Are Buybacks Good for Long-Term Shareholder Value? Evidence from Buybacks around the World

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Keywords: buyback, share repurchase, governance, market timing, agency problems, global regulation

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Abstract

Using a sample of over 9,000 buyback announcements from 31 non-U.S. countries, we find support for the results of studies based on U.S. data: on average, share repurchases are associated with significant positive short-term and long-term excess returns. However, excess returns depend on the likelihood of undervaluation, the efficiency and liquidity of equity markets, and the popularity of stock option compensation. In contrast to findings in U.S. markets, we do not find that these long-term excess returns are simply a compensation for takeover risk or have become less significant in recent years.

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I Introduction

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 in the popular press and by politicians for undermining economic growth, leading firms to skimp on long-term investment to pursue short-term objectives such as earnings per share.[1] The implicit assumption behind these arguments is that companies underinvest, and may use buybacks to prop up their stock price in the short run at the expense of long-term shareholder value. This concern motivates calls for more stringent regulation (Voth (2008, p. 57)), or for requiring greater shareholder oversight as in many non-U.S. countries, where, for instance, repurchase authorizations must be explicitly approved by shareholders.[2]

The criticism that buybacks are detrimental to long-term shareholder value, however, is at odds with the literature on U.S. buybacks showing that they are associated not only with a stock price increase at the time of the buyback authorization, but also with positive long-term excess returns (Ikenberry et al. (1995), Peyer and Vermaelen (2009), Dittmar and Field (2015)). At the same time, long-term excess returns are an anomaly, and anomalies can be the result of data mining or chance. Moreover, recent studies argue that the long-term returns can be explained by takeover activity or may compensate investors for takeover risk exposure and thus do not create *value* (Bargeron et al. (2017); Lin et al. (2014)), or that they have strongly declined in recent years, due to improved market efficiency (Fu and Huang (2015)). In sum, some of the

[1] Cf. e.g. "The Repurchase Revolution," *The Economist*, September 13, 2014; E. Luce, "US Share Buybacks Loot the Future," *The Financial Times*, April 26, 2015; R. Rieder, "Winners and losers from share buybacks," *The Financial Times*, June 15, 2015. Regarding the criticism from politicians, Hillary Clinton recently claimed that "corporate revenue is going to stock buybacks (…) instead of benefitting consumers, employees, and the economy as a whole" ("Hillary Clinton: being pro-business doesn't mean hanging customers out to dry", *Quartz*, October 20, 2015).

[2] In the E.U. for instance, in addition to the individual states' corporate law, share buybacks are also regulated under the Market Abuse Directive (2003/6/EC), suggesting that at least some regulators worry that buybacks can be detrimental to investors.

recent literature is less supportive of the argument that share buybacks are associated with higher shareholder value in the long-run.

We address these challenges by studying a sample of 9,034 buyback announcements in 31 non-U.S. markets over the period 1998-2010. As Fama (1998) points out, one way to test whether an anomaly is "real" is to examine it in a completely different data set – in our case, an international one. Using the same methodology as in U.S. studies, we find that, at least on average, buyback announcements made by non-U.S. companies are followed by significant positive short-term and long-term excess returns. Furthermore, outside the U.S. long-term returns following buyback announcements are indistinguishable between firms that become takeover targets and firms that do not, and controlling for takeover risk exposure has no impact on long-term returns. Finally, we find that long-term excess returns outside the U.S. have not declined in recent years. Although in the U.S. long-term excess returns have become smaller in recent years, they have not disappeared.

Two caveats. First, these results by themselves do not prove that a share buyback *creates* shareholder value. If the long-term positive excess returns simply reflect the fact the stock was undervalued at the time of the repurchase announcement, it may well be that without the buyback the value of the firm would have been even higher. In that case this paper shows that, at least on average, the extent of undervaluation is larger than any negative real effects from the buyback, such as e.g. underinvestment. Second, as we extensively discuss in the next section, this is not the first paper that examines long-term excess returns in non-U.S. countries. However, as we cover a much larger number of countries than in past research, we can test whether country-specific characteristics explain long-term as well as short-term excess returns.

While, on average, buybacks are beneficial for long-term investors, when we dissect the cross-section of buybacks around the world we find evidence supporting a more nuanced view. Not all buybacks are created equal: positive long-term excess returns follow buyback announcements in some countries, but

not in others. For example, share buybacks are followed by significant *negative* long-term excess returns in Greece and in Spain. We test to what extent company-specific and country-specific variables can explain the cross-sectional variance of long-term excess returns.

We find that short- and long-term excess returns are significantly larger for small, beaten-up value firms, i.e. firms with a high U-index, a proxy for the likelihood of undervaluation proposed by Peyer and Vermaelen (2009). This is in line with survey evidence from the U.S., where 80% of managers report "stock price is too low" as a motivation for announcing a buyback (Brav et al. (2005)). Our results are consistent with this claim, and support the "market timing" hypothesis that managers are able to time the buyback announcement when their stock is undervalued (Peyer and Vermaelen (2009)).[3] Consistent with Bargeron et al. (2017), long-term excess returns are also higher when buybacks are followed by other buybacks. Also, consistent with this market timing hypothesis, we find that excess returns are larger in markets that are less likely to be efficient, i.e. illiquid markets.

Moreover, in countries where stock option compensation is more common long-term excess returns are smaller. To the extent that this form of compensation creates an incentive for managers to increase earnings per share (EPS), this suggests that repurchases driven by EPS management are not necessarily in the interest of long-term shareholders (Kahle (2002), Bens et al. (2003), Lin et al. (2009)).

One surprising result is that buyback completion rates are negatively related to long-term stock returns (significantly when we include U.S. buybacks). A negative relation could exist if managers cancel the buyback because the stock price has become efficient: when the stock is no longer undervalued,

[3] The market timing 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)), reduce agency costs of free cash flow (Jensen (1986), substitute dividends to create more financial flexibility (Jagannathan et al. (2000)), or take advantage of the option to buy back stock from uninformed outside investors (Ikenberry and Vermaelen (1996)) or less informed outsiders (Bargeron and Bonaime (2016)). 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 (2016), Massa et al. (2007)).

managers have no incentive to complete the buyback. Ikenberry et al. (2000) report evidence consistent with such strategic behavior in Canadian buybacks. In order to better understand why firms complete buybacks, we thus also test for the cross-sectional determinants of the buyback completion rate.[4] We find that completions rates are higher when the stock is less likely to be undervalued and when the company subsequently becomes a takeover target. The completion rate is also higher in non- U.S. countries with a larger dividend tax disadvantage and where stock option compensation is more common. This is consistent with the hypothesis that buybacks not driven by undervaluation (e.g. saving personal taxes on dividends, takeover defense, or earnings per share management) are more likely to be completed.

Some of the country-specific variables that do not show up significantly in long-run excess returns explain short-run excess returns. First, outside the U.S, in countries where dividends are taxed higher than capital gains announcement returns are higher, which is consistent with the hypothesis that investors prefer buybacks to dividends for tax reasons. Second, excess returns are larger when the board, and not the shareholders, approves the buyback. This is consistent with the hypothesis that announcements that the management intends to ask shareholder approval of a buyback at the next shareholders meeting are a weaker signal of current undervaluation than a board announcement.

In sum, our paper represents, to our knowledge, the most extensive analysis of buybacks around the world. Such a global approach allows testing for the relevance of country-specific characteristics as well as for the robustness of the findings reported by research on U.S. markets. The long-term excess results fail to support the claim that buybacks are, in general, detrimental to long-term investors. However, not all buybacks are equal. Small, beaten-up, value stocks in countries where markets are likely to be less efficient because of poor liquidity are more likely to be repurchased because of undervaluation. In contrast to results on U.S. markets, there is no evidence that long-term excess returns are mainly driven by subsequent

[4] We thank the referee for this suggestion.

takeover bids, or that excess returns have declined in recent years. Consistent with Bargeron et al. (2017), also in non-U.S. markets a significant fraction of long-term excess returns after a buyback announcement can be explained by subsequent buyback announcements.

The remainder of the paper is organized as follows. Section II discusses past research on non-U.S. buybacks to better assess our contribution to the literature. Section III describes our data. Section IV reports our analysis of short-run announcement returns. Section V discusses our methodology and results on long-run returns. Section VI concludes.

II. Relation to the literature

We condense the findings of prior studies on share buybacks in non-U.S. countries in Table I. The literature so far has mostly focused on short-term announcement returns. Table I.A provides an overview of the results of 41 studies on open market buyback authorization announcements in 22 different countries.[5] With the exception of Andriosopulos and Lasfer (2015), Lee et al. (2010), and Van Holder and Van de Kerkhove (2015), all studies are individual country-specific. The general conclusion from Table I.A is that, on average, buybacks generate positive or at least no negative announcement returns. The results in this paper confirm this conclusion.

Based on this evidence, if markets are efficient, we can reject the hypothesis that, at least on average, share buybacks are bad for shareholder value. However, if markets overreact, it is necessary to verify whether these initial positive announcement returns reverse in the long run. Long-term event studies on non-U.S. countries are less common, and the results are less consistent than the short-term studies. Table I.B reports the results of 16 long-term event studies on buybacks in 18 non-U.S. countries. Apart from

[5] Announcement returns are defined as the cumulative average excess return from day -1 until day +1 relative to the buyback authorization date, if daily excess returns were available. Otherwise, we report the results associated with the shortest window reported in the paper. All these studies use buyback authorisation announcements, not announcements of completed repurchases.

Timmer (2007),[6] all other 15 studies are individual country-specific, covering Canada, Hong Kong, Japan, Korea, Malaysia, Norway, Sweden, Taiwan, Thailand, South Africa, and the United Kingdom. Nine studies find significantly positive long-term excess returns, two report significant negative excess returns, and the remaining five report insignificant long-term returns.

The lack of consistency may well be a result of small sample sizes, different time periods and investment horizons, different methodologies to estimate expected returns, and the fact that some studies center on actual repurchases rather than the buyback authorization announcement. Because most studies focus on a single country, past research has not been able to address one of the major objectives of our paper: explaining the cross-sectional variance of long-term excess returns, i.e. to what extent country-specific factors, such as for example governance quality and regulation, explain post-buyback excess returns.[7]

A couple of studies present results that indirectly relate to long-run returns following share buyback announcements. McClean et al. (2009) study the impact of country-specific variables on long-term excess returns after net issuance (equity issues minus share buybacks). However, as only 7% of their sample is classified as reductions in equity capital, this is effectively a study on the long-term consequences of equity issues. Moreover, using changes in the number of shares outstanding may underestimate repurchase activity, as firms may buy back stock and reissue shares in the same calendar year, for example when executives exercise stock options or bonds are converted into equity. Firms that announce a buyback and do not complete it if the market price becomes efficient (Ikenberry et al. (2000)) may well end up as being classified as net stock issuers in a given the year. For that reason, we test the market timing ability of managers focusing on the buyback authorization announcement as the event date. Moreover,

[6] We thank the referee for drawing our attention to this paper.
[7] Timmer (2007) uses a sample of 275 buyback announcements from 8 different countries, but cannot find any specific factors explaining differences across countries.

