Are Buybacks Good for Long-Term Shareholder Value?

Evidence from Buybacks around the World

Internet Appendix

A. Variable definitions

I. Features of the buyback and the buyback firm

U-Index

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

Percentage sought

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

Takeover target

An indicator equal to one if the buyback firm receives a takeover offer in the 36 months following the buyback announcements. Details on how takeover targets are identified are described below, in Appendix F.

Subsequent buyback

An indicator equal to one if the buyback announcement follows a previous buyback announcement, by the same firm, within one and a half years.

Buyback has follow up

An indicator equal to one if the buyback announcement is followed by a subsequent buyback announcement, within four years following the initial announcement.

Risk-adjusted firm-level long-run return

This is the dependent variable in the regressions reported in Table XII of the paper. It is constructed as follows. For each buyback stock i, a regression $R_{it} - R_{ft} = \alpha + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \varepsilon_{it}$ is estimated, using the Fama-French regional factors and data over the entire 1998-2014 period. The risk-adjusted return on stock i on date t is then equal to $R_{it} - R_{ft} - \hat{\beta}_{i1}(R_{mt} - R_{ft}) - \hat{\beta}_{i2} SMB_t + \hat{\beta}_{i3} HML_t + \hat{\beta}_{i4} UMD_t$, where $\hat{\beta}_{ik}, k = 1, \dots, 4$ are the estimated loadings on the factor-mimicking portfolios. This is in a similar spirit as Brennan et al. (1998, section 4), with the difference that those authors estimate rolling regressions. The risk-adjusted firm-level long-run return is then the average risk-adjusted return over the 36 months following the buyback announcement month.

II. Country characteristics: Governance quality and investor protection

Anti-director index

An index of country-level quality of corporate governance, obtained from Djankov, La Porta, Lopez-de-Silanez, and Shleifer (2008). It is constructed as the sum of indicators for (a) whether proxy vote by mail is allowed, (b) whether the shares do not need to be deposited prior to the shareholders' meeting, (c) whether cumulative voting is allowed, (d) whether an oppressed minorities mechanism is in place, (e) whether shareholders have preemptive rights that can only be waived by a shareholders' meeting, and (f) whether the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10%. In a number of specifications, we also consider the components of the index individually.

Leuz, Nanda, and Wisocki (2003) Index

An index of the extent to which the firms of a given country engage in earnings management. A higher value of the index is associated with a greater incidence of earnings manipulation. The index values are obtained from Table 2, column 5, of Leuz et al.'s (2003) paper. Index values are not available for Brazil, China, Israel, Mexico, and New Zealand; a missing-value indicator variable is defined for these countries.

Board approval (Y/N)

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

III. Other country characteristics

Dividend tax disadvantage

A measure of the tax disadvantage of dividends vis-à-vis capital gains, from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000).

Option compensation

The percentage of executive compensation based on options in a given country. This variable is retrieved from the results of a survey conducted by compensation consultancy Towers Perrin, "Equity Incentives around the World" (2005).

Diffuse ownership

A measure of (inverse) ownership concentration from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008), equal to the average percentage of common shares that are not owned by the top three shareholders in the ten largest non-financial, non-state-owned domestic firms in a given country.

Lambda

A country-level measure of stock market illiquidity, akin to the parameter λ in Kyle's (1985) informed trading model. It is a proxy for lack of transparency and information available to investors in a given country. The variable is retrieved from Fong, Holden, and Trzcinka (2017).

Analysts

The number of analysts covering the average firm in a given country, retrieved from Degeorge, Ding, Jeanjean, and Stolowy (2013), as an alternative measure of transparency and information available to investors on the country level.

Institutional ownership

The country-level value-weighted average stock ownership by institutional investors. Institutional ownership data are retrieved from FactSet.

IV. Other control variables

Cumulative raw return over prior 6 months

The cumulative raw stock return over the six months preceding the repurchase announcement. This variable is used in the construction of the U-index.

Size

Firm size, equal to the natural logarithm of the firm's market value of equity (equal to stock price in U.S. dollars times the number of shares outstanding). This variable is used in the construction of the U-index.

