the frequency of takeovers is much lower.

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 who do not support the management. Hence, as a first step, investors use country governance quality measures to assess the reason for the buyback.

The hypothesis that managers buy back shares to take advantage of an undervalued stock price explains long run returns around the world. Specifically, we find that long term returns are positively related to measures of undervaluation such as the U-index. However, we also find strong evidence that long run excess returns in the U.S. are partly driven by the benefits from a reduction in the agency cost of free cash flow: the fact that low governance quality firms can benefit more from reductions in agency costs of free cash flow is more important than the concern that these firms also will may buy back stock for the wrong reasons. In non-U.S. firms, on the

other hand, high corporate governance quality is associated with higher short term returns and this conclusion is not changed in the long run. This is consistent with the hypothesis that outside the U.S., the quality of corporate governance has to be high in order to ensure that a buyback is motivated by shareholder value maximization. It also means that in these countries there is less pressure from activist investors to force managers to reduce agency costs of free cash flow.

One additional major finding is the fact that shareholders are better off when the buyback only requires board approval, rather than shareholder authorization. A possible interpretation is that board authorization increases managerial flexibility to time the buyback. 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 curbs managerial flexibility to time 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, North America Ex-U.S., and U.S.). 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 undervalued) to 9 (most 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 and Demirgüç-Kunt (2009)).

Stock market turnover

Stock market turnover for a given nation. The variable is retrieved from the World Bank "Financial Structure" data (Beck and Demirgüç-Kunt (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)). 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 description 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 the relevant variables are available, thus only a subset of the entire open-market repurchase announcements from SDC are used in the analysis. The table illustrates the coverage.

Nation	SDC Announcements	Announcements used	Nation	SDC Announcements	Announcements used
Japan	3168	3037	Netherlands	72	56
Canada	2841	2298	Denmark	67	54
Hong Kong	746	693	Israel	66	24
Australia	647	553	Thailand	65	65
France	413	355	Austria	65	54
Malaysia	282	273	Norway	62	55
Germany	234	210	Sweden	55	48
United Kingdom	205	146	Spain	51	42
South Korea	200	178	Philippines	51	42
Brazil	169	119	New Zealand	50	34
Taiwan	155	133	Indonesia	47	46
China	145	54	Mexico	46	43
India	144	90	Greece	44	27
Switzerland	138	113	Belgium	37	28
Italy	93	84	Singapore	32	24
Finland	77	56			

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 increased in 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 II presents summary statistics about completion rates for the sample countries. On average, the completion rate for buyback programs outside the U.S. 1 year after the announcement date is 28%, increasing to 40%, 52%, and 62%, 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 that announce a repurchase complete the buyback program within one year of the announcement date, about 10% do not appear to repurchase any shares within four years.[25]

E. Identifying takeover targets among buyback firms, and takeover factors

We retrieve all takeover announcements for firms from our sample countries over the 1997-2013 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, 12.6% of our sample firms (5.3% in non-Us countries and 19.2% in the U.S.) are classified as "takeover targets".

In the analysis reported in Table IX (panel D), we augment the four-factor model for stock returns by the takeover factor introduced by Cremers et al. (2009). For U.S. buybacks, we simply use the takeover factor data of Cremers et al. For non-U.S. buybacks, we replicate the Cremers et al. (2009) takeover factor for each of the Fama-French regions (America Ex-U.S., Asia-Pacific Ex-Japan, Europe, and Japan). The takeover factor is based on a portfolio long in stocks that are more likely to be takeover targets, and short in stocks that are less likely. In Cremers et al. (2009), the takeover likelihood is estimated by running a logit model for the probability that a given stock is a takeover target, including explanatory variables size (log of market equity), Tobin's Q, leverage, log cash, PPE-to-assets ratio, ROA, industry activity (whether there were takeovers in a given industry in the previous year), industry indicators, an indicator for the presence of a blockholder, and the interaction between this indicator and the Gompers, Ishii, and Metrick (2003) governance index. We estimate the same model, however, due to data availability, replacing the blockholder indicator by the voting rights of the largest shareholder.

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[25] 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 I
Summary Statistics

The table reports summary statistics on open-market repurchase announcements. 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 1998-2010, 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.	9034	5620	1.6	11	2.4	7.7	4.5	0.1	50.0
United States	11096	4686	2.4	18	9.5	9.2	8.0	0.1	49.9
Region: America Ex-U.S.									
Brazil	119	81	1.5	5	7.8	6.9	5.5	1.5	42.8
Canada	2298	984	2.3	11	5.3	6.5	3.1	0.2	50.0
Mexico	43	34	1.3	2	3.1	5.2	6.0	0.1	25.0
Region: Asia-Pacific Ex-Japan									
Australia	553	356	1.6	7	2.2	9.5	5.2	1.4	47.4
China	54	37	1.5	3	0.8	9.9	3.9	1.0	29.9
Hong Kong	693	565	1.2	3	5.0	9.9	1.6	0.0	22.0
India	90	71	1.3	5	0.4	13.1	7.7	1.7	40.0
Indonesia	46	26	1.8	5	1.0	12.5	5.2	1.9	20.0
Malaysia	273	241	1.1	4	1.8	9.9	0.8	3.4	12.5
New Zealand	34	25	1.4	5	1.9	9.3	10.0	3.5	46.0
Philippines	42	33	1.3	4	1.0	10.3	7.8	0.5	28.8
Singapore	24	21	1.1	3	0.5	9.5	1.7	3.0	10.3
South Korea	178	141	1.3	7	0.7	5.3	2.4	0.4	17.8
Taiwan	133	114	1.2	4	1.0	4.9	2.9	0.4	30.3
Thailand	65	60	1.1	3	1.0	8.8	3.0	1.0	20.0
Region: Europe									
Austria	54	37	1.5	3	2.8	9.0	2.3	0.3	10.2
Belgium	28	19	1.5	3	1.3	9.8	1.9	4.0	14.3
Denmark	54	36	1.5	5	1.2	10.7	9.1	1.0	50.0
Finland	56	39	1.4	6	2.1	6.4	4.0	0.8	28.5
France	355	277	1.3	4	2.2	9.4	4.7	0.6	46.9
Germany	210	166	1.3	6	1.4	9.3	4.1	0.3	50.0
Greece	27	26	1.0	2	0.9	9.3	3.8	4.0	22.0
Israel	24	23	1.0	2	0.7	7.6	2.9	3.5	10.2
Italy	84	74	1.1	3	1.6	8.9	2.9	1.7	20.0
Netherlands	56	38	1.5	4	1.5	7.4	4.9	0.3	25.0
Norway	55	41	1.3	3	1.4	9.0	4.5	2.2	33.5
Spain	42	36	1.2	3	1.2	7.2	8.3	0.1	50.0
Sweden	48	38	1.3	3	0.8	9.3	3.4	2.8	20.0
Switzerland	113	70	1.6	6	2.4	7.7	3.1	0.1	15.2
United Kingdom	146	137	1.1	3	0.4	12.5	8.8	0.3	50.0
Region: Japan									
Japan	3037	1774	1.7	9	4.8	6.8	4.7	0.1	49.8