Andriosopoulos et al. (2016) forecast what firms will engage in share buybacks, and document excess long-run returns on those firms. As buybacks generate positive announcement returns, a forecasting strategy will indeed generate excess returns, but this need not represent evidence of managerial market timing.

Our paper makes four main contributions to the literature. First, we document the existence of the buyback anomaly, on average, in all major regions outside the U.S.: Asia-Pacific ex-Japan, America ex-U.S., Europe, and Japan, using data on 31 countries. Second, because we use a much broader international sample than past research, we can test whether cross-sectional differences in short-term and long-term returns can be explained by country-specific variables such as governance quality and investor protection, the efficiency and liquidity of capital markets, the relative taxation of dividends and capital gains, as well as executive compensation practices. In contrast to previous country-specific studies or studies limited to a small number of countries, we employ a uniform methodology as well as a common time period and investment horizon. Third, we test whether recent findings on U.S. data suggesting that the long-term returns capture takeover risk (Bargeron et al. (2017), and Lin et al. (2014)) and that they have disappeared in recent years (Fu and Huang (2015)) are robust in an international setting. We find that takeovers, the exposure to takeover risk, or improved market efficiency in recent years, do not appear to explain the long-term performance of buyback stocks outside the U.S. Only in the U.S. are excess returns consistent with the relevance of takeover risk as well as improved market efficiency. However, in contrast to Fu and Huang (2015) but consistent with Lee et al. (2015) long-term excess returns have not disappeared in recent years. Combined with the earlier literature (i.e. Peyer and Vermaelen (2009) and Ikenberry et al. (1995)), 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. While this underreaction is not always stable over time, the combined evidence does not support the hypothesis that the anomaly is disappearing. Fourth, our results address the recent wave of criticism of share buybacks. The popular argument that buybacks are a tool for short-term

stock price manipulation at the expense of long-term value does not find support in our findings as a general case. At the same time, we only find limited evidence on the relevance of country-specific measures of corporate governance for short-term and long-term returns. This finding contrasts with Ellis et al. (2011)), who show that country governance quality matters when firms make other corporate decisions such as acquisitions, as well as with Caton et al. (2016), who find that company-specific measures of governance quality are positively related to long-term excess returns after buybacks announced by U.S. firms.

III. 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,[8] and focus on the 31 non-U.S. nations with at least 30 buyback announcements reported in SDC in the sample period,[9] resulting in a sample of 9,034 non-U.S. buyback announcements. As a benchmark, we also collect 11,096 announcements from U.S. firms over the 1998-2010 period.[10]

[8] Over the sample period, SDC reports only a few hundred non-open market buybacks outside the U.S., largely privately negotiated. We exclude going-private transactions by requiring that the percentage of shares sought for the buyback is less than 50%.

[9] Data availability reduces the number of announcements in our sample to below 30 for Belgium, Greece, and Singapore; see the Internet Appendix. 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. the Internet Appendix 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, we might have fewer announcements than prior studies focused on individual countries, and collecting information based on local news and stock exchange information.

[10] We focus on announcements of buyback *authorizations* or, in cases where shareholders have to approve buybacks, announcements that the management plans to ask for an authorization at the next shareholders meeting. We do not analyze trading profits around *actual* buyback activity. Although there is a growing literature measuring whether companies can buy back shares at discounts from market prices over short horizons (Dittmar and Field (2015) and Bonaime et al. (2016) in the U.S., McNally et

Table II 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%. The United States is by far the country where share buybacks are the most popular, as on average 9.5% of traded companies repurchase shares. Except for Brazil, Hong Kong, and Japan, the percentage of listed firms that announce share buybacks is 3.1% or smaller.

One potentially relevant difference across countries is buyback completion rates. For instance, the market reaction to buyback announcements could be smaller, to the extent that shareholders do not expect the firm to exercise the option to repurchase. Table III reports completion rates, defined as the percentage of the announced buyback that is actually completed (see the Internet Appendix), using the Stephens and Weisbach (1998) methodology. 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.[11] In section V we examine the determinants of completion rates, as well as whether they impact long-term stock returns.

al. (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 the ability of managers to exploit fundamental misvaluation. One argument against using buyback authorizations (instead of completions) is that not all buybacks are completed (Stephens and Weisbach (1998)); indeed, 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 et al. (2000).

[11] 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. We find evidence consistent with this, with a peak in the number of announcements in April-May, when meetings tend to take place, in countries under a shareholder-approval regime (see Internet Appendix). 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%. Another reason for the difference in completion rates reflects the fact that, following Stephens and Weisbach (1998), they are estimated as the monthly decrease in shares outstanding when the number of shares outstanding decreases, and zero otherwise. This may bias completion rates downwards if firms issue and repurchase shares in the same month. Such behavior could be the result of the fact that repurchased shares are reissued to

There is, finally, some variation in the number of repurchase announcements over time. 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 (Figure 1).

IV. Buybacks and Short-Term Announcement Returns

We start by analyzing the market reaction to buyback announcements. First, we ask whether shareholders view the buyback announcement as positive news, consistent with U.S. evidence. Second, we ask whether the announcement returns can be explained by company-specific factors proposed in the literature: the Peyer-Vermaelen (2009) U-index, leverage, dividend payout, and percentage of shares sought, and an indicator for whether the buyback is a "subsequent" announcement that follow previous buyback announcements. In addition, we include a number of country-specific factors: the quality of corporate governance and investor protection (including whether shareholders have to approve the buyback), the relative taxation of dividends and capital gains, managerial compensation, and capital market characteristics such as liquidity, analyst coverage, institutional ownership, and ownership concentration.

We estimate cumulative abnormal (market-adjusted) returns (CAR) for 3-day (-1,+1), 5-day (-2,+2), and 7-day (-3,+3) intervals around the announcement date.[12] For robustness, we also compare the

executives when they exercise stock options (Kahle (2002)). A third issue with completion rates is that programs have different maturities, but can be extended. For example, in Europe shareholders typically authorize buyback programs for a duration of 18 months, or in Canada, one year. Because authorizations can be renewed, the fact that a Canadian program is not completed after one year does not mean that the firm will not complete the program in the long run. Completion rates may be also driven by strategic considerations as documented by Ikenberry et al. (2000): if after the buyback authorization stock prices rise because markets become efficient or because the firm has a new investment opportunity, it may decide not to complete the program.

[12] 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.

announcement returns in each country to a bootstrapped distribution of U.S. announcement returns based on a sample of identical size.[13]

Table IV 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,[14] a result consistent with past research (Table I.A).

In Table V we regress announcement returns against the set of company- and country-specific variables. The different columns correspond to different model specifications (different explanatory variables and adjustments for fixed effects) as well as samples: in columns (1)-(4) and (6) the sample is restricted to non-U.S. buybacks; column (5) and (7) include U.S. buybacks. A detailed description of the explanatory variables, and summary statistics, are provided in the Internet Appendix.

Across all regression specifications, the U-index has a significant positive coefficient. To construct the U-index, firms are classified into terciles based upon their return over the 6-month period prior to the buyback announcement, size, and book-to-market ratio. The index ranges from 3 to 9, based on the buyback firm's rank in terms of prior return, size, and book-to-market. Higher values of the U-index are indicative of undervaluation, following Peyer and Vermaelen's (2009) argument that small, beaten-up, value stocks are more likely undervalued. The results in Table V suggest that the market uses the U-index as a signal of

[13] The details of the bootstrap procedure are described in the Internet Appendix.

[14] One notable case is Hong Kong, where the announcement returns are close to zero, despite the fact that buybacks are relatively common in this market (693 announcements). We downloaded a random sample of 30 Hong Kong buyback announcement press releases in our sample from the Hong Kong Stock Exchange website (hkex.com.hk) and screened them, and found that in all cases they are joint announcements, asking shareholders authorization for equity issues as well as share buybacks.

undervaluation. But as we show in section V, this response is an underreaction, as the U-index is also significantly positively related to long-term excess returns.

The indicator for subsequent buyback announcements also has a significant, but negative, coefficient in all specifications. This is consistent with the evidence from Andriosopoulos and Lasfer (2015) that subsequent buyback announcements have less information content, perhaps because follow-up buybacks are less unexpected than the first. Finally, in most specifications firms that announce a larger buyback (higher percentage of shares sought to buy back) have higher announcement returns.

We then turn to country characteristics. First, we focus on the impact of corporate governance and legal investor protection. Share buybacks can be driven by "good" reasons, such as agency costs of free cash flow reductions, market timing, or corporate tax savings. However, they can also be motivated by "bad" reasons, such as manipulation of earnings per share (Bens et al. (2003), Almeida et al. (2016)), Hribar et al. (2006), Chan et al. (2007), Cheng et al. (2015)), fighting takeover bids to increase managerial entrenchment, 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)). We consider two measures of governance quality: the Anti-director index of Djankov et al. (2008), and the Leuz et al. (2003) earnings management index, which is relevant in light of the concern discussed in the introduction that buybacks could be an EPS management tool.[15] In addition, we include an indicator equal to one if the buyback has to be approved by the board rather than by shareholders. Around the world, there are two regimes (Kim et al. (2005)). The first one, followed in the U.S. as well as Australia, Canada, India, Israel, New Zealand, Switzerland, Taiwan, and Thailand, only requires board approval to announce a share buyback. The second approach, followed in the rest of the countries in our sample, requires the explicit approval of the shareholder assembly, with the aim to protect shareholders against buybacks driven

[15] Note that higher values for the Leuz et al. (2003) index indicate *worse* governance quality. We include missing-value indicators for countries without available Leuz et al. (2003) index.

by value-destroying motives. 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)), it is an empirical question whether this concern also applies to buybacks.[16]

In addition to those country-level factors, we also analyze the relative taxation of dividends and capital gains (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000)), managerial option compensation, and financial market characteristics such as liquidity and transparency (Fong et al. (2017)), analyst coverage (Degeorge et al. (2013)), institutional ownership, and ownership concentration (Djankov et al. (2008)). Detailed definitions and summary statistics for these variables are provided in the Internet Appendix.

First, we find that governance, measured by the Anti-director index has a positive impact on announcement returns. However, the impact becomes insignificant once we include U.S. buybacks in the sample. Moreover, the coefficient on the Leuz et al (2003) index has a positive sign (also insignificant once U.S. buybacks are included).

Second, we find a positive and highly significant association between board approval and announcement returns, with an economically important effect. The estimates suggest that firms board approval countries experience, on average, a 2% to 4% higher CAR. While this is consistent with superior board decision making, it could also simply reflect that an announcement that during the next shareholders meeting the management will ask permission to buy back stock is not very informative. A board

[16] As pointed out by Kim et al. (2005), countries may differ in their regulation of share buybacks along a number of other dimensions. Many of these, however, have to do with the regulation of actual buyback activity rather than with buyback announcements. For instance, there can be timing, price, and volume restrictions regarding when and at what conditions firms can buy their own stock – e.g. in Japan a firm may not buy its stocks during the last half-hour of a trading day, at a price above the previous day's closing price, or for a number of share exceeding 25% of the average daily trading volume of the previous month (Kim et al. (2005)). While potentially interesting, these restrictions are beside the focus of this paper, which revolves on the effect of buyback announcements, rather than execution. It is also not obvious how other aspects of the regulation can lead to differences in short- and/or long-term excess returns. For instance, in a number of countries there are limits on the duration of buyback authorizations (e.g. 12 months in Canada, 18 in most European countries); but such a constraint is rarely binding, as authorizations can be renewed. These reasons suggest our focus on the only regulatory aspect that can, on an ex-ante basis, make a difference for managerial timing ability: shareholder approval or board approval.

announcement is more likely a response to a stock market decline, and therefore may represent a stronger signal of undervaluation. Consistent with this interpretation, we find that in board approval countries outside the U.S. buyback announcements are preceded by negative returns of about -2%, whereas in board approval countries the pre-announcement returns are near zero.