Book-to-Market

Book-to-Market ratio. For non-U.S. firms, it is given by 1 divided by Datastream's MTBV variable. For U.S. firms, it is defined as the ratio of book value of total assets to market value. Total assets are given by Compustat data item AT. The market value is obtained as total assets minus book equity plus market value

of equity. The market value of equity is given by stock price (Compustat data item PRCC_C) times shares outstanding (data item CSHO). Book equity is defined as shareholders' equity (data item SEQ), or common equity (data item CEQ) plus preferred stock, or total assets minus total liabilities (data item LT) minus preferred stock plus deferred taxes and investment tax credit (data item TXDITC) minus postretirement benefit asset (data item PRBA). Preferred stock is evaluated at liquidation value (data item PSTKL), or redemption value (data item PSTKRV), or as total preferred stock (data item PSTK). This variable is used in the construction of the U-index.

Leverage

Leverage ratio. It is defined as the ratio of total debt to total assets. For non-U.S. firms, total debt is given by Worldscope data item WC03255 and total assets by data item WC02999. For U.S. firms, total debt is given by the sum of short and long term debt (Compustat data items DLC and DLTT), and total assets by data item AT.

Dividend payout ratio

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

Change in beta

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

B. Cleaning the stock return data from Datastream

A number of studies have pointed out that the quality of international stock return data from Datastream is lower than that of the CRSP data (Ince and Porter (2006), Karolyi, Lee, and van Dijk (2012)). This problem is especially serious in the case of the long-run return following the repurchase announcement. In order to clean up the monthly stock return data used in our sample, we implement three filters, following Ince and Porter (2006; please refer to this paper for a more detailed description of the filters). First, in order to avoid using stale prices due to delisting, for every stock we eliminate all zero returns starting from the most recent observation, until the last non-zero return. Second, we control for 'typos' in the input of the data. We do so by setting any return above 300% that is reversed within one month as missing. Third, as a last step for every month in the sample and every nation we censor stock returns below the 1st and above the 99th percentiles.

C. Sample selection details

The sources of open-market repurchase announcement data used in this paper are the Security Data Corporation's (SDC) Mergers and Acquisitions and Repurchases databases. As explained in the text, in order to perform the analysis the repurchase announcement data from the SDC databases are merged with two other sources: Datastream and Worldscope. All the results reported in the paper implicitly require that the relevant variables are available, thus only a subset of the entire open-market repurchase announcements from SDC are used in the analysis. The table illustrates the coverage.

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

D. Estimating buyback completion rates

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

Given the limited availability of data on Worldscope, we focus on the first method. For each buyback firm in our sample and each month $t = 1, \dots, 48$ subsequent to the announcement date, we obtain the number of shares outstanding N_t as the Datastream data item NOSH. We then consider monthly decreases in shares outstanding, i.e. $-\min\{N_t - N_{t-1}, 0\}$, as the actual shares bought back. As Stephens and Weisbach (1998), we do not offset monthly decreases with monthly increases, i.e. if the number of shares increased in a given month, we assume the actual buyback activity to be 0. For U.S. buyback

announcements, we replicate this procedure using monthly changes in the CRSP number of shares outstanding (CRSP data item SHROUT). To the extent that the firm both repurchases and distributes shares within a given month, this method provides a lower bound for the actual buyback activity. We scale the cumulative decrease in shares outstanding by the number of shares outstanding one month prior to the buyback announcement, obtaining the percentage of shares bought back. The completion rate in a given month is then the ratio between this percentage and the percentage of shares sought for repurchase. As Stephens and Weisbach (1998), whenever the completion rate exceeds 100%, we set it to 100% (this could happen, for instance, if there are overlaps with subsequent buyback announcements).

Table II in the paper presents summary statistics about completion rates for the sample countries. On average, the completion rate for buyback programs outside the U.S. 1 year after the announcement date is 28%, increasing to 40%, 52%, and 62%, 2, 3, and 4 years after the buyback announcement. In comparison, using the same method Stephens and Weisbach (1998) find an average completion rate for U.S. buybacks of about 74% at 3 years after the announcement date. Combining this estimate with the alternative methods available to them (but not to us), Stephens and Weisbach (1998) are able to "bound expected actual repurchases during the three years following the announcement of the program at between 74 percent and 82 percent," reasonably close to the estimates for our international sample. Similarly to Stephens and Weisbach (1998), we also find a bimodal distribution for actual buyback activity: while more than half of the sample firms that announce a repurchase complete the buyback program within one year of the announcement date, about 10% do not appear to repurchase any shares within four years.