Table II

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 1998-2010, 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.	28	40	52	62
United States	75	85	89	92
Region: America Ex-U.S.				
Brazil	53	61	69	78
Canada	30	49	65	76
Mexico	72	77	81	88
Region: Asia-Pacific Ex-Japan				
Australia	38	51	68	81
China	47	48	53	58
Hong Kong	20	28	35	42
India	48	56	60	67
Indonesia	17	24	26	37
Malaysia	29	45	57	67
New Zealand	49	49	64	76
Philippines	62	72	72	75
Singapore	54	63	71	95
South Korea	44	48	59	74
Taiwan	40	72	86	97
Thailand	28	31	49	75
Region: Europe				
Austria	30	38	55	66
Belgium	69	72	76	83
Denmark	45	49	56	82
Finland	26	38	47	79
France	25	42	50	82
Germany	39	50	62	72
Greece	70	80	83	88
Israel	83	88	88	89
Italy	42	47	63	74
Netherlands	65	74	79	89
Norway	31	50	59	84
Spain	31	38	51	62
Sweden	21	29	35	48
Switzerland	44	50	62	73
United Kingdom	48	50	66	89
Region: Japan				
Japan	18	25	35	43

Table III 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 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 1998-2010 (the bootstrap procedure is described in detail in the text). The sample consists of open-market repurchase announcements, over the period 1998-2010, 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.	1.42***	17.78	0	1.59***	17.04	0	1.72***	16.02	0
United States	2.15***	26.09	-	2.11***	22.80	-	2.02***	19.98	-
Region: America Ex-U.S.									
Brazil	0.21	0.44	0	0.57	0.85	5	1.40*	1.76	26
Canada	1.95***	10.48	11	2.13***	10.02	55	2.39***	9.84	96
Mexico	-0.06	-0.04	4	0.26	0.16	10	1.10	0.66	29
Region: Asia-Pacific Ex-Japan									
Australia	2.46***	6.71	81	2.39***	6.39	76	2.38***	5.89	79
China	4.54***	4.37	100	3.28***	3.20	93	2.64**	2.06	75
Hong Kong	0.05	0.13	0	0.22	0.52	0	0.54	1.03	0
India	2.79***	3.52	79	2.63***	2.91	70	1.94**	2.02	48
Indonesia	-0.46	-0.62	1	0.32	0.36	10	1.69	1.25	44
Malaysia	0.10	0.33	0	0.50	1.33	0	0.20	0.50	0
New Zealand	3.08***	2.84	75	3.81***	2.85	87	4.34**	2.52	92
Philippines	2.91***	2.65	74	4.15***	3.38	93	4.36***	3.35	95
Singapore	4.26**	2.27	89	3.18*	1.62	71	1.98	1.00	47
South Korea	1.46**	2.38	14	1.28*	1.73	12	1.30	1.54	17
Taiwan	0.75	1.39	1	0.58	0.89	2	0.71	0.96	6
Thailand	3.05***	3.27	82	3.34***	3.74	86	3.20***	2.68	81
Region: Europe									
Austria	1.31*	1.66	24	1.54	1.55	32	1.95**	1.96	46
Belgium	1.33**	1.96	29	1.88**	2.49	45	2.23**	2.20	56
Denmark	2.21***	2.87	52	1.65*	1.90	36	1.55*	1.80	36
Finland	1.45*	1.75	26	0.62	0.70	12	0.87	0.68	22
France	-0.06	-0.27	0	0.26	0.78	0	0.27	0.71	0
Germany	3.09***	5.79	94	3.03***	5.35	93	2.54***	3.80	77
Greece	0.70	0.48	16	1.44	0.90	35	1.33	0.72	35
Israel	1.48	0.67	38	2.50	0.99	60	1.88	0.77	48
Italy	1.04	1.95	11	0.66	1.03	8	1.21*	1.79	23
Netherlands	1.57**	2.22	30	1.88	2.02	44	1.58	1.58	38
Norway	0.36	0.40	5	1.07	1.05	20	1.94	1.33	47
Spain	1.36**	2.07	0	0.62	0.84	0	0.22	0.21	0
Sweden	1.16	1.10	28	1.99	1.54	15	1.78	1.43	13
Switzerland	0.85***	2.64	19	0.98***	2.77	46	1.26***	2.98	43
United Kingdom	0.97*	1.93	5	1.28**	2.00	10	1.58**	2.26	22
Region: Japan									
Japan	1.28***	10.69	0	1.52***	10.47	0	1.63***	9.69	1

Table IV
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.