Finally, we find evidence consistent with a personal tax motivation for buybacks: to the extent that dividends are taxed more than capital gains investors prefer buybacks. As a result, investors react more positively to buyback announcements in countries where the taxation of dividends is relatively high. However, this effect is no longer significant once we include U.S. buybacks.

In sum, our analysis of the short-term market reaction to global buyback announcements suggests that buybacks are mostly perceived to be value increasing, at least in the short term. Buyback announcements are associated with greater stock price increases if the firm is a small, beaten-up, value stock (high U-index), and if only board approval is required. We do not find robust evidence that investors incorporate the quality of corporate governance when they assess the stock price impact from a buyback announcement. The more controversial question is whether buybacks are also followed by long-term excess returns, a question we address in the next section.

V. Buybacks and Long-Term Returns

In this section, we first test whether firms outside the U.S. exhibit positive long run abnormal returns, as documented for the U.S. in Ikenberry et al. (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 Bargeron et al. (2017) and Lin et al. (2014), and if they disappear in recent years, as suggested by Fu and Huang (2015). Next, we test if excess returns are driven 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, in a multivariate regression we jointly estimate the impact of firm- and country-characteristics on long-term excess returns and buyback completion rates.

If markets are efficient, we would expect no relation between long-term returns and the variables in Table V such as the U-index, governance quality and investor protection, or taxation. These tests, therefore, are implicitly tests of market underreaction. Positive long-term excess returns are necessary to support one of the typical "good" managerial motivations for buybacks, i.e. that the stock is a good investment. If the stock price becomes efficient immediately after the buyback authorization announcement, the management would simply not exercise its option to repurchase stock. Non-negative long-term excess returns are also necessary to counter the argument that buybacks are simply a short-term earnings per share manipulation scheme, not driven by undervaluation, reduction in agency costs or taxes, but an example of myopic capitalism that ultimately is bad for shareholders in the long run.

A. Methodology

We estimate U.S. dollar long-term abnormal returns using the Ibbotson (1975) Returns Across Time and Securities (RATS) and calendar-time (Fama (1998)) methods.[17] Expected returns are estimated using Fama and French's (2012) "global" and "regional" factor models, for four regions: Asia-Pacific Ex-Japan, America ex-U.S., Europe, and Japan.[18]

[17] 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). We apply the filters used by Ince and Porter (2006) and Karolyi et al. (2012) to the Datastream stock returns data used on the ex-U.S. sample. These filters are described in detail in the Internet Appendix.

[18] Fama and French (2012) argue that factor models applying to multiple countries are adequate only under sufficient market integration, and Griffin (2002) finds that global factor models can result in large pricing errors. This suggests the global factors might be inappropriate. However, country-specific factor models would be based, for many countries, on factors constructed from a very small number of stocks. The regional factors are thus a reasonable compromise. An alternative approach might use the factors of Hou et al. (2011). 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 addition, the Fama and French (2012) regions do not span the entire set of our sample countries. Therefore, we assign some of them to Fama-French regions based on geographic proximity and economic linkages: Brazil and Mexico 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.

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 depending on the horizon). The composition of the portfolio thus changes each month. The average monthly abnormal return on the portfolio is then estimated, as the intercept from:

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

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) refers to a one-factor model; analogous regressions are estimated for the three- and four-factor models.

The calendar-time methodology presents two shortcomings, which are especially significant for our tests. First, because it forms portfolios comprising buyback stocks belonging to different countries, it forces us to rely on the "global" Fama-French factors in tests involving stocks that belong to different regions. Second, as pointed out by Fama (1998) and Loughran and Ritter (2000), because the method assigns equal importance to calendar months with many or very few buyback announcements, it can result in low power to detect abnormal performance, particularly when events cluster in time, e.g. if more firms are likely to buy back stock when their shares are undervalued. To address the latter problem, following the suggestion of Fama (1998) we estimate the calendar-time regressions with weighted least squares, with weights proportional to the number of buyback stocks comprised in the portfolio in a given calendar date. However, we can only avoid the first problem by employing the RATS methodology.

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

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

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.

Since the RATS methodology does not form portfolios, it allows us to pool buyback stocks from different countries (and thus with a different set of regional Fama-French factors) without having to resort to the "global" factors. An additional advantage is that changes in risk from before to after the repurchase, for example due to changes in leverage, are better accounted for since month by month, after the repurchase announcement, the factor loadings are allowed to change (although only in the cross-sectional average). A final advantage is that this approach allows to adjust the standard errors, clustering around nation and announcement calendar month (Petersen (2009)).[19]

B. Baseline results

Tables VI and VII and Figure 2 show long-run abnormal returns following the repurchase announcements using the RATS and calendar-time 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 the factor model, the investment horizon, and the method (RATS or calendar-time), the non-U.S. alphas are always significantly positive at the 1% level. The cumulative abnormal returns obtained with the RATS method range between 21 and 32% over a 48-month horizon (Table VI.A), broadly consistent with the monthly calendar-time alphas ranging between 0.51% and 0.74% (Table VII.A), which imply cumulative returns of 28-42%.

Panel B in Tables VI and VII breaks down the non-U.S. sample into the four Fama and French (2012) regions. With the RATS method (Table VI.B) all regions, except Europe during the first 12 months, show statistically significant (at the 1% level) alphas over all horizons and factor models. With the calendar-time method the significance is more sensitive to the factor model and the region, but with the four-factor

[19] The 48 equations in (2) are jointly estimated as a system of Seemingly Unrelated Regressions (SUR). 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 is similar to the approach of Peyer and Vermaelen (2009), if regular OLS standard errors are used.

model all excess returns are statistically significantly (at the 5% level at least) positive for all regions and all horizons. Focusing on 36-month to 48-month horizons, European buybacks tend to be followed by the smallest long-term excess returns.

Panel C in Tables VI and VII shows the results for individual countries, using the Fama-French regional four-factor model. For many countries there are only a small number of announcements, so the lack of significance of long-term excess returns in a number of cases is not unexpected. Regardless of the method used to measure excess returns, all three countries from the America ex-U.S. region (Brazil, Canada, and Mexico) show significant positive long-term excess returns over all horizons. Hence, the strength of the region is not caused by outliers. The finding that the Europe region has the smallest long-term alphas is not caused by outliers either: only two out of fifteen European countries (France and Sweden) show significant long-term excess returns after 48 months using the calendar-time method. Using the RATS method improves the statistical significance of the results, but we still only find four European countries (Sweden, Switzerland, Germany and the UK) with statistically significant (at the 5% level or less) long term (48 month) excess returns, and two countries (Greece and Spain) with significant negative excess returns. In the Asia-Pacific ex-Japan region, both RATS and calendar-time show significant long-term excess returns for Australia, India, Indonesia, and Thailand. Only when we use RATS we also find significant positive long-term excess returns in Malaysia, New Zealand, and South Korea. Note that, although not statistically significant when we use the calendar-time method, the economic magnitude is still meaningful: we find a monthly excess return of 0.26%, 0.77%, and 0.87% (using a 48-month horizon) for respectively Malaysia, New Zealand, and South Korea, corresponding to cumulative excess returns of 13%, 45%, and 52% after 4 years. The only major anomaly in Table VI.C is the significant negative long-term excess returns for Hong Kong.[20] Thus, although the existence of positive long-term excess returns seems to be

[20] This may be the result of the fact that the Hong Kong announcements are often joint announcements asking the authorization for equity issues and share buybacks.

robust at the regional level, the anomaly is clearly not present in each individual country. In our next steps, we consider whether takeovers or takeover risk can explain our results, and if the long-term excess returns have disappeared in recent years.

C. Can takeovers or takeover risk explain the long-term returns?

Several authors have related share repurchases to takeover activity. Billett 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 et al. (2017), on the other hand, based on a U.S. sample, find that long-run abnormal returns are driven by 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.

We test whether these conclusions generalize to non-U.S. buybacks. Table VIII reports long-run abnormal returns depending on whether the buyback firm has received a takeover offer in the 36 months following the buyback announcement. We identify takeover targets using the SDC database (see Internet Appendix). In our buyback sample, we classify 12.6% of all firms as targets, comprising 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 VIII reports excess returns based on a different factor model. Panel A, B and C (RATS method) and E, F, and G (calendar-time method) 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, the event study method, 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 19.3% after 48 months (panel C) and 0.7% per month (panel G) suggests that takeover bids alone cannot explain the outperformance. Moreover, the finding that a significant fraction of the U.S. abnormal returns after buybacks is related to subsequent takeovers does not 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 make a takeover bid. Indeed, undervaluation can be corrected in two ways: by the arrival of new information, or by a subsequent takeover bid.

Similar results hold when we explicitly control for takeover *risk* as suggested by Bargeron et al. (2017) and Lin et al. (2014). Indeed, if "excess" returns are a compensation for risk, it is no longer possible to argue that they reflect long-term shareholder *value.* To that end, we augment the four-factor model with the takeover factor proposed by Cremers et al. (2009) and re-estimate long-term excess returns.[21] The results, shown in panels D (RATS) and H (calendar time), show that introducing the takeover factor significantly reduces the abnormal returns of buyback firms that are takeover targets in the U.S. by 10.3%.

The fall in excess returns is consistent with the hypothesis that takeover risk is to some extent priced in U.S. markets; however, this risk factor does not fully explain excess returns. Moreover, 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% (Panel D) to 26.4% (Panel H) higher than other buyback firms.[22] However, this result is consistent with the hypothesis that buyback stocks were undervalued, and that bidders took advantage of

[21] For the U.S. sample, we use the data construction methodology of Cremers et al. (2009). We also replicate the Cremers et al. (2009) factor for non-U.S. buybacks. The takeover factor is the return on an equally weighted portfolio that is long in the quintile of firms with the highest takeover probability and short in the quintile of firms with the lowest takeover probability. We thank Alice Bonaime, Martijn Cremers, and YiLin Wu for sharing their data on the U.S. takeover risk factor returns. For the non-U.S. sample, as in Cremers et al. (2009) we estimate a logit regression to predict takeover likelihood. However, due to data availability, we replace the blockholder indicator used by Cremers et al. (2009) 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 Internet Appendix.

[22] The 26.4% 48-month return implied by the calendar-time estimates of Table VIII.H is computed as $(1 + 0.49\%)^{48} - 1 = 26.4\%$, where 0.49% is the return on U.S. buyback stocks that become takeover targets in excess of those that do not.

the undervaluation. Put differently, markets underestimate the takeover probability of some buyback stocks. Furthermore, introducing the takeover factor has no impact on the excess returns of non-U.S. firms, which do not appear to be determined by either actual takeover activity or takeover risk. Indeed, despite the lack of takeover activity, long run excess returns are not smaller in non-U.S. countries. This finding is not surprising, considering that the U.S. takeover activity is much more significant than in other countries, as documented by Rossi and Volpin (2004).