E. Bootstrapping U.S. buyback returns

The individual country-level buyback samples in our data are generally smaller than buyback announcement samples used in the literature on U.S. buybacks. In order to assess the statistical significance of the announcement returns reported in Table II in such small samples, we resort to a bootstrap procedure that compares them to the distribution of announcement returns from samples of comparable size drawn from the universe of U.S. open-market buybacks.

For each nation in our sample having *n* announcements, we randomly select a sample of *n* U.S. open-market buybacks, and compute the average U.S. announcement returns. We repeat this procedure 1,000 times, each time drawing a fresh sample of U.S. announcements. We then compare the non-U.S. average CAR to the distribution of bootstrapped U.S. CAR. The sample of U.S. repurchase announcements used in the bootstrap procedure is the universe of U.S. buybacks used in this study. We also repeat the bootstrap procedure using a sample of U.S. open-market repurchase announcements from the period 1991-2001 (this is the same period covered by Peyer and Vermaelen (2009)). The results are similar to the ones reported, and are thus omitted for brevity.

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

We retrieve all takeover announcements for firms from our sample countries over the 1997-2013 period from the Security Data Corporation (SDC) Mergers and Acquisitions database. We restrict the attention to completed acquisitions, where following the acquisition the bidder owns at least 50% of the target's shares. We then match the identifying information for the target firms to the buyback firms in our sample, and we assign a given buyback firm to the "takeover target" group if the buyback firm was the target of an acquisition over the period from one month prior to the buyback announcement until three years (36 months) after the buyback announcement. We supplement this information with delisting information from Datastream, obtained by screening the "extended name" (ENAM) data item for all our sample firms, and consider as takeover targets also the firms reported as delisted within the three-year window (the results are qualitatively similar if this additional information is not included). Based on this approach, 12.6% of our sample firms (5.3% in non-U.S. countries and 19.2% in the U.S.) are classified as "takeover targets".

In the analysis reported in Table VIII (panels D and H), we augment the four-factor model for stock returns by the takeover factor introduced by Cremers et al. (2009). For U.S. buybacks, we simply use the takeover factor data of Cremers et al. For non-U.S. buybacks, we replicate the Cremers et al. (2009) takeover factor. The takeover factor is based on a portfolio long in stocks that are more likely to be takeover targets, and short in stocks that are less likely. In Cremers et al. (2009), the takeover likelihood is estimated

by running a logit model for the probability that a given stock is a takeover target, including explanatory variables size (log of market equity), Tobin's Q, leverage, log cash, PPE-to-assets ratio, ROA, industry activity (whether there were takeovers in a given industry in the previous year), industry indicators, an indicator for the presence of a blockholder, and the interaction between this indicator and the Gompers et al. (2003) governance index. We estimate the same model, however, due to data availability, replacing the blockholder indicator by the voting rights of the largest shareholder.

G. Clustering of buyback announcement months; pre-announcement returns

Section IV discusses the possibility that smaller announcement returns in shareholder approval countries simply reflect that an announcement that during the next shareholders meeting the management will ask permission to buy back stock is not very informative. Two further pieces of evidence are consistent with this interpretation. First, as illustrated in Figure IA.1 in this Internet Appendix, in shareholder approval countries there is a strong clustering of buyback announcements in April-May, when shareholders' assemblies are held. Second, as illustrated in Figure IA.2, pre-announcement returns suggest that the buyback announcement follows a period of negative stock price performance in board approval countries, but not in shareholder approval countries. In the United States, open-market buyback announcements are on average preceded by cumulative abnormal returns of -6% over the one-month period prior to the announcement. Outside the U.S., in board approval countries the pre-announcement one-month cumulative abnormal return is about -2%; in contrast, it is near zero, and actually slightly positive, in shareholder approval countries.