Panel 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	1.60***	1.28**	1.46***	0.45	2.01***	1.28**	1.46***	0.45
t-test	13.66	2.05	10.97	1.58	29.63	2.05	10.97	1.58
F test – Difference from English common law		0.30	0.67	16.10***		1.37	13.29***	28.89***
p-value		0.58	0.41	0.00		0.24	0.00	0.00
F test – Difference from Scandinavian civil law			0.10	1.70			0.09	1.48
p-value			0.75	0.19			0.77	0.22
F test – Difference from German civil law				12.21***				10.59***
p-value				0.00				0.00

Table IV Announcement Returns – Country Level – cont'd

Panel B. Cross-sectional Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Scandinavian legal origin	-0.0136				-0.0139*			
	-1.70				*-1.74*			
German legal origin	-0.0040				-0.0087			
	-0.52				*-1.60*			
French legal origin	-0.0215***				-0.0227***			
	-3.32				*-3.54*			
GovernanceMetrics International® index		0.0049***				0.0027***		
		5.75				*2.92*		
Loderer et al. (2010) index			0.0563***				0.0503***	
			3.67				*3.85*	
Missing Loderer et al. (2010) index			0.0099				0.0070	
			0.80				*0.56*	
Board approval (Y/N)				0.0132***				0.0113***
				4.24				*3.29*
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	0.458	0.495	0.488	0.424	0.601	0.548	0.623	0.570

Table V
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)	Completion Rate	CGQ index	Gov'Metrics index
Board approval (Y/N)	0.062							
Analyst coverage	-0.428	-0.023						
Change in Beta	-0.027	-0.022	0.031					
Takeover target (Y/N)	0.009	0.006	0.022	0.035				
Completion rate	-0.067	0.139	-0.001	0.030	0.058			
CGQ index	-0.049	0.375	0.210	-0.017	0.016	0.107		
GovernanceMetrics index	0.031	0.849	0.113	-0.008	0.035	0.146	0.510	
Loderer et al. (2010) index	0.146	0.822	-0.128	-0.011	-0.007	0.110	0.169	0.717

B. U.S. Buybacks

	U-index	Analyst coverage	Change in Beta	Takeover target (Y/N)	Completion Rate
Analyst coverage	-0.450				
Change in Beta	0.040	-0.018			
Takeover target (Y/N)	0.052	-0.019	0.023		
Completion rate	-0.061	0.058	0.052	0.037	
CGQ index	-0.016	0.003	-0.028	0.024	0.016

Table VI
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 buyback firm governance. 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. Buyback firm governance is measured by the ISS Corporate Governance Quotient (CGQ, replaced by 0 where missing; observations with missing CGQ index are identified by the Missing CGQ indicator). 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, leverage, dividend payout ratio, and percentage of stocks the firm is seeking to repurchase. In columns (1)-(2), the sample consists of open-market repurchase announcements, over the period 1998-2010, 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 (3)-(4), 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)-(2) the standard errors are clustered at the nation level, while in columns (3)-(4) they are heteroskedasticity-robust. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% level.

	(1)	(2)	(3)	(4)
CGQ index	0.0094***	0.0102***	-0.0024	0.0003
	3.27	*3.38*	*-0.46*	*0.05*
Missing CGQ index	-0.0004	-0.0014	0.0021	0.0042
	-0.13	*-0.43*	*0.44*	*0.72*
Prior return	-0.0133***	-0.0108**	-0.0226***	-0.0218***
	-2.77	*-2.22*	*-3.58*	*-3.57*
Size	-0.0030**	-0.0034**	-0.0068***	-0.0063***
	-2.09	*-2.54*	*-5.75*	*-5.39*
Book-to-market	-0.0012	-0.0010	0.0094**	0.0094**
	-1.38	*-1.25*	*2.28*	*2.20*
Dividend payout ratio		-0.0037		-0.0258***
		-0.45		*-3.37*
Leverage		0.0036		-0.0197
		0.65		*-0.71*
Percentage sought		0.0187		0.0382*
		0.81		*1.78*
Intercept		0.0287**		0.0551***
		2.30		*3.47*
Announcement year indicators	Yes	Yes	Yes	Yes
N. Obs.	5673	5673	3750	3750
R^2	0.010	0.013	0.044	0.051

Table VII
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. In all panels, the t-statistics are based on heteroskedasticity-robust standard errors. The sample consists of open-market repurchase announcements, over the period 1998-2010, 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.

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	0.76***	(3.66)	0.68***	(3.62)	0.64***	(3.74)	0.63***	(3.97)
Three-factor model	0.51***	(3.15)	0.46***	(3.22)	0.43***	(3.29)	0.42***	(3.29)
Four-factor model	0.63***	(3.72)	0.57***	(3.71)	0.54***	(3.83)	0.54***	(3.83)
U.S. buybacks								
One-factor model	0.58***	(3.03)	0.59***	(3.25)	0.55***	(3.18)	0.72***	(3.44)
Three-factor model	0.38***	(2.62)	0.37***	(3.00)	0.32***	(2.83)	0.51***	(2.95)
Four-factor model	0.51***	(4.62)	0.48***	(4.83)	0.44***	(4.34)	0.63***	(3.82)

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.	0.90***	(2.96)	0.86***	(3.11)	0.80***	(2.92)	0.75***	(2.88)
Asia-Pacific Ex-Japan	0.67**	(2.35)	0.58**	(2.40)	0.52**	(2.38)	0.60***	(2.93)
Europe	0.21	(1.27)	0.31**	(2.00)	0.18	(1.25)	0.22*	(1.71)
Japan	0.70***	(2.99)	0.58***	(2.66)	0.56***	(2.84)	0.61***	(3.20)
Three-Factor Model								
America Ex-U.S.	0.68**	(2.34)	0.65**	(2.51)	0.59**	(2.35)	0.57**	(2.36)
Asia-Pacific Ex-Japan	0.76***	(2.77)	0.67***	(2.86)	0.63***	(3.00)	0.70***	(3.64)
Europe	0.10	(0.76)	0.19	(1.55)	0.03	(0.27)	0.06	(0.67)
Japan	0.36**	(2.47)	0.27**	(2.14)	0.26**	(2.34)	0.28***	(2.68)
Four-Factor Model								
America Ex-U.S.	0.70**	(2.32)	0.67**	(2.46)	0.59**	(2.26)	0.57**	(2.27)
Asia-Pacific Ex-Japan	0.93***	(3.34)	0.81***	(3.36)	0.79***	(3.59)	0.84***	(4.22)
Europe	0.25*	(1.85)	0.35***	(2.78)	0.18	(1.61)	0.17*	(1.86)
Japan	0.41***	(2.86)	0.31**	(2.52)	0.31***	(2.79)	0.32***	(3.10)

Table VIII
Long-Run Returns (IRATS Method)

The table reports the long-run returns over 12-, 24-, 36-, and 48-month horizons following the buyback announcement date employing 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 cumulative 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. 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 1998-2010, 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.