D. Did the long-term returns disappear in recent years?

Fu and Huang (2015), using buyback announcements from 2003 to 2012, find that long-term excess returns have disappeared in the U.S. in recent years. Their argument is that the market has become more efficient, so that managers no longer have inside information. This 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. This has not happened in recent years: the average abnormal return around buyback announcements is still around 3%, as it has been during the last 40 years. Possible alternative explanations for the decline in long-term excess returns can be the growing importance of bonuses tied to earnings per share (Chen et al. (2015)), or the emergence of accelerated buybacks in 2004 (Michel et al. (2010)).

To test whether indeed the anomaly has shrunk in recent years, we re-estimate excess returns using announcements from 2003 to 2010. The results in Table IX show that in the U.S. long-term returns have fallen significantly relative to the results reported in Tables VI and VII. For example, using the four-factor model, four-year post-announcement excess returns fall from 25% to 8% (panel A; similar effects obtain with the calendar-time method in panel B). However, long-term excess returns are still positive, and

generally significant. Table IX also shows the results for the non-U.S. sample. Here we see no major difference with Tables VI.A and VII.A, at least when we focus on the three- and four-factor models.

Our results are similar to Lee et al. (2015), who find that long-term excess return shrink for buybacks announced during 2002-2006, but are positive and economically large in the subsequent 2007-2011 period.[23]

The hypothesis that a general increase in market efficiency reduced market timing opportunities for managers is inconsistent with our finding that long-term excess returns have not declined outside the U.S. in recent years. Of course, this analysis is based on a shorter time period, and one 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 over 30 years of buyback announcements (Ikenberry et al. (1995), Peyer and Vermaelen (2009), and our own) do not show a systematic declining trend in long-term excess returns.[24]

E. Explaining excess returns: Market timing

The results discussed in the previous sections indicate that the long-term returns associated with the average buyback are robust. A prominent explanation for long-term excess returns in the literature is market timing, under two possible interpretations: firms buy back their undervalued stock because they believe the market has overreacted to bad news (*overreaction hypothesis*), or they buy back stock because the market is overestimating risk (*reduction in risk hypothesis*).

[23] We explored this issue further (results available upon request) by testing for long run excess returns for all U.S. buybacks announced in a specific year (starting in 1998, ending 2010). We find that excess returns start declining for announcements made in 2003 and they remain small until announcements made in 2007. However, the magnitude of long-term excess returns for announcements made during 2008-2010 is comparable to those of the early (pre-2003) sample. This is inconsistent with the hypothesis that companies were unable to time the market after 2003 because markets became more efficient. This suggests caution when drawing conclusions from a short sample period.

[24] Ikenberry et al. (1995) find that buybacks announced during 1980-1984 are followed by three-year excess returns of 16% but buybacks announced during the next five years are followed by smaller excess returns (9.21%). Peyer and Vermaelen (2009) find that three-year long-term excess returns increase to 18.6% in the 1990-2002 period. So, once we consider the whole time-period 1980-2010, there is no evidence of a systematic decline over time in U.S. excess returns.

Testing the *overreaction hypothesis* requires identifying which stocks are more likely temporarily undervalued by the market. In order to measure the likelihood of undervaluation, we use the undervaluation index (U-index) following Peyer and Vermaelen (2009), described above. We estimate the long-term excess returns for sub-samples with high and low U-index. Table X shows the results. Regardless of the time horizon, the factor model, the event study methodology, and whether the buyback is announced by a non-U.S. firm or a U.S. firm, high U-index buyback firms outperform low U-index ones. While the statistical significance is higher with the RATS methodology, the magnitude of the excess returns is very similar. For example, with the calendar-time method and the four-factor model, non-U.S. (U.S.) high U-index firms beat low U-index firms by 0.22% (0.34%) per month during the 48-month post buyback announcement, which corresponds to a four-year excess return difference of 11.1% (17.7%), results which are close to the 48-month RATS results (15.4% and 11.9% respectively). Thus, the international evidence supports the conclusions based on U.S. data.

The second interpretation of long-term excess returns is the *reduction in risk hypothesis* (Grullon and Michaely (2004)): stock prices increase 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 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 for non-U.S. buyback firms. Table XI describes their distribution. 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 factor exposures, also reported in Table XI. The results suggest that risk, in non-U.S. buyback firms, does not go down systematically. Thus, the average long-run abnormal returns in our sample of non-U.S. buybacks cannot be attributed to markets underreacting to changes in risk after the buyback announcement.

F. Cross-sectional determinants of long-term excess returns

The conclusion from the previous sections is that long-term excess returns following non-U.S. buybacks appear stronger when managers time the market, and the buyback is announced when the stock price is temporarily undervalued. The results on long-term returns in individual countries, moreover, suggest that buyback announcements are not always followed by positive long-term returns. We now follow the spirit of Table V, and consider a number of company- and country-specific mediating factors, which can reconcile these findings. At the same time, this approach allows us to test the robustness of our previous results to a broad set of control variables.

The country-specific factors we consider are the same as in Table V, but we include additional firm-specific factors: a "Takeover target" indicator equal to 1 if the buyback firm becomes a target within 36 months of the buyback announcement; the change in beta over a (-36,+36)-months window around the buyback announcement, following Grullon and Michaely (2004); the 1 year buyback completion rate (estimated as explained in the Internet Appendix); and an indicator equal to 1 if the firm makes a "follow up" buyback announcement in the period over which we compute the long-term excess returns, as Bargeron et al. (2017) argue that higher long-run excess returns are observed after follow-up buyback announcements.

We obtain estimates of the long-run risk-adjusted returns for individual buyback firms in the spirit of Brennan et al. (1998) as follows. For a given stock in a given calendar month, the risk-adjusted return is computed as the risk-free rate of return plus the residual from a regression of the stock's excess return on

the four-factor model.[25] Risk-adjusted returns are then averaged over the 36-month period following the buyback announcement date, obtaining the risk-adjusted average monthly returns. These returns are used as the dependent variables in the regressions reported in Table XII.

The regressions follow the layout of Table V. Columns (1) through (4) and (6) only contain non-U.S. buybacks, while columns (5) and (7) are based on all announcements. As in Table V, and confirming the results of Table X, the U-index is significantly positively related to long-term excess returns in all regression specifications. The takeover target indicator is only significant including U.S. buybacks, confirming the univariate results in Table VIII, and likewise for the change in beta, consistent with the results of Table XI. Interestingly, firms with higher completion rates have smaller long-term excess returns, although the effect is weakly significant. We further explore this issue in the next section, where we test for the determinants of completion rates. Highly levered firms have smaller excess returns, which is consistent with some of the criticism that companies underestimate the costs of financial distress when levering up to buy back stock. Finally, consistent with Bargeron et al. (2017) long-term excess returns after buybacks are to a large extent a result of subsequent buyback announcements. This effect is robust in all regression specifications.

The only country-level characteristic that appears robustly related to long-term excess returns is Lambda, measuring the average illiquidity in a given country (Fong et al. (2017)). One interpretation is that illiquidity reflects informational opacity and relative market inefficiency, and that drives underreaction to the buyback announcement. Corporate governance quality could matter for long-term excess returns if good governance is necessary for managers to take advantage of undervaluation. In other words, only firms with good corporate governance are interested in an activity that reduces excess cash to benefit long-term shareholders. We find that corporate governance quality is positively related to long-term returns, with

[25] The regression is estimated on the entire 1998-2014 period. The results are not sensitive to the factor model, but we only show the four-factor results for brevity.

positive coefficients on the Anti-director index and negative on the Leuz et al. index, but the effects are not robust across different specifications.

In sum, we find evidence that undervaluation as well as some country characteristics matter for long-term excess returns. Buybacks tend to be followed by higher long-term returns when the announcing firm has a high U-index and low leverage, in illiquid markets, and to a lesser extent in countries with better corporate governance quality.

G. What determines completion rates?

An open market buyback program is an option, not a firm commitment; and our evidence of Table III shows that, even across different countries, there are important differences in the actual completion rates. Why do firms complete (or fail to complete) a buyback program? In this case, our analysis is more exploratory in nature, given that the literature has largely focused on explanations of announcement and long-term returns.

We run a series of regressions with similar layout as Table XII, reported in Table XIII. Completion rates are *lower* for firms with a higher U-index, and in countries with high incidence of stock option compensation for managers, a larger dividend tax disadvantage, and more concentrated ownership. These effects become insignificant once we include U.S. buybacks in specifications (5) and (7); in contrast, those regressions indicate that completion rates are higher when the buyback firm becomes a takeover target, consistent with the takeover deterrence hypothesis and the evidence of Table VIII. As expected, the larger the percentage of shares sought, the less likely the buyback will be completed.

These results suggest that, at least outside the U.S., firms that buy back stock for other reasons than undervaluation (saving personal taxes on dividends, fighting takeover bids, avoiding dilution in EPS from stock options) tend to complete buybacks. When firms initially announce a buyback because they believe the shares are undervalued they will not complete the buyback if the stock price subsequently becomes

efficient (Ikenberry et al. (2000)). Such tactical behavior may explain the combined results of Tables XII and XIII.

VI. Conclusion

Following a recent wave of criticism of share buybacks, we take to the data the claim that buybacks destroy value, at the expense of long-term investors. To study long-term value, we look at the returns over a four-year period following share buyback announcements. To make sure that the outcome of our tests is not driven by a small sample or data snooping, we consider the broadest possible sample, looking at buyback announcements made by firms in 31 non-U.S. countries plus the U.S.

On average, share buybacks around the world are associated with positive announcement returns and are followed by 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.

Not all buybacks are equal though, and we observe important differences in announcement and long-term returns in the cross-section. The positive short- and long-run excess returns are more pronounced for small, beaten-up, value stocks, suggesting undervaluation as a main factor driving the buyback announcement and subsequent returns. The relationship is not causal; but it does suggest that any real negative consequences associated with the buyback are smaller than the initial undervaluation. Especially in the long run, country-specific factors such as stock market liquidity appear to relate to the stock performance following the buyback announcement.

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Table I
Studies on Buybacks in Non-U.S. Countries – Review

The table reports an overview of short-run (Panel A) and long-run (Panel B) event studies on buybacks in non-US countries. In Panel A, to make results comparable, cumulative average abnormal returns over a 3-day period (-1,+1) are calculated using the information in the study (if available). Panel B shows the results of long-run event studies, reporting the magnitude of long-term excess returns on different horizons, their significance, and the methodologies used in the estimation, including the factor model (Fama and French (1993) FF 3-factor model, Carhart (1997) FFC 4-factor model, or other).