H. Differences in factor loadings before and after 2003

Table IX documents the long-run abnormal returns for buyback stocks in the period following 2003. In Table IA.II of this Internet Appendix, we report the differences in factor loadings for portfolios of buyback firms formed using the calendar-time approach of Table IX.B.

References (not already included in the paper)

Gompers, Paul, Joy L. Ishii, and Andrew Metrick, 2003, Corporate Governance and Equity Prices, *Quarterly Journal of Economics* 118, 107-155.

Kyle, Albert S., 1985, Continuous Auctions and Insider Trading, *Econometrica* 53, 1315-1335.

Table IA.I
Characteristics of Buyback Firms and Country-Level Measures

In panel A., the table reports summary statistics for the variables of interest as well as control variables used in the analysis, for non-U.S. as well as U.S. buybacks. In panel B., the table reports the values of the country governance and investor protection variables used in the analysis: the Anti-director index of Djankov et al. (2008), the Leuz et al. (2003) earnings management index, and the indicator variable for Board Approval (Y/N) of repurchase programs in the country. In panel C., the table reports the value of other country characteristics used in the analysis: Dividend tax disadvantage (La Porta et al. (2000)), incidence of Option compensation in the country, Diffusion of ownership (average percentage of ownership of the non-top 3 shareholders (Djankov et al. (2008)), Lambda, a measure of stock market illiquidity from Fong et al. (2017), Analysts, the number of analysts covering the average firm in a given country (Degeorge et al. (2013), and the institutional stock ownership (for this variable, the average value for each country is reported). All variables are defined in detail in Appendix A.

A. Summary Statistics

Variable	Mean	St. dev.	Min	Median	Max	N. Obs.
			Non-U.S. Buybacks			
U-index	5.833	1.365	3.000	6.000	9.000	6,840
Prior return	0.013	0.435	-0.915	-0.028	1.529	8,634
Size	5.120	2.084	-2.813	4.862	11.953	8,067
Book-to-market	1.107	0.923	0.068	0.833	5.000	6,840
Leverage	0.435	0.246	0.000	0.442	1.000	6,573
Dividend payout ratio	0.081	0.192	0.000	0.009	0.872	7,785
Percentage sought	0.076	0.043	0.000	0.068	0.500	8,185
			U.S. Buybacks			
U-index	5.666	1.470	3.000	6.000	9.000	9,696
Prior return	-0.039	0.346	-0.976	-0.042	0.811	10,461
Size	6.183	2.161	0.242	6.039	12.865	10,642
Book-to-market	0.670	0.515	0.053	0.543	3.056	9,860
Leverage	0.553	0.265	0.000	0.551	0.947	9,886
Dividend payout ratio	0.010	0.033	0.000	0.000	0.886	8,354
Percentage sought	0.092	0.080	0.000	0.064	0.499	6,020

Table IA.I Characteristics of Buyback Firms and Country-Level Measures – cont'd

Nation	Anti-director index	Leuz et al. (2003) index	Board approval (Y/N)
United States	3	2.0	1
Region: America Ex-U.S.			
Brazil	5		0
Canada	4	5.3	1
Mexico	3		0
Region: Asia-Pacific Ex-Japan			
Australia	4	4.8	1
China	1		0
Hong Kong	5	19.5	0
India	5	19.1	1
Indonesia	4	18.3	0
Malaysia	5	14.8	0
New Zealand	4		1
Philippines	4	8.8	0
Singapore	5	21.6	0
South Korea	5	26.8	0
Taiwan	3	22.5	1
Thailand	4	18.3	1
Region: Europe			
Austria	2.5	28.3	0
Belgium	3	19.5	0
Denmark	4	16.0	0
Finland	3.5	12.0	0
France	3.5	13.5	0
Germany	3.5	21.5	0
Greece	2	28.3	0
Israel	4		1
Italy	2	24.8	0
Netherlands	2.5	16.5	0
Norway	3.5	5.8	0
Spain	5	18.6	0
Sweden	3.5	6.8	0
Switzerland	3	22.0	1
United Kingdom	5	7.0	0
Region: Japan			
Japan	4.5	20.5	0