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	10.26***	(0.00)	19.50***	(0.00)	26.45***	(0.00)	32.77***	(0.00)
Three-factor model	6.39***	(0.00)	12.10***	(0.00)	16.33***	(0.00)	21.53***	(0.00)
Four-factor model	6.74***	(0.00)	12.78***	(0.00)	17.12***	(0.00)	22.34***	(0.00)
U.S. buybacks								
One-factor model	6.35***	(0.00)	18.95***	(0.00)	32.86***	(0.00)	41.64***	(0.00)
Three-factor model	3.90***	(0.00)	11.02***	(0.00)	18.58***	(0.00)	22.51***	(0.00)
Four-factor model	5.63***	(0.00)	13.25***	(0.00)	20.72***	(0.00)	25.00***	(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.	12.88***	(0.00)	27.53***	(0.00)	43.28***	(0.00)	53.75***	(0.00)
Asia-Pacific Ex-Japan	8.04***	(0.00)	9.89***	(0.00)	9.19***	(0.00)	19.23***	(0.00)
Europe	3.21***	(0.01)	10.59***	(0.00)	15.55***	(0.00)	21.23***	(0.00)
Japan	12.40***	(0.00)	24.03***	(0.00)	31.63***	(0.00)	32.34***	(0.00)
Three-Factor Model								
America Ex-U.S.	9.65***	(0.00)	20.58***	(0.00)	32.22***	(0.00)	40.62***	(0.00)
Asia-Pacific Ex-Japan	6.84***	(0.00)	8.50***	(0.00)	9.52***	(0.00)	20.47***	(0.00)
Europe	1.75	(0.18)	6.57***	(0.00)	7.77***	(0.00)	9.71***	(0.00)
Japan	5.95***	(0.00)	11.57***	(0.00)	15.22***	(0.00)	17.41***	(0.00)
Four-Factor Model								
America Ex-U.S.	9.88***	(0.00)	20.80***	(0.00)	32.15***	(0.00)	40.16***	(0.00)
Asia-Pacific Ex-Japan	7.37***	(0.00)	10.42***	(0.00)	12.57***	(0.00)	23.81***	(0.00)
Europe	3.70***	(0.00)	10.01***	(0.00)	12.13***	(0.00)	14.44***	(0.00)
Japan	5.64***	(0.00)	10.63***	(0.00)	14.24***	(0.00)	16.35***	(0.00)

Table IX
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 all panels, in the first four columns the sample excludes U.S. buybacks, while in the next four columns it focuses on U.S. buybacks. In all panels, the results are based on U.S. dollar returns, and regional factor models for the expected returns. The table reports 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, and four-factor + takeover factor (Cremers et al., 2009) models, in panels A, B, C, and D respectively. 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 "Takeover target" and "Not takeover target" 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 1998-2010, 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.

Table IX Long-Run Returns and Takeover Targets – cont'd

Months relative to ann. date	Non-U.S. buybacks				U.S. buybacks			
	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)	(+1,+12)	(+1,+24)	(+1,+36)	(+1,+48)
A. One-factor model								
Takeover target	13.62***	27.13***	30.09***	34.74***	10.85***	27.83***	48.76***	53.30***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	10.11***	19.14***	26.26***	32.80***	6.19***	15.50***	25.33***	32.89***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	3.51	7.99**	3.82	1.94	4.66***	12.33***	23.42***	20.41***
	(0.18)	(0.03)	(0.39)	(0.69)	(0.00)	(0.00)	(0.00)	(0.00)
B. Three-factor model								
Takeover target	9.40***	20.17***	20.49***	23.83***	9.11***	20.50***	34.08***	33.37***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	6.28***	11.73***	16.14***	21.60***	3.42***	7.78***	12.35***	15.53***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	3.12	8.44**	4.34	2.23	5.69***	12.72***	21.73***	17.84***
	(0.24)	(0.03)	(0.37)	(0.67)	(0.00)	(0.00)	(0.00)	(0.00)
C. Four-factor model								
Takeover target	9.66***	20.09***	19.46***	20.44***	11.17***	23.37***	37.07***	38.80***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	6.62***	12.41***	16.97***	22.50***	5.20***	10.24***	15.05***	19.28***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	3.03	7.69*	2.49	-2.06	5.98***	13.13***	22.02***	19.52***
	(0.24)	(0.05)	(0.62)	(0.70)	(0.00)	(0.00)	(0.00)	(0.00)
D. Four-factor + Takeover factor model								
Takeover target	8.80***	19.02***	18.26***	19.72***	8.41***	17.31***	27.47***	28.57***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Not takeover target	6.37***	12.13***	16.85***	22.87***	3.18***	5.72***	7.27***	10.88***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Target – Not target	2.43	6.89*	1.41	-3.15	5.23***	11.59***	20.20***	17.69***
	(0.35)	(0.08)	(0.78)	(0.56)	(0.00)	(0.00)	(0.00)	(0.00)

Table X
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 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 1998-2010, 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 X Long-Run Returns and Undervaluation – cont'd