A. Short-Run Event Studies

Country	Study	Abnormal returns (period)	Sample size	Period
Australia	Lamba and Ramsay (2000)	3.30% (-1,+1)	103	1989-1998
	Ochere and Ross (2002)	4.30% (-1,+1)	132	1991-1999
	Ekanayake (2004)	2.73% (-1,+1)	206	2000-2003
	Brown (2007)	3.67% (-1,+1)	28	1996-2003
Brazil	Moreira and Procianoy (2001)	0.03% (-1,+1)	110	1997-1998
	Micheloud (2013)	1.7%(0,+5)	377	2006-2012
Belgium	Van Holder and Van de Kerkhove (2015)	1.20% (-1,+1)	38	2011-2014
Canada	Li and McNally (2007)	0.73% (-1,+2)	901	1987-2000
	Mishra et al. (2010)	1.79% (-2,+2)	2,228	1994-2005
China	Gan et al. (2017)	2.84% (-1,+1)	417	2000-2012
Finland	Karhunen (2002)	1.86% (-1,+1)	155	1997-2001
France	Ginglinger and L'Her (2006)	0.70% (-1,+1)	363	1998-1999
	Lee et al. (2010)	0.20% (-1,+1)	220	1990-2005
	Andriosopulos and Lasfer (2015)	0.80% (-1,+1)	263	1997-2006
Germany	Seifert and Stehle (2003)	4.80% (-1,+1)	188	1998-2003
	Hackethal and Zdantchouk (2006)	2.53% (-1,+1)	224	1998-2003
	Lee et al. (2010)	3.58% (-1,+1)	115	1990-2005
	Andriosopulos and Lasfer (2015)	2.32% (-1,+11)	194	1997-2006
Italy	Lee et al. (2010)	1.93% (-1,+1)	51	1990-2005
India	Bhargava and Agrawal (2015)	1.00% (-1,+1)	42	2010-2014
	Chatterjee and Dutta (2015)	1.81% (-1, +1)	95	2009-2013
Japan	Zhang (2002)	6.00% (-1,+2)	39	1995-1999
Korea	Jung et al. (2005)	2.80% (0,+5)	382	1994-1998
Malaysia	Chong et al. (2015)	0.73% (0,+2)	100	2007-2011
	Latif et al. (2014)	0.00% (-1,+1)	77	1999-2006
	Isa and Lee (2014)	0.77% (-1,+1)	289	1997-2007
Netherlands	Van Holder and Van de Kerkhove (2015)	-0.22% (-1, +1)	140	2011-2014
New Zeland	Koerniadi (2005)	4.00% (-1,+1)	37	1995-2004
Norway	Skjeltorp (2004)	2.52% (-2,+2)	318	1998-2001
Poland	Gurgul and Majdosz (2005)	0.90% (-1,+1)	20	2000-2004
	Hatakeda and Isagawa (2004)	2.43% (-1,+1)	452	1995-1998
Switzerland	Chung et al. (2007)	1.80% (-2,+2)	10	1999-2003
Sweden	Rasbrandt and Jonas (2013)	1.94% (0,+1)	126	2000-2009
Taiwan	Liao et al. (2005)	2.90% (-1,+1)	214	2000-2001
	Wang et al. (2013)	1.91% (-1,+2)	3,022	2000-2010
Thailand	Nittayagasetwat and Nittayagasetwat (2013)	2.82% (-1,+1)	88	2001-2012
United Kingdom	Rau and Vermaelen (2002)	1.10% (-5,+5)	246	1985-2000
	Oswald and Young (2004)	1.40% (-1,+1)	266	1995-2000
	Lee et al. (2010)	0.80% (-1,+1)	126	1990-2005
	Crawford and Wang (2012)	1.33% (-2,+2)	468	1999-2004
	Andriosopulos and Lasfer (2015)	1.68% (-1,+1)	513	1997-2006

Table I Studies on Buybacks in Non-U.S. Countries – Review – continued

B. Long-Run Event Studies

Country	Study	Empirical approach	Time period	Type of event	Number	Year 1	Year 2	Year 3
Canada	Ikenberry et al. (2000)	FF 3 factor (calendar time)	1989-1997	Authorization	1,060	0.70% (t = 2.98)	0.69% (t = 2.58)	0.58% (t = 2.03)
	McNally and Smith (2007)	FF 3 factor (calendar time)	1987-2000	Authorization	2,129	0.02% (p = 0.90)	0.22% (p = 0.21)	0.34% (p = 0.09)
Hong Kong	Zhang (2005)	BHAR adjusted for size and book-to-market	1993-1997	Actual	813	2.02% (p = 0.40)	1.82% (p = 0.63)	-1.39% (p = 0.73)
Japan	Ishiwaka and Takahashi (2011)	5 factor model combining FFC's 4 factors and Pastor and Stambaugh's (2003) illiquidity factor (calendar time)	2001-2008	Actual	2,437	0.28% (t = 3.68)	0.26% (t = 3.42)	0.24% (t = 3.00)
Korea	Jung et al. (2005)	FF 3 factor (calendar time)	1994-2000	Authorization	268	0.60% (t = 0.80)	-0.25% (t = -0.39)	-0.03% (t = -0.47)
Malaysia	Albaity and Said (2016)	BHAR adjusted for size and book-to-market	2009-2010	Actual	221	4.39% (t = 1.25)	7.93% (t = 1.21)	4.14% (t = 0.61)
Norway	Skjeltorp (2004)	FFC 4 factor (calendar time)	1998-2001	Authorization	318	0.16% (t = 0.27)	0.72% (t = 1.99)	0.94% (t = 2.29)
South Africa	Wesson (2015)	BHAR adjusted for size, book-to-market, and industry	1999-2009	Actual	204	28.00% (p = 0.04)	33.00% (p = 0.00)	26.00% (p = 0.00)
Sweden	Rasbrant (2013)	FFC 4 factor (IRATS)	2000-2009	Authorization	126	7.43% (t = 3.20)	9.21% (t = 2.03)	NA
Taiwan	Wang et al. (2013)	FF 3 factor (calendar time)	2000-2010	Authorization	620	NA	NA	0.54% (p = 0.014)
	Lin and Su (2014)	FFC 4 factor (calendar time)	2000-2003	Actual	303	-1.76% (t=-3.65)	-1.40% (t = -4.28)	-1.04% (t = -3.00)
Thailand	Vithessonthi (2008)	BHAR adjusted for size and book-to-market	2001-2005	Authorization	21	-3.31% (t = -0.40)	-17.96% (t = -0.54)	26.50% (t = 1.46)
United Kingdom	Rau and Vermaelen (2002)	BHAR adjusted for size and book-to-market	1985-1998	Authorization	57	-7.00% (p = 0.08)	NA	NA
	Oswald and Young (2004)	BHAR adjusted for size and book-to-market	1985-2000	Authorization	257	4.54% (p = 0.04)	NA	NA
	Crawford and Wang (2012)	BHAR adjusted for size and book-to-market	1999-2004	Authorization	468	2.71% (p = 0.09)	10.44% (p = 0.00)	NA
Multiple countries	Timmer (2007)	FF 3 factor (calendar time)	1992-2006	Authorization	275	NA	NA	0.58% (p = 0.00)

Table II
Summary Statistics

The table reports summary statistics on 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.

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.	9,034	5,620	1.6	11	2.4	7.7	4.5	0.1	50.0
United States	11,096	4,686	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	2,298	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	3,037	1,774	1.7	9	4.8	6.8	4.7	0.1	49.8

Table III
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. Buyback completion rates are estimated following the procedure described in the Internet Appendix.

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 IV Announcement Returns

The table reports the cumulative abnormal returns around the sample of open-market repurchase announcements, 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. 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 V
Announcement Returns – Cross-Sectional Regressions

The table reports the estimates of a regression of the cumulative abnormal announcement returns on *Firm-specific factors* and *Country-level factors*. Whenever a given country factor is missing, the corresponding observations are replaced by a 0, and a missing country factor indicator set equal to 1. Specification (1) also includes an intercept, omitted from the table for brevity. Columns (1)-(4) and (6) only include non-U.S. buybacks; (5) and (7) also include U.S. buybacks. The standard errors are clustered around nations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Firm-specific factors			
U-index	0.0024***	0.0024***	0.0025***	0.0029***	0.0066***	0.0027***	0.0065***
	(2.83)	(4.60)	(4.84)	(4.90)	(2.86)	(5.20)	(2.81)
Leverage	0.0011	0.0029	0.0037	0.0029	-0.0085	0.0031	-0.0083
	(0.16)	(0.50)	(0.64)	(0.50)	(-1.23)	(0.53)	(-1.22)
Dividend payout	-0.0013	-0.0019	-0.0002	-0.0019	-0.0129*	-0.0019	-0.0123
	(0.15)	(-0.24)	(-0.03)	(-0.28)	(-1.76)	(-0.27)	(-1.69)
Percentage sought	0.0136	0.0202	0.0292**	0.0368***	0.0432***	0.0309***	0.0452***
	(0.55)	(0.88)	(2.49)	(3.66)	(11.87)	(3.01)	(15.80)
Subsequent buyback	-0.0095***	-0.0098***	-0.0122***	-0.0132***	-0.0103***	-0.0133***	-0.0107***
	(5.04)	(-5.80)	(-9.03)	(-7.88)	(-5.33)	(-7.74)	(-5.24)
				Country-level factor			
Anti-director index						0.0076**	0.0017
						(2.14)	(0.59)
Leuz et al. index						0.0011***	0.0006
						(2.76)	(1.50)
Board approval (Y/N)						0.0373***	0.0254***
						(4.45)	(2.96)
Dividend tax disadvantage						0.0388***	0.0135
						(2.88)	(1.09)
Option compensation						-0.0173	-0.0239
						(1.24)	(-1.40)
Diffuse ownership						-0.0123	0.0002
						(1.16)	(0.01)
Lambda						0.0001	0.0004
						(0.08)	(0.21)
Analysts						0.0049**	0.0034**
						(2.74)	(2.43)
Inst. ownership						-0.1193**	0.0435
						(2.40)	(1.63)
Missing country char. indicators		Y	Y	Y	Y	Y	Y
Industry-year f.e.		Y	Y	Y	Y	Y	Y
Region-year f.e.			Y	Y		Y	Y
Nation-year f.e.				Y	Y		
N. obs.	5,673	5,668	5,668	5,615	9,364	5,668	9,417
R^2	0.007	0.025	0.036	0.072	0.074	0.050	0.065

Table VI
Long-Run Returns (RATS 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. Panel C reports the cumulative alphas at the nation level, estimated again using the Fama-French regional factors. In all panels, the standard errors are clustered around country and announcement calendar month. The columns labeled "p-value" report the p-values associated with the chi-square test statistic for the cumulative alphas.