Table IA.I Characteristics of Buyback Firms and Country-Level Measures – cont'd

C. Other country characteristics

Nation	Div. tax disadvantage	Option compensation	Diffuse ownership	Lambda	Analysts	Inst. ownership
United States	0.58	85	0.20	0.008	5.5	0.670
Region: America Ex-U.S.						
Brazil		65	0.57	0.201		0.180
Canada	0.89	85	0.40	0.092	4.2	0.432
Mexico	1.00	30	0.64	0.085		0.210
Region: Asia-Pacific Ex-Japan						
Australia	0.90	50	0.28	0.064	4.6	0.116
China		35	0.45	0.029		0.064
Hong Kong	1.00	55	0.54	0.058		0.105
India	0.59	20	0.4	5.814	2.7	0.109
Indonesia	0.76		0.58	1.260		0.092
Malaysia	0.68		0.54	0.197	2.9	0.057
New Zealand	1.00		0.48	0.040		0.094
Philippines	1.05		0.57	0.399		0.093
Singapore	0.96	75	0.49	0.033	3.9	0.143
South Korea	0.85	20	0.23	0.001	4.6	0.155
Taiwan	0.60		0.18	0.003		0.118
Thailand	0.90		0.47	0.820		0.106
Region: Europe						
Austria	0.78		0.58	0.016	1.8	0.112
Belgium	0.74	85	0.54	0.019	4.0	0.118
Denmark	0.67		0.45	0.047	2.7	0.183
Finland	1.07		0.37	0.047	5.9	0.322
France	0.64	90	0.34	0.029	4.9	0.210
Germany	0.86	40	0.48	0.059	5.8	0.196
Greece			0.67	0.058		0.091
Israel			0.51	0.208		0.259
Italy	0.77	75	0.58	0.011	5.1	0.132
Netherlands	0.40	75	0.39	0.032	11.1	0.293
Norway	1.08		0.36	0.040	4.1	0.183
Spain	0.72	60	0.51	0.009	7.8	0.141
Sweden	1.03	30	0.28	0.058	3.7	0.270
Switzerland	0.56	70	0.41	0.028		0.285
United Kingdom	0.83	80	0.19	0.036	4.8	0.251
Region: Japan						
Japan	0.70	35	0.18	0.278	2.2	0.103

Table IA.II Pre- and post-2003 factor loadings comparison

This table reports the difference between pre- and post-2003 factor loadings for portfolios of buyback firms. The post-2003 estimates correspond to the calendar time estimates reported in panel B of Table IX of the paper, for the four-factor model. For each of the market, size, book-to-market, and momentum factors, we report the difference in the factor loadings $\Delta\beta$ before and after 2003, as well as the associated t-statistic.

	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					
$\Delta\beta_{\mathrm{MKT}}$	0.18**	(2.20)	0.07	(1.07)	0.07	(1.16)	0.02	(0.30)
$\Delta\beta_{\mathrm{SMB}}$	0.63***	(4.42)	0.63***	(5.84)	0.54***	(5.86)	0.51***	(5.55)
$\Delta\beta_{\mathrm{HML}}$	-0.62***	(-4.55)	-0.46***	(-4.50)	-0.43***	(-5.00)	-0.41***	(-4.38)
$\Delta\beta_{\mathrm{UMD}}$	-0.07	(-1.00)	-0.12**	(-2.49)	-0.11***	(-2.66)	-0.11***	(-3.53)
			U.S. buybacks					
$\Delta\beta_{\mathrm{MKT}}$	0.00	(0.01)	0.03	(0.49)	0.06	(1.24)	0.07	(1.37)
$\Delta\beta_{\mathrm{SMB}}$	-0.08	(-0.54)	-0.12	(-1.04)	-0.14	(-1.43)	-0.21**	(-2.32)
$\Delta\beta_{\mathrm{HML}}$	0.05	(0.33)	0.17	(1.47)	0.20**	(2.13)	0.19**	(2.13)
$\Delta\beta_{\mathrm{UMD}}$	-0.05	(-0.76)	-0.10**	(-2.03)	-0.06	(-1.50)	-0.05	(-1.34)

Figure IA.1 Announcement month distribution

The graph plots the distribution of buyback announcements by calendar month, across buybacks announced by firms from shareholder approval countries, board approval countries (excluding the U.S.), and the U.S. The sample consists of open-market buyback announcements, over the period 1998-2010, by non-U.S. firms, plus U.S. buyback announcements over the same period.