	One-factor model				Three-factor model				Four-factor model			
Months relative to ann. Date	**(+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	13.54***	29.56***	38.92***	45.34***	8.77***	18.92***	25.80***	32.68***	9.15***	19.48***	26.52***	32.63***
	(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	6.72***	14.25***	19.26***	23.30***	4.29***	9.31***	12.54***	15.45***	4.58***	10.01***	13.76***	17.18***
	(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	6.83***	15.31***	19.66***	22.04***	4.48**	9.61***	13.26***	17.22***	4.58**	9.47***	12.76***	15.45***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Low analyst coverage	12.12***	21.53***	27.86***	34.83***	7.75***	13.57***	18.32***	25.00***	7.86***	14.03***	18.88***	25.11***
	(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	8.00***	17.21***	25.20***	30.72***	4.84***	10.55***	14.62***	18.33***	5.48***	11.43***	15.55***	19.53***
	(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	4.11***	4.31*	2.66	4.11	2.91**	3.01	3.70	6.66**	2.38	2.60	3.32	5.58**
	(0.00)	(0.06)	(0.39)	(0.18)	(0.02)	(0.10)	(0.13)	(0.01)	(0.06)	(0.16)	(0.16)	(0.03)
						B. U.S. buybacks							
High U-index	13.21***	27.30***	37.30***	41.06***	8.77***	18.74***	25.29***	24.95***	11.51***	21.75***	28.83***	29.49***
	(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	4.56***	12.21***	23.12***	28.40***	3.27***	7.34***	12.89***	14.63***	4.45***	9.20***	14.92***	17.58***
	(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	8.64***	15.09***	14.17***	12.66***	5.50**	11.40***	12.40***	10.32**	7.06***	12.55***	13.90***	11.92**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)
Low analyst coverage	8.87***	19.59***	30.49***	40.91***	5.99***	12.13***	19.01***	24.88***	7.48***	14.19***	21.36***	28.15***
	(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	5.82***	16.03***	27.02***	31.98***	3.52***	8.73***	13.33***	14.32***	5.65***	11.40***	16.15***	18.09***
	(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	3.06**	3.55*	3.47	8.93***	2.46**	3.40*	5.68**	10.56***	1.83*	2.79*	5.22**	10.06***
	(0.01)	(0.07)	(0.18)	(0.00)	(0.03)	(0.07)	(0.04)	(0.00)	(0.07)	(0.08)	(0.03)	(0.00)

Table XI
Changes 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 1998-2010, 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	0.983	0.926	0.743	0.608	0.238	0.182	-0.028	-0.072
Standard deviation	0.728	0.640	1.207	1.085	1.405	1.193	1.013	0.761
Min	-0.724	-0.788	-2.441	-2.544	-4.362	-3.752	-3.471	-3.147
Percentile 25	0.518	0.512	0.055	-0.019	-0.407	-0.430	-0.455	-0.401
Median	0.898	0.856	0.597	0.505	0.297	0.195	-0.036	-0.025
Percentile 75	1.341	1.269	1.270	1.113	0.923	0.790	0.365	0.296
Max	3.901	3.554	4.956	4.605	4.338	4.201	3.415	2.372
% decreasing after buyback	54.9%		54.2%		50.1%		50.3%	
% significant decrease	6.7%		4.7%		4.5%		3.9%	

Table XII
Long-Run Returns and Company-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 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.

	One-factor model				Three-factor model				Four-factor model			
Months relative to ann. Date	(+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	7.79***	14.94***	20.68***	23.21***	6.09***	10.28***	14.26***	15.68***	6.55***	11.18***	15.44***	16.73***
	(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	7.46***	13.58***	17.70***	22.76***	3.03*	5.63**	7.62***	10.45***	3.67**	6.36**	9.30***	13.83***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.02)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
High – Low index	0.33	1.37	2.98	0.45	3.06	4.65	6.64*	5.23	2.88	4.82*	6.14*	2.91
	(0.88)	(0.60)	(0.36)	(0.90)	(0.15)	(0.12)	(0.07)	(0.20)	(0.15)	(0.09)	(0.07)	(0.45)
B. U.S. buybacks												
High CGQ index	5.14***	17.35***	28.35***	35.39***	2.65***	8.63***	12.88***	15.40***	4.25***	10.35***	14.61***	17.69***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low CGQ index	7.67***	19.60***	31.94***	39.48***	4.83***	10.95***	17.11***	20.54***	6.66***	13.10***	19.23***	23.39***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High – Low index	-2.53**	-2.25	-3.59*	-4.08**	-2.17**	-2.32	-4.23**	-5.14**	-2.41**	-2.74	-4.62**	-5.70***
	(0.03)	(0.17)	(0.05)	(0.04)	(0.03)	(0.15)	(0.02)	(0.01)	(0.03)	(0.10)	(0.01)	(0.00)

Table XIII
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, excluding 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	8.59***	19.78***	30.33***	38.55***	6.67***	15.15***	22.38***	28.67***	7.20***	15.91***	22.97***	29.07***
	(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	11.91***	19.54***	23.08***	27.74***	5.73***	8.74***	10.46***	15.46***	5.41***	8.51***	10.54***	15.46***
	(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	-3.31*	0.24	7.24**	10.80**	0.94	6.41***	11.91***	13.20***	1.79	7.41***	12.43***	13.61***
	(0.05)	(0.93)	(0.05)	(0.01)	(0.52)	(0.00)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)
B. Loderer et al. (2010) Index												
High Loderer et al. (2010) index	10.20***	22.70***	35.78***	44.61***	8.00***	17.63***	27.42***	34.48***	8.28***	17.97***	27.28***	33.79***
	(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	10.59***	17.19***	20.66***	24.79***	4.02***	5.59***	5.88**	9.26***	4.23***	5.97***	6.91***	10.93***
	(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	-0.39	5.51*	15.13***	19.83***	3.98**	12.04***	21.59***	25.22***	4.05**	12.01***	20.37***	22.86***
	(0.83)	(0.08)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)

Table XIV

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.