A. RATS 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. RATS 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 VI Long-Run Returns (RATS Method) – cont'd

C. RATS Long-Run Returns by Nation

Nation	Alpha (12 months)	p-value	Alpha (24 months)	p-value	Alpha (36 months)	p-value	Alpha (48 months)	p-value
				Region: America Ex-U.S.				
Brazil	30.19***	(0.00)	61.85***	(0.00)	69.63***	(0.00)	83.89***	(0.00)
Canada	9.10***	(0.00)	18.86***	(0.00)	30.23***	(0.00)	37.85***	(0.00)
Mexico	10.99	(0.15)	33.42***	(0.00)	32.05***	(0.00)	37.38***	(0.01)
				Region: Asia-Pacific Ex-Japan				
Australia	11.62***	(0.00)	22.93***	(0.00)	30.15***	(0.00)	39.62***	(0.00)
China	8.74	(0.15)	6.40	(0.40)	1.13	(0.91)	12.92	(0.29)
Hong Kong	-0.73	(0.84)	-16.50***	(0.00)	-25.82***	(0.00)	-12.53*	(0.05)
India	22.64***	(0.00)	55.33***	(0.00)	73.54***	(0.00)	89.82***	(0.00)
Indonesia	17.98*	(0.06)	42.42**	(0.01)	61.19***	(0.00)	64.22***	(0.00)
Malaysia	2.32	(0.46)	1.52	(0.72)	8.35	(0.10)	13.59**	(0.02)
New Zealand	13.36**	(0.05)	24.52**	(0.01)	19.95	(0.14)	29.79**	(0.01)
Philippines	59.25	(0.32)	65.25	(0.26)	85.22	(0.13)	113.68	(0.11)
Singapore	-3.39	(0.70)	-22.79**	(0.04)	-29.65*	(0.06)	-31.90	(0.11)
South Korea	4.09	(0.35)	22.03***	(0.00)	17.64**	(0.03)	22.28**	(0.04)
Taiwan	-10.35**	(0.03)	-10.34	(0.10)	-8.61	(0.24)	-5.63	(0.44)
Thailand	15.55***	(0.00)	56.64***	(0.00)	63.45***	(0.00)	80.46***	(0.00)
				Region: Europe				
Austria	1.88	(0.75)	-0.08	(0.99)	6.32	(0.46)	8.88	(0.37)
Belgium	-1.22	(0.83)	-5.41	(0.44)	-5.65	(0.59)	-9.01	(0.48)
Denmark	-2.57	(0.53)	14.71**	(0.02)	21.19***	(0.00)	11.89	(0.23)
Finland	-4.43	(0.44)	5.87	(0.52)	18.41	(0.12)	25.69*	(0.09)
France	5.44**	(0.05)	7.70*	(0.05)	7.23	(0.16)	10.37*	(0.08)
Germany	-0.34	(0.93)	6.31	(0.25)	12.49*	(0.05)	20.79**	(0.01)
Greece	-30.74***	(0.00)	-31.12**	(0.03)	-23.57*	(0.09)	-52.65***	(0.00)
Israel	7.93	(0.46)	26.98*	(0.07)	4.84	(0.79)	14.36	(0.48)
Italy	8.86*	(0.07)	13.47**	(0.04)	5.71	(0.45)	1.64	(0.85)
Netherlands	9.41***	(0.00)	14.73**	(0.01)	10.14	(0.21)	7.79	(0.40)
Norway	8.51	(0.29)	15.06*	(0.08)	16.93	(0.17)	-0.77	(0.96)
Spain	1.25	(0.82)	-9.02	(0.25)	-18.93*	(0.05)	-23.03**	(0.02)
Sweden	10.95**	(0.02)	35.39***	(0.00)	46.65***	(0.00)	51.45***	(0.00)
Switzerland	0.91	(0.70)	5.24	(0.14)	11.17**	(0.02)	19.50***	(0.00)
United Kingdom	5.08	(0.15)	15.77***	(0.00)	14.89**	(0.01)	18.15**	(0.01)
				Region: Japan				
Japan	5.85***	(0.00)	10.85***	(0.00)	14.29***	(0.00)	16.41***	(0.00)

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. Panel C reports the calendar-time alphas at the nation level, estimated again using the Fama-French regional factors and a four-factor model. In all panels, the models are estimated with weighted least squares, with weights proportional to the number of buyback firms comprised in the calendar-time portfolios at any given month.

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	1.01***	(4.53)	0.94***	(4.94)	0.84***	(5.16)	0.74***	(4.99)
Three-factor model	0.63***	(3.75)	0.61***	(4.30)	0.56***	(4.72)	0.51***	(4.80)
Four-factor model	0.71***	(4.34)	0.71***	(5.13)	0.65***	(5.53)	0.60***	(5.73)
U.S. buybacks								
One-factor model	0.54**	(2.54)	0.80***	(3.96)	0.93***	(4.74)	0.93***	(4.78)
Three-factor model	0.36**	(2.31)	0.46***	(3.31)	0.51***	(3.65)	0.53***	(3.66)
Four-factor model	0.54***	(4.91)	0.57***	(5.45)	0.59***	(5.29)	0.60***	(4.83)

B. Calendar-Time Alphas by Region

Region	Alpha (12 months)	t-stat	Alpha (24 months)	t-stat	Alpha (36 months)	t-stat	Alpha (48 months)	t-stat
One-Factor Model								
America Ex-U.S.	1.06***	(3.27)	1.14***	(3.95)	1.18***	(4.37)	1.08***	(4.31)
Asia-Pacific Ex-Japan	0.68**	(2.39)	0.40*	(1.78)	0.25	(1.27)	0.37**	(2.06)
Europe	0.28	(1.59)	0.44***	(2.96)	0.43***	(3.17)	0.43***	(3.37)
Japan	1.07***	(4.82)	1.04***	(5.21)	0.89***	(4.86)	0.69***	(3.97)
Three-Factor Model								
America Ex-U.S.	0.80***	(2.61)	0.85***	(3.14)	0.87***	(3.45)	0.82***	(3.45)
Asia-Pacific Ex-Japan	0.57**	(2.25)	0.34*	(1.69)	0.25	(1.52)	0.40***	(2.66)
Europe	0.16	(1.26)	0.27**	(2.49)	0.21**	(2.25)	0.20**	(2.42)
Japan	0.47***	(3.94)	0.46***	(4.57)	0.41***	(4.59)	0.35***	(4.28)
Four-Factor Model								
America Ex-U.S.	0.81***	(2.65)	0.86***	(3.15)	0.87***	(3.44)	0.81***	(3.43)
Asia-Pacific Ex-Japan	0.64**	(2.57)	0.45**	(2.34)	0.37**	(2.31)	0.51***	(3.44)
Europe	0.33***	(2.89)	0.42***	(4.14)	0.33***	(3.66)	0.30***	(3.62)
Japan	0.43***	(3.64)	0.41***	(4.32)	0.38***	(4.54)	0.34***	(4.39)

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

C. Calendar-Time Alphas by Nation

Nation	Alpha (12 months)	t-stat	Alpha (24 months)	t-stat	Alpha (36 months)	t-stat	Alpha (48 months)	t-stat
			Region: America Ex-U.S.					
Brazil	2.66**	(2.37)	2.57***	(2.76)	1.88**	(2.43)	1.71**	(2.55)
Canada	0.76*	(1.95)	0.78**	(2.22)	0.83**	(2.54)	0.78**	(2.57)
Mexico	0.79	(1.11)	1.31**	(2.38)	0.76*	(1.70)	0.70*	(1.81)
			Region: Asia-Pacific Ex-Japan					
Australia	0.95***	(3.39)	0.95***	(3.80)	0.84***	(3.80)	0.84***	(4.27)
China	0.70	(1.00)	0.23	(0.47)	-0.07	(-0.15)	0.15	(0.33)
Hong Kong	-0.03	(-0.05)	-0.47	(-1.16)	-0.58	(-1.64)	-0.25	(-0.75)
India	1.83**	(2.28)	2.18***	(2.93)	1.93***	(2.64)	1.75**	(2.52)
Indonesia	1.57	(1.28)	2.18**	(2.44)	2.40***	(2.74)	2.10**	(2.50)
Malaysia	0.08	(0.16)	0.08	(0.19)	0.23	(0.60)	0.26	(0.69)
New Zealand	1.16*	(1.80)	0.90*	(1.84)	0.68	(1.57)	0.77*	(1.81)
Philippines	3.89	(0.87)	2.28	(1.02)	2.22	(1.43)	2.28*	(1.87)
Singapore	-1.12	(-1.31)	-0.94	(-1.52)	-0.97*	(-1.79)	-0.72	(-1.43)
South Korea	0.40	(0.32)	0.69	(0.71)	0.62	(0.78)	0.87	(1.16)
Taiwan	-0.92	(-1.41)	-0.56	(-0.94)	-0.34	(-0.60)	-0.24	(-0.43)
Thailand	1.32**	(1.97)	2.35***	(3.38)	1.82***	(3.04)	1.82***	(3.39)
			Region: Europe					
Austria	0.17	(0.34)	-0.17	(-0.41)	0.05	(0.15)	0.13	(0.46)
Belgium	0.24	(0.54)	-0.02	(-0.04)	0.07	(0.26)	0.01	(0.05)
Denmark	-0.15	(-0.24)	0.78*	(1.85)	0.77**	(2.05)	0.46	(1.48)
Finland	-0.30	(-0.59)	0.23	(0.46)	0.41	(1.01)	0.48	(1.34)
France	0.60***	(2.68)	0.51**	(2.09)	0.33	(1.57)	0.33**	(2.00)
Germany	-0.07	(-0.17)	0.13	(0.35)	0.24	(0.78)	0.34	(1.13)
Greece	-2.21**	(-2.37)	-1.14	(-1.65)	-0.75	(-1.19)	-1.12*	(-1.87)
Israel	1.11	(0.90)	1.24	(1.28)	0.68	(0.89)	0.54	(0.74)
Italy	0.58	(1.46)	0.41	(1.32)	0.11	(0.40)	-0.01	(-0.02)
Netherlands	0.66	(1.49)	0.56*	(1.79)	0.25	(0.92)	0.08	(0.28)
Norway	0.38	(0.55)	0.49	(1.11)	0.27	(0.72)	-0.03	(-0.09)
Spain	0.22	(0.37)	-0.21	(-0.47)	-0.45	(-1.26)	-0.41	(-1.22)
Sweden	1.04***	(3.04)	1.45***	(5.25)	1.31***	(5.66)	1.15***	(5.42)
Switzerland	0.04	(0.13)	0.16	(0.75)	0.26	(1.05)	0.34	(1.47)
United Kingdom	0.36	(1.05)	0.63**	(2.12)	0.47*	(1.79)	0.42*	(1.85)
			Region: Japan					
Japan	0.43***	(3.19)	0.41***	(4.10)	0.38***	(4.22)	0.34***	(3.93)

Table VIII
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) RATS method (panels A-D, where cumulative abnormal returns are reported) and the calendar-time method (panels E-H, where monthly abnormal returns are reported). In all panels, the first four columns exclude U.S. buybacks, and the next four focuse on U.S. buybacks. 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 calendar-time alphas are based on regressions of portfolio returns on the Fama-French global factors, and the regressions are estimated with weighted least squares, with weights proportional to the number of buyback firms comprised in the calendar-time portfolios at any given month.