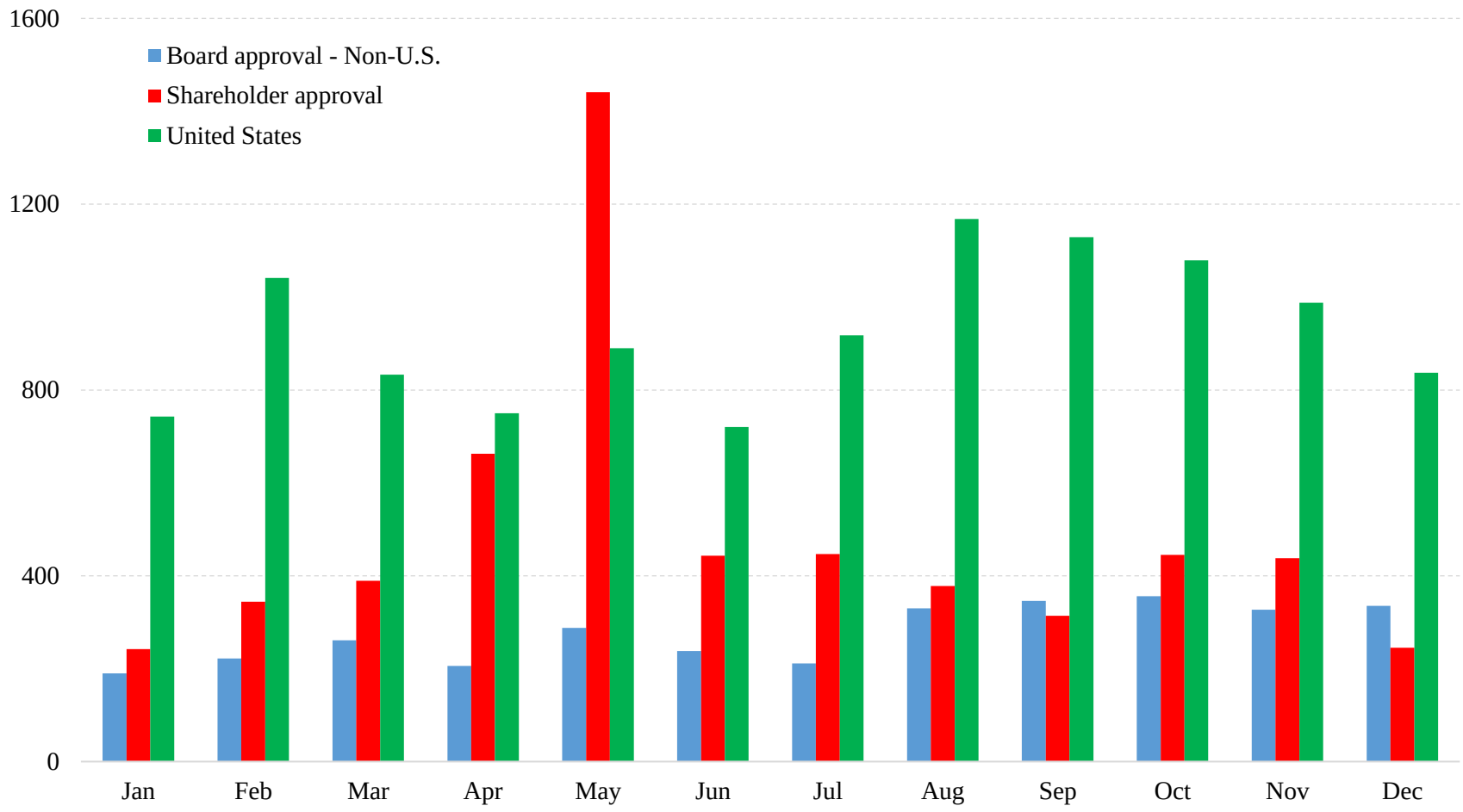
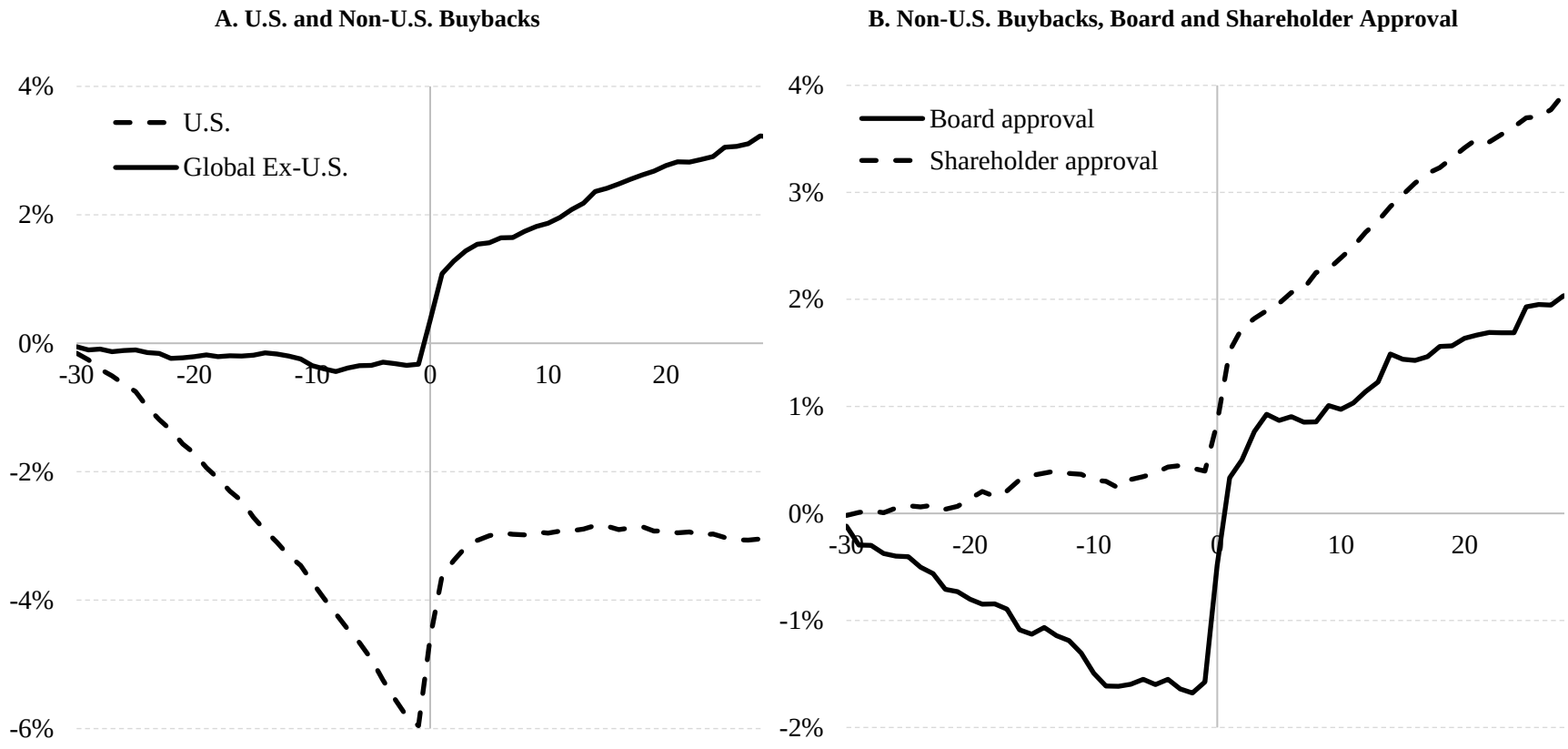


Figure IA.2. Announcement Returns

In panel A, the graph plots the cumulative average abnormal return around the buyback announcement date, for buybacks around the world excluding the U.S. (solid line), and separately for the U.S. buybacks (dashed line). In panel B, ex-U.S. buybacks are split between buybacks from board approval and shareholder approval countries. The vertical axis is rescaled in panel B to facilitate reading the graph. In both panels, on a given day and for a given buyback stock, the abnormal return is defined as the difference between the stock return and the return on the market index. The sample consists of open-market buyback announcements, over the period 1998-2010, by non-U.S. firms, plus the U.S.