	One-factor model				Three-factor model				Four-factor model			
Months relative to ann. Date	**(+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	10.58***	23.32***	35.93***	44.83***	8.52***	18.61***	28.53***	36.21***	8.81***	18.96***	28.35***	35.67***
	(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	10.04***	17.29***	21.14***	26.02***	4.71***	7.76***	9.22***	13.16***	4.95***	8.45***	10.54***	14.81***
	(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	0.54	6.03**	14.79***	18.81***	3.80**	10.85***	19.31***	23.05***	3.85**	10.51***	17.81***	20.86***
	(0.77)	(0.04)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)

Table XV Long-Run Returns in recent years (IRATS Method, 2003-2010 announcements)

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, restricting the sample to buyback announcements made after 2002, from the 31 countries listed in the appendix, in addition to U.S. buybacks over the same period. In all specifications, the standard errors are clustered around country 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.

	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	9.47***	(0.00)	16.16***	(0.00)	19.34***	(0.00)	21.97***	(0.00)
Three-factor model	6.45***	(0.00)	11.07***	(0.00)	14.03***	(0.00)	17.98***	(0.00)
Four-factor model	6.38***	(0.00)	11.31***	(0.00)	15.02***	(0.00)	19.26***	(0.00)
	U.S. buybacks							
One-factor model	5.88***	(0.00)	7.34***	(0.00)	7.61***	(0.00)	8.40***	(0.00)
Three-factor model	3.51***	(0.00)	4.73***	(0.00)	4.38***	(0.00)	5.39***	(0.00)
Four-factor model	3.59***	(0.00)	4.91***	(0.00)	5.73***	(0.00)	7.99***	(0.00)

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 1998-2010, 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.
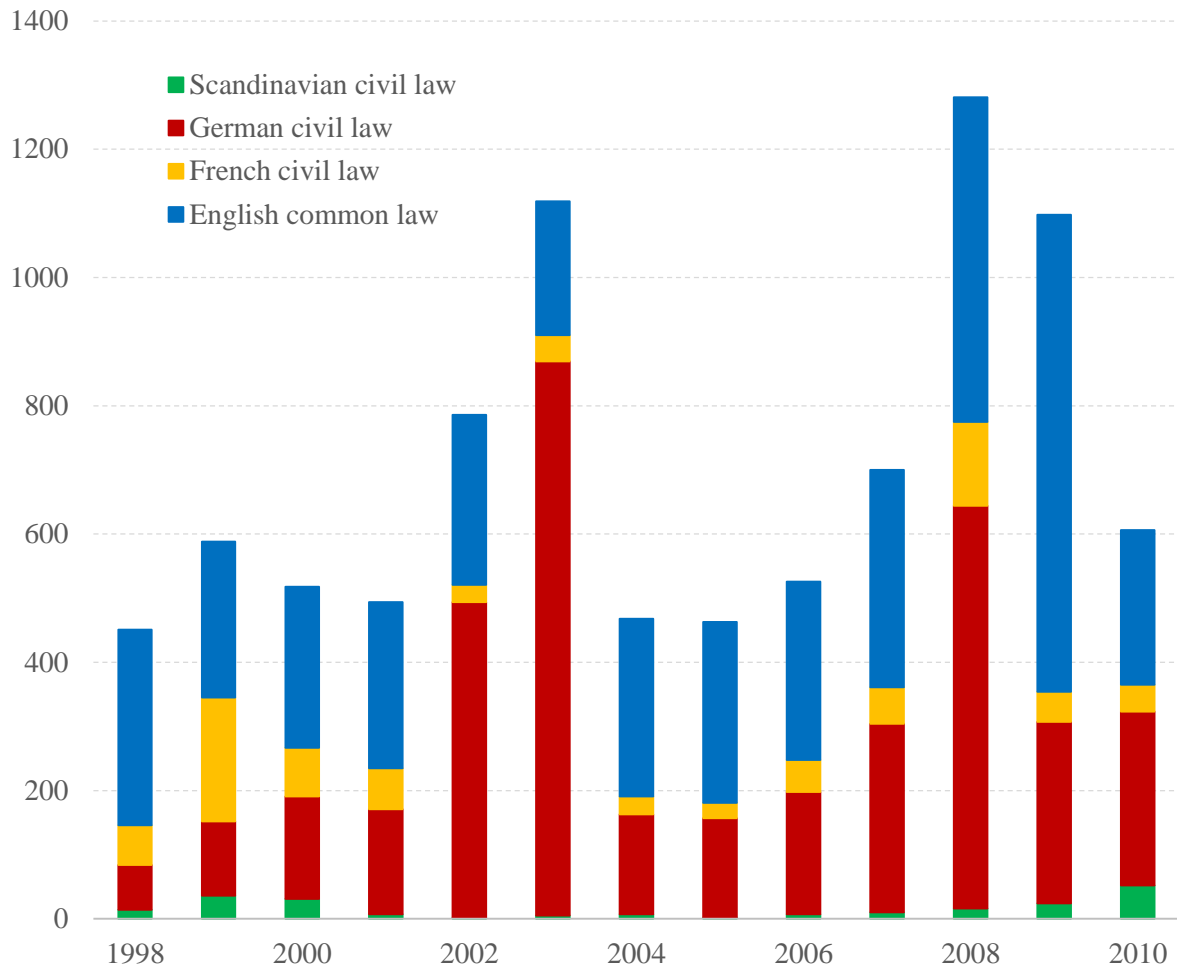
Figure 2. Announcement Returns