	Non-U.S. buybacks				**U.S. buybacks**			
Months relative to ann. date	**(+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 VIII Long-Run Returns and Takeover Targets – cont'd

	Non-U.S. buybacks				U.S. buybacks			
Months relative to ann. date	**(+1,+12)**	**(+1,+24)**	**(+1,+36)**	**(+1,+48)**	**(+1,+12)**	**(+1,+24)**	**(+1,+36)**	**(+1,+48)**
				E. One-factor model				
Takeover target	1.05***	1.14***	0.85***	0.74***	1.01***	1.35***	1.62***	1.51***
	(3.04)	(4.15)	(3.81)	(3.80)	(3.87)	(5.72)	(6.95)	(6.61)
Not takeover target	1.08***	0.98***	0.88***	0.77***	0.46	0.75***	0.87***	0.88***
	(4.30)	(4.55)	(4.70)	(4.49)	(1.96)	(3.45)	(4.13)	(4.26)
Target – Not target	-0.03	0.16	-0.02	-0.03	0.55***	0.60***	0.75***	0.67***
	(-0.12)	(0.82)	(-0.15)	(-0.21)	(4.32)	(5.90)	(7.17)	(6.52)
				F. Three-factor model				
Takeover target	0.72**	0.85***	0.61***	0.54***	0.78***	1.01***	1.17***	1.04***
	(2.19)	(3.22)	(2.86)	(2.97)	(3.26)	(4.87)	(5.73)	(5.27)
Not takeover target	0.67***	0.59***	0.53***	0.47***	0.26	0.49**	0.56***	0.57***
	(3.18)	(3.38)	(3.57)	(3.54)	(1.18)	(2.44)	(2.83)	(2.91)
Target – Not target	0.06	0.26	0.09	0.08	0.52***	0.53***	0.62***	0.52***
	(0.20)	(1.26)	(0.51)	(0.53)	(4.08)	(5.24)	(6.05)	(5.28)
				G. Four-factor model				
Takeover target	0.69**	0.84***	0.61***	0.53***	1.00***	1.18***	1.33***	1.18***
	(2.10)	(3.18)	(2.80)	(2.86)	(4.49)	(6.03)	(6.93)	(6.44)
Not takeover target	0.70***	0.63***	0.57***	0.51***	0.50**	0.65***	0.70***	0.70***
	(3.36)	(3.69)	(3.84)	(3.86)	(2.54)	(3.47)	(3.82)	(3.78)
Target – Not target	-0.01	0.21	0.04	0.02	0.51***	0.53***	0.62***	0.53***
	(-0.03)	(1.05)	(0.23)	(0.15)	(3.89)	(5.19)	(6.05)	(5.35)
				H. Four-factor + Takeover factor model				
Takeover target	0.73**	0.87***	0.63***	0.55***	0.75***	0.89***	1.02***	0.93***
	(2.31)	(3.36)	(3.03)	(3.07)	(3.57)	(4.91)	(5.80)	(5.42)
Not takeover target	0.71***	0.64***	0.58***	0.52***	0.28	0.42**	0.44**	0.44**
	(3.47)	(3.80)	(4.02)	(4.04)	(1.51)	(2.36)	(2.54)	(2.57)
Target – Not target	0.02	0.22	0.05	0.03	0.47***	0.47***	0.58***	0.49***
	(0.07)	(1.13)	(0.32)	(0.21)	(3.53)	(4.51)	(5.46)	(4.85)

Table IX
Long-Run Returns in Recent Years (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 (panel A, where cumulative abnormal returns are reported) and the calendar-time method (panel B, where monthly abnormal returns are reported), restricting the sample to non-U.S. buyback announcements made after 2002, in addition to U.S. buybacks over the same period. In panel A, the standard errors are clustered around country and announcement calendar month.

A. RATS Method

	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)

B. Calendar-Time Method

	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	1.13***	(4.66)	0.94***	(5.48)	0.77***	(5.90)	0.64***	(4.60)
Three-factor model	0.68***	(3.44)	0.56***	(4.05)	0.47***	(4.51)	0.40***	(3.31)
Four-factor model	0.68***	(3.47)	0.59***	(4.32)	0.51***	(4.93)	0.48***	(4.00)
U.S. buybacks								
One-factor model	0.32*	(1.77)	0.37***	(2.60)	0.38***	(3.11)	0.44***	(3.85)
Three-factor model	0.17	(0.97)	0.23	(1.64)	0.22*	(1.94)	0.29***	(2.61)
Four-factor model	0.27*	(1.76)	0.29**	(2.43)	0.32***	(3.05)	0.39***	(3.70)

Table X
Long-Run Returns and Undervaluation

The table reports the long-run abnormal returns on portfolios of repurchasing firms, obtained using the Ibbotson (1975) Returns Across Time and Securities (RATS) method (panels A and B, where cumulative returns are reported) and the calendar-time method (panels C and D, where monthly abnormal returns are reported). The estimates are based on U.S. dollar returns. In panels A and B, the Fama-French regional factors are used, in panels C and D, the global factors. In panels A and C, the sample is restricted to share buybacks announced outside the United States. In panel B and D, 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 all 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 Internet 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. In panels A and B, 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. In these panels, 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. In panels C and D, monthly alphas and the associated test statistics are reported. The alphas are estimated with weighted least squares, with weights proportional to the number of buyback firms comprised in the calendar-time portfolios at any given month.

	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 (RATS)							
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)
					B. U.S. Buybacks (RATS)							
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)

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)**
C. Non-U.S. Buybacks (Calendar-time)												
High U-index	1.23***	1.23***	1.15***	1.00***	0.66**	0.70***	0.67***	0.59***	0.71**	0.75***	0.72***	0.63***
	(3.55)	(4.24)	(4.71)	(4.45)	(2.25)	(2.87)	(3.37)	(3.37)	(2.42)	(3.16)	(3.65)	(3.58)
Low U-index	0.90***	0.92***	0.81***	0.68***	0.46**	0.50***	0.45***	0.38***	0.48***	0.53***	0.48***	0.41***
	(3.95)	(4.55)	(4.63)	(4.24)	(2.57)	(3.16)	(3.28)	(3.09)	(2.64)	(3.36)	(3.50)	(3.36)
High – Low U-index	0.34*	0.31**	0.34***	0.32***	0.20	0.19	0.22**	0.21**	0.23	0.22	0.24**	0.22**
	(1.84)	(2.24)	(3.02)	(2.99)	(1.11)	(1.40)	(2.01)	(2.06)	(1.29)	(1.62)	(2.18)	(2.11)
D. U.S. Buybacks (Calendar-time)												
High U-index	0.97**	1.32***	1.35***	1.20***	0.68*	1.00***	1.02***	0.85***	1.15***	1.25***	1.22***	1.03***
	(2.38)	(3.75)	(4.14)	(4.05)	(1.76)	(3.14)	(3.44)	(3.16)	(3.41)	(4.18)	(4.42)	(4.08)
Low U-index	0.52**	0.80***	0.92***	0.87***	0.32	0.52***	0.58***	0.53***	0.52***	0.67***	0.72***	0.66***
	(2.33)	(3.80)	(4.50)	(4.37)	(1.54)	(2.70)	(3.06)	(2.87)	(2.74)	(3.68)	(4.02)	(3.79)
High – Low U-index	0.45	0.52**	0.43*	0.30	0.36	0.48**	0.43**	0.29*	0.63**	0.58***	0.51***	0.34**
	(1.57)	(2.09)	(1.93)	(1.56)	(1.30)	(2.15)	(2.22)	(1.67)	(2.41)	(2.63)	(2.63)	(2.03)

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 (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 – Cross-sectional Regressions

The table reports the estimates of a regression of firm-level long-run returns on *Firm-specific factor* and *Country-level factors*. Whenever a given country factor is missing, the corresponding observations are replaced by a 0, and a missing country factor indicator set equal to 1. Specification (1) also includes an intercept, omitted from the table for brevity. Columns (1)-(4) and (6) only include non-U.S. buybacks; (5) and (7) also include U.S. buybacks. The standard errors are clustered around nations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Firm-specific factors				
U-index	0.0843**	0.0789**	0.0801**	0.0834**	0.0577*	0.0863**	0.0620**
	(2.60)	(2.30)	(2.07)	(2.11)	(1.85)	(2.32)	(2.05)
Leverage	-0.4764***	-0.5288***	-0.4920***	-0.5197***	-0.8405***	-0.5032***	-0.8632***
	(5.08)	(-4.18)	(-3.66)	(-3.81)	(-4.10)	(-3.89)	(-4.26)
Dividend payout	-0.1660	-0.1613	-0.0715	-0.1029	-0.2476*	-0.0786	-0.1775*
	(0.90)	(-1.43)	(-0.75)	(-1.14)	(-1.81)	(-0.84)	(-1.74)
Percentage sought	2.3892*	2.5503**	2.7293**	1.8012*	-0.2848	2.1887**	-0.1971
	(1.83)	(2.14)	(2.37)	(1.94)	(-0.39)	(2.26)	(-0.25)
Subsequent buyback	0.1474*	0.1251*	0.0424	-0.0042	-0.0173	0.0327	0.0199
	(1.82)	(1.95)	(0.69)	(-0.09)	(-0.57)	(0.61)	(0.54)
Change in beta	0.0016	0.0012	0.0011	0.0009	0.0002**	0.0010	0.0002***
	(1.08)	(0.71)	(0.67)	(0.52)	(2.45)	(0.65)	(2.90)
Takeover target	0.1626**	0.0779	0.0246	-0.0255	0.8742**	0.0332	0.8786**
	(2.27)	(0.82)	(0.25)	(-0.26)	(2.66)	(0.32)	(2.73)
1yr completion	-0.0007	-0.0017	-0.0016	-0.0016	-0.0025*	-0.0015	-0.0027*
	(0.38)	(-0.95)	(-0.99)	(-0.94)	(-1.74)	(-0.96)	(-2.03)
Buyback has follow-up	0.2491***	0.1863***	0.1978***	0.2420***	0.2723***	0.2129***	0.2407***
	(4.69)	(3.61)	(3.80)	(6.08)	(7.02)	(4.49)	(5.37)

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Table XII Long Run Returns – Cross-sectional Regressions - continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Country-level factors				
Anti-director index						0.0031	0.1512*
						(0.03)	(1.73)
Leuz et al. index						-0.0286*	-0.0102
						(1.91)	(-0.57)
Board approval (Y/N)						-0.1768	0.1070
						(0.83)	(0.62)
Dividend tax						-0.2394	0.4811
disadvantage						(0.52)	(0.99)
Option compensation						-0.7258	-0.2662
						(1.53)	(-0.45)
Diffuse ownership						-0.0883	0.3489
						(0.15)	(0.68)
Lambda						0.2196***	0.2122***
						(3.47)	(3.25)
Analysts						-0.0423	-0.0822
						(0.90)	(-1.07)
Inst. ownership						1.5108	1.6833
						(0.94)	(1.12)
Missing country char. Indicators		Y	Y	Y	Y	Y	Y
Industry-year f.e.		Y	Y	Y	Y	Y	Y
Region-year f.e.			Y	Y		Y	Y
Nation-year f.e.				Y	Y		
N. obs.	5,673	5,668	5,668	5,615	9,202	5,668	9,255
R^2	0.013	0.046	0.061	0.118	0.085	0.072	0.064

Table XIII

Buyback Completion Rates – Cross-sectional Regressions

The table reports the estimates of a regression of firm-level buyback completion rates on *Firm-specific factors* and *Country-level factors*. Whenever a given country factor is missing, the corresponding observations are replaced by a 0, and a missing country factor indicator set equal to 1. Specification (1) also includes an intercept, omitted from the table for brevity. Columns (1)-(4) and (6) only include non-U.S. buybacks; (5) and (7) also include U.S. buybacks. The standard errors are clustered around nations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Firm-specific factors				
U-index	-1.8717**	-1.3938**	-1.7281***	-1.7435***	-0.6192	-1.7617***	-0.6176
	(2.48)	(-2.48)	(-2.98)	(-3.00)	(-0.72)	(-3.12)	(-0.72)
Leverage	-9.6792***	-6.7920***	-4.1988**	-4.1184**	-0.7236	-4.5472**	-0.0402
	(3.39)	(-2.99)	(-2.09)	(-2.19)	(-0.27)	(-2.30)	(-0.02)
Dividend payout	1.5258	-2.3387	5.2361	4.4832	7.2911**	4.6786	6.9057*
	(0.25)	(-0.60)	(1.59)	(1.24)	(2.30)	(1.36)	(1.81)
Percentage sought	-5.4078	4.5928	-20.5182*	-12.4047	-1.0e+02***	-18.7277*	-97.3990***
	(0.32)	(0.31)	(-1.92)	(-1.21)	(-3.76)	(-1.76)	(-3.54)
Subsequent buyback	-0.9539	-1.6926	-1.4739**	-1.0402	3.5755	-1.2900*	2.9804
	(0.55)	(-1.53)	(-2.52)	(-1.35)	(1.16)	(-1.98)	(0.99)
Change in beta	-0.0218	-0.0329	-0.0309	-0.0270	0.0056	-0.0325	0.0038
	(0.93)	(-1.27)	(-1.23)	(-0.97)	(1.41)	(-1.34)	(0.71)
Takeover target	-2.6549	0.9620	0.2915	-0.4033	8.6673**	0.1404	8.7357**
	(0.79)	(0.35)	(0.13)	(-0.18)	(2.59)	(0.06)	(2.72)
Buyback has follow-up	-3.5522	-0.3773	-0.1799	0.2770	6.2856	0.0551	6.0340
	(1.42)	(-0.23)	(-0.23)	(0.37)	(1.54)	(0.07)	(1.50)

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Table XIII Buyback Completion Rates – Cross-sectional Regressions – continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Country-level factors			
Anti-director index						-0.5859	-4.9797**
						(0.36)	(-2.59)
Leuz et al. index						0.3132	-0.4174
						(1.26)	(-1.31)
Board approval (Y/N)						-3.1530	-15.9809***
						(0.85)	(-3.16)
Dividend tax						22.1176***	-9.5767
disadvantage						(2.90)	(-0.80)
Option compensation						18.3191**	7.6275
						(2.37)	(0.69)
Diffuse ownership						-31.3931***	-18.2291
						(3.60)	(-1.40)
Lambda						1.8470**	2.2565
						(2.09)	(1.43)
Analysts						1.2220	0.1516
						(1.33)	(0.07)
Inst. ownership						-31.6983	69.7266***
						(1.38)	(3.68)
Missing country char. Indicators		Y	Y	Y	Y	Y	Y
Industry-year f.e.		Y	Y	Y	Y	Y	Y
Region-year f.e.			Y	Y		Y	Y
Nation-year f.e.				Y	Y		
N. obs.	5,673	5,668	5,668	5,615	9,202	5,668	9,255
R^2	0.009	0.200	0.253	0.287	0.315	0.258	0.273

Figure 1. Buyback Announcements, Global ex-U.S. and U.S., 1998-2010

The graph plots the number of buyback announcements, in the global ex-U.S. sample as well as in the U.S. sample, for each sample year. The sample consists of open-market buyback announcements, over the period 1998-2010, by non-U.S. firms, plus the U.S. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.

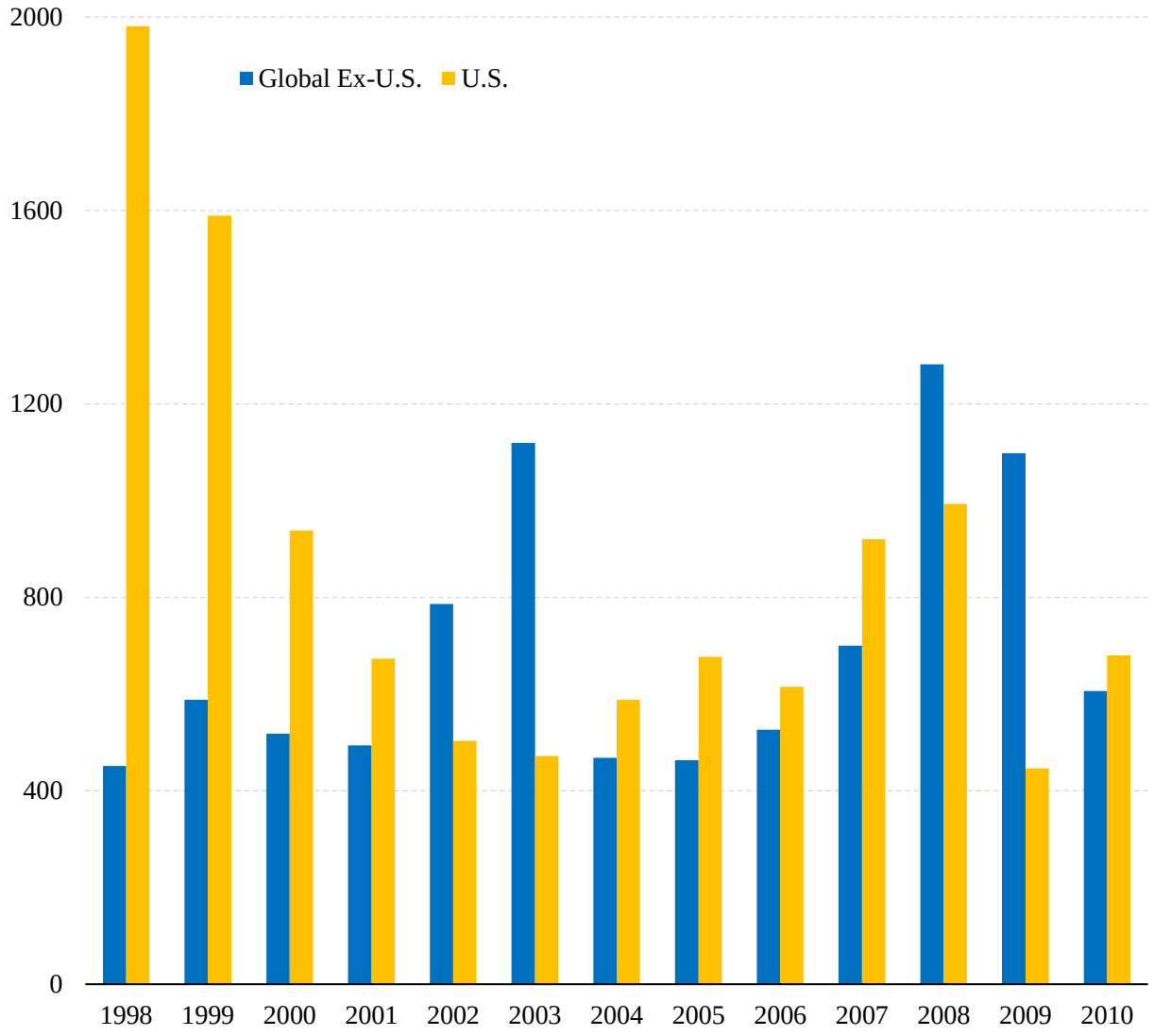
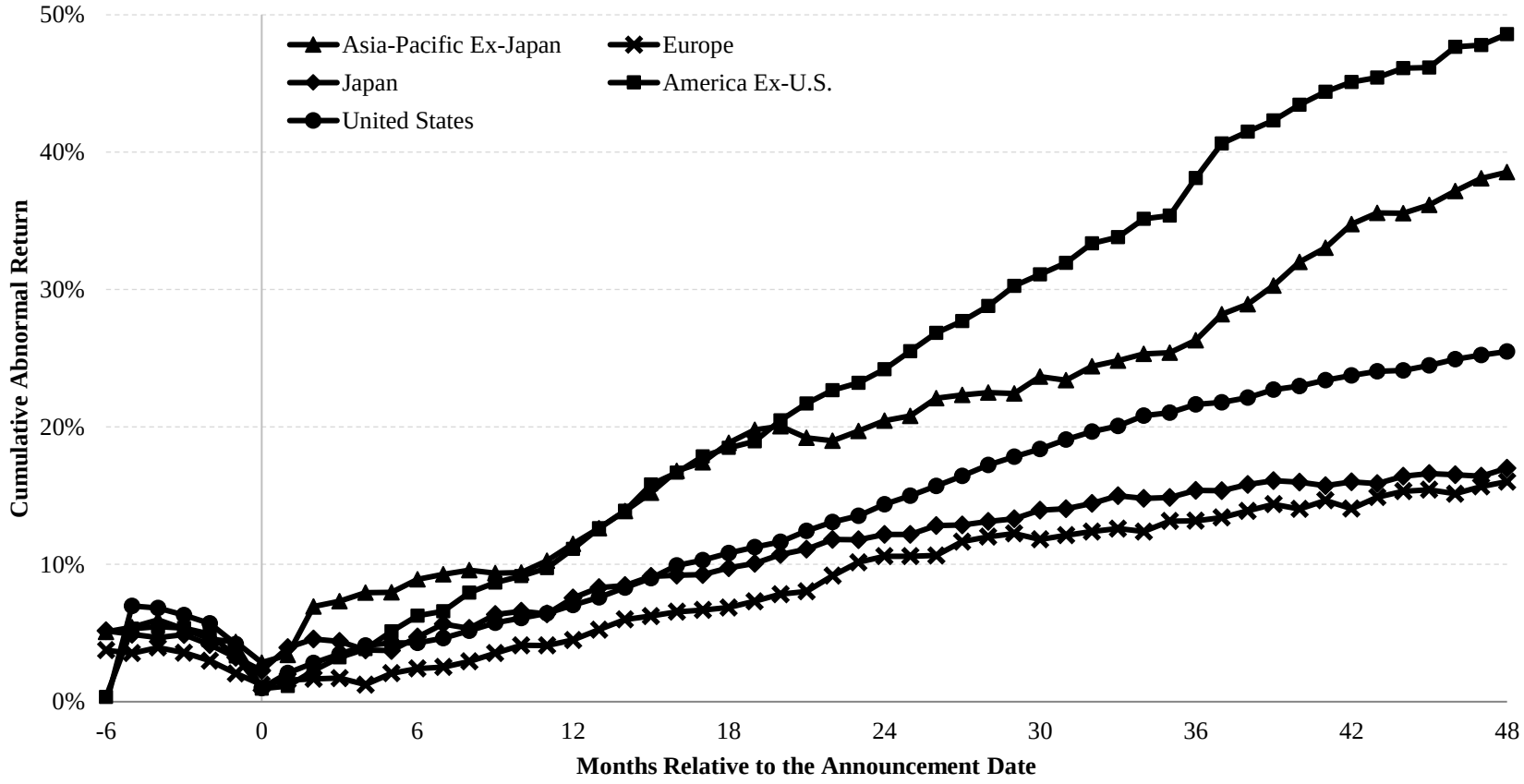


Figure 2. Long-Run Returns, by Region

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, plus U.S. buyback announcements over the same period. Buyback announcements are obtained from the SDC Mergers and Acquisitions and Repurchases datasets.



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