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 1998-2010, 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
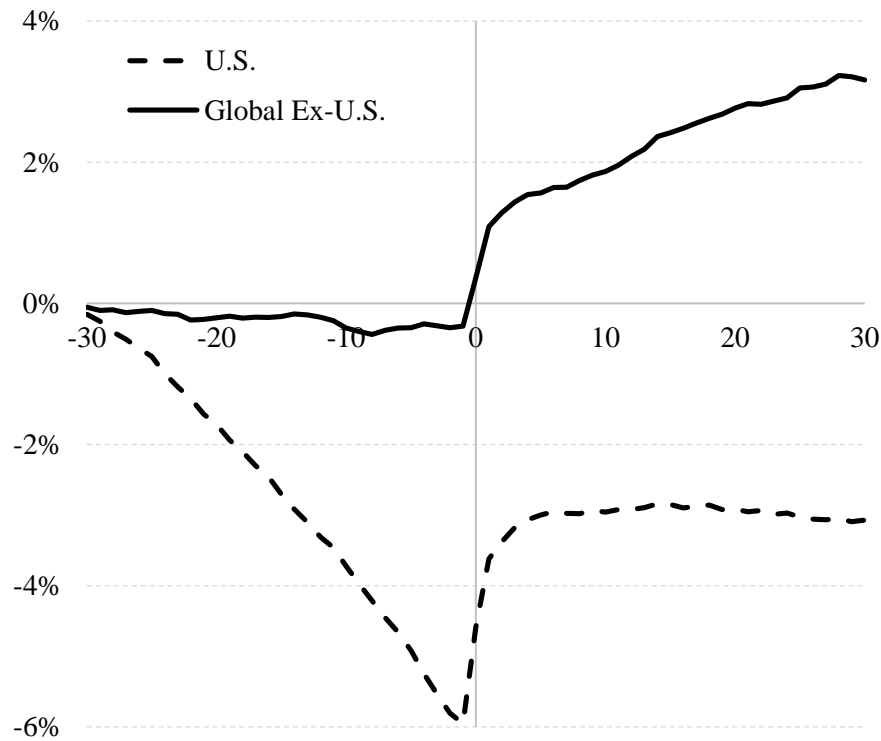
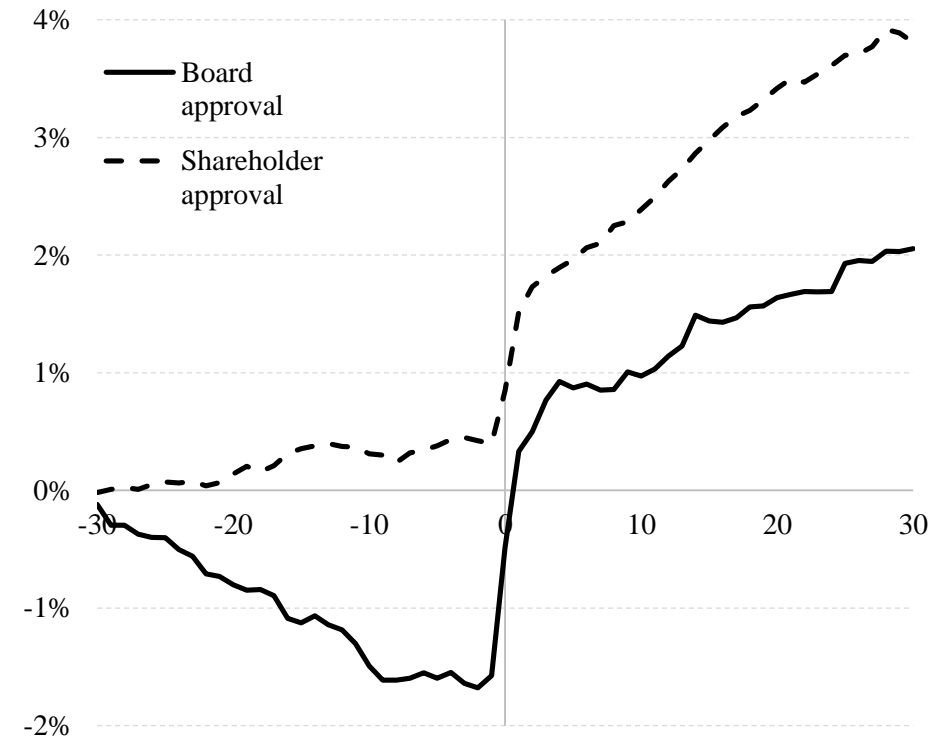B. Non-U.S. Buybacks, Board and Shareholder Approval

Figure 3. 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 1998-2010, 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.
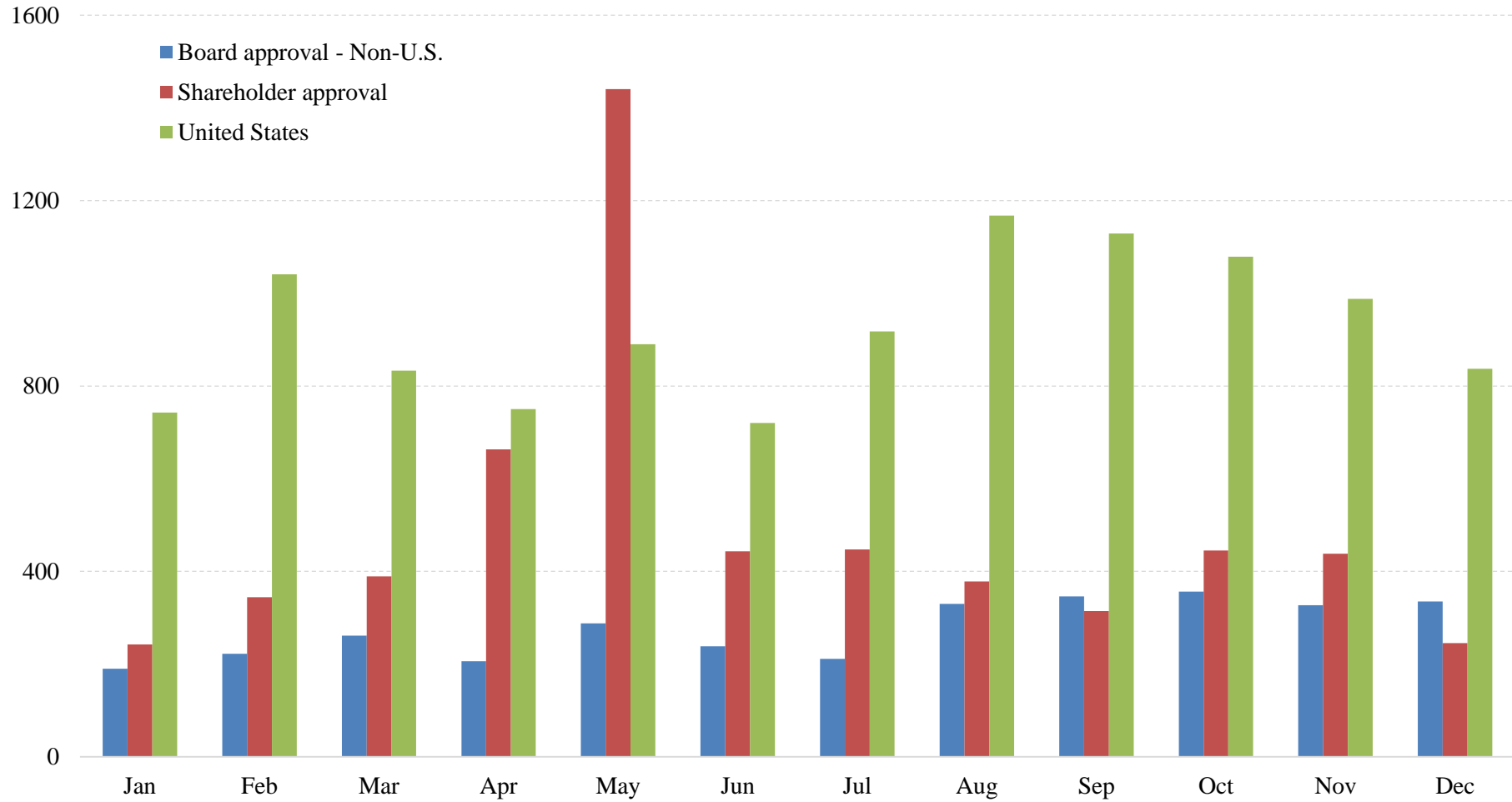
Figure 4. Long-Run Returns, by Region

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 1998-2010, 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.
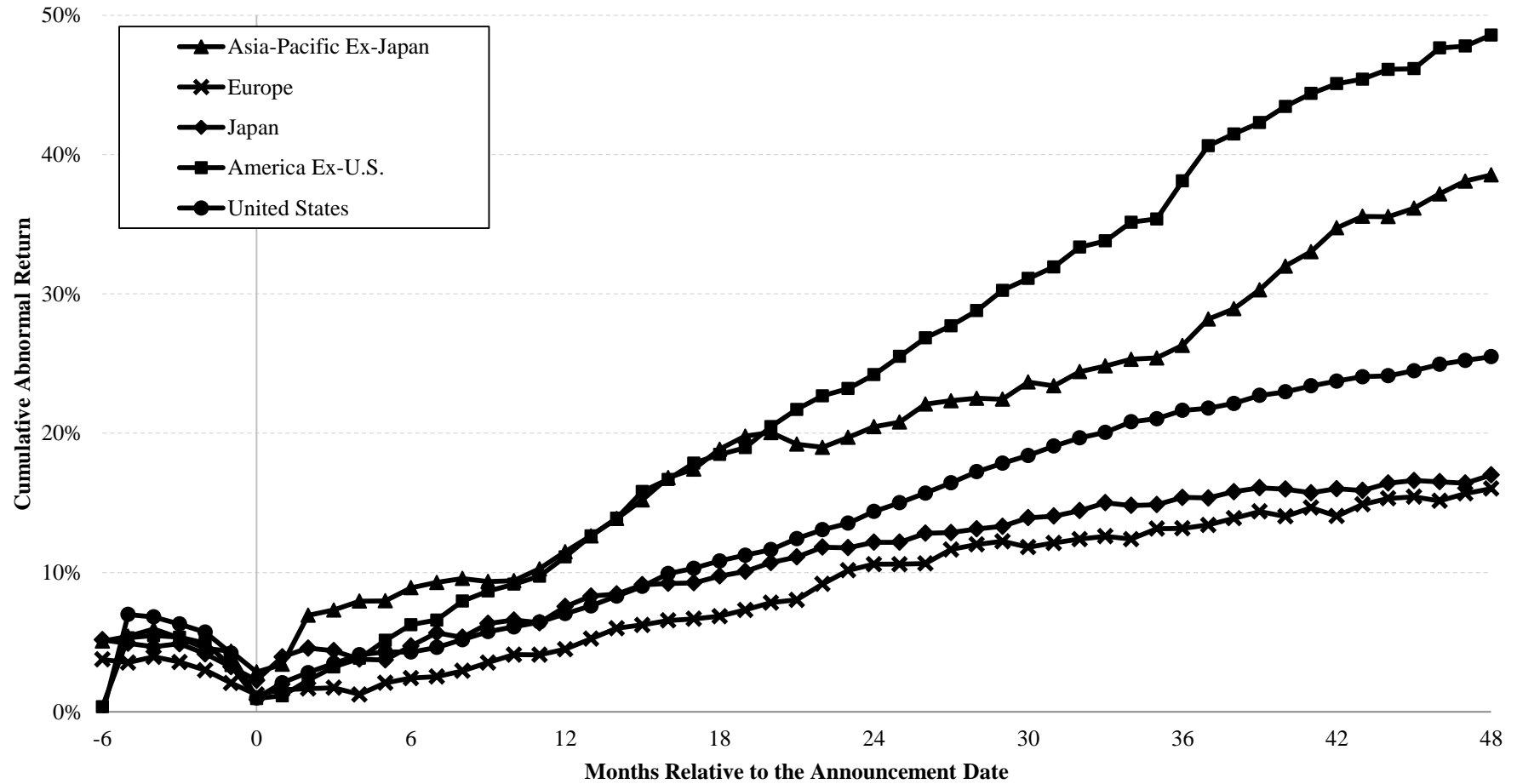
Figure 5. Analyst EPS Forecast Revisions Prior to the Buyback announcement
The graph illustrates analyst EPS forecast revisions over the six-month period prior to the buyback announcements, for buyback firms in the "High U-index" and "Low U-index groups" defined above and in the text. For each buyback firm and month t relative to the announcement date, the analyst forecast revision $\big(EPS(t) - EPS(0)\big)/P(0)$ 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.