Original Article

Market timing and issue type effects on the performance of Mexican American depository receipts listed on the New York stock exchange

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R. Stephen Elliott

is the Kilpatrick Life Insurance Company Endowed Professor of Insurance at Northwestern State University of Louisiana. His research interests include international investments and insurance. E-mail: elliott@nsula.edu

Mark Schaub

is the Capital One Bank Endowed Professor of Finance at Northwestern State University of Louisiana. His previous research, published in over 30 different journals, has been in the areas of consumer finance, international investments and stock market efficiency. E-mail: schaubm@nsula.edu

Correspondence: Mark Schaub, 312 Russell Hall, Northwestern State University, Natchitoches, Louisiana 71497, USA.

ABSTRACT This study examines Mexican American depository receipts (ADRs) listed on the New York Stock Exchange to determine their long-term investment performance relative to the S&P 500 Index. The sample is divided to capture effects of issue type (IPO versus SEO) and market timing (bull versus bear markets). Over a 36-month holding period, the data show that Mexican ADRs underperform the S&P 500 Index by nearly 21 per cent. Segmenting the sample, IPOs underperformed the market by nearly 27 per cent, whereas SEOs perform similar to the market. In addition, findings suggest that market timing affects ADR performance. The Mexican ADRs trading through the bull market underperformed by nearly 32 per cent, whereas those listed and trading through the bear market outperformed the S&P 500 by over 27 per cent.

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INTRODUCTION

Mexico is slightly less than three times the size of Texas and has a population of nearly 120 million people. With a trillion dollar free market economy, Mexico is dominated by private sector businesses. Investment is approximately

20.8 per cent of GDP and the inflation rate is typically around 4 per cent. Mexico has 12 free trade agreements with over 40 countries including Guatemala, Honduras, El Salvador, the European Free Trade Area and Japan. More than 90 per cent of trade is under free

trade agreements. Since 1994, with the implementation of the North American Free Trade Agreement (NAFTA), Mexican trade with the United States and Canada has tripled (see *The World Factbook*¹). Countries with free trade tend to increase sales, revenues and profits. The US investors purchasing Mexican equities listed on domestic stock exchanges as American depository receipts (ADRs) may be an excellent way to gain global diversification while earning returns that possibly exceed the US market.

Although Schaub² shows that Mexican ADRs tend to underperform the S&P 500, his analysis does not examine the diversification potential of Mexican ADRs. Essentially, maximum diversification benefits accrue to investors in securities that outperform the domestic index when that index is down. For this reason, our study examines the effects of market timing on Mexican ADR performance to isolate the diversification potential, comparing the ADR performance for ADRs issued during bull markets versus those listed and trading through bear markets. Also, the return differences based on equities issued as initial public offerings (IPOs) versus seasoned equity offerings (SEOs) are examined.

LITERATURE REVIEW

Earlier studies of ADRs indicate that performance tends to differ by country of origin, IPOs versus SEOs, developed or emerging markets, market timing and by type of firm. Callaghan, Kleiman and Sahu³ find that during the period of 1986–1993, 66 ADRs from 18 countries traded on the New York Stock Exchange (NYSE) earned 19.6 per cent cumulative excess returns (CXR) during the

first 12 months after the date of issue and note that emerging market ADRs outperform their counterparts from developed markets. Likewise, Surz⁴ concludes that ADRs outperform the S&P 500 Index by 16 per cent. According to Sundaram and Logue,⁵ ADRs generate significant positive excess returns (XRs) in short-term trading.

Counter to these results, Schaub⁶ finds emerging market and developed market ADRs underperform the S&P 500 Index by nearly 28 and 12 per cent, respectively, during a 36-month holding period. Furthermore, Elliott and Schaub⁷ find that the entire sample of financial institution ADRs perform similar to the market; however, those from developed countries significantly outperform the market index, whereas those from emerging markets perform similar to the market. Segmenting the sample by type of issue, the SEOs outperformed the IPOs. In a study of 333 ADRs from 35 countries, during the period of 1982–1996, Foerster and Karolyi⁸ conclude that ADRs underperform the market by nearly 15 per cent during a 36-month holding period from the date of issue.

Other studies by industry show differing ADR returns relative to the US market returns. In the short term, the food and beverage industry (Elliott and Schaub⁹) and the manufacturing firm ADRs (Elliott and Schaub¹⁰) perform similar to the S&P 500 Index. However, in the banking, financial services and insurance industry, ADRs outperform the market index by 4.32 per cent over a 36-month holding period (Elliott and Schaub¹¹).

Studies of ADR performance by country also show mixed results. In an earlier study of Mexican ADRs issued on the NYSE during the period 1 January 1991 to 31 May 1996, Schaub²

finds that the ADRs underperform the S&P 500 Index by nearly 200 per cent during the first 5 years from the date of issue. Furthermore, Chilean ADRs significantly underperform the S&P 500 by more than 32 per cent during the 36-month holding period after initially listed on the NYSE. Segmenting the ADRs by type of issue indicates that Chilean SEOs perform similar to the market index, whereas IPOs sharply underperform the market by 45 per cent (Elliott *et al*¹²). Studies by Ritter,¹³ Brav and Gompers,¹⁴ Levis,¹⁵ Huang¹⁶ and Aggarwal *et al*¹⁷ suggest that IPOs generally underperform the market in the United States, in foreign countries, the United Kingdom, Taiwan and Latin America, respectively. On the other hand, Dawson¹⁸ and Ben Naceur¹⁹ find that IPOs outperform the market during a long-term holding period.

To explain the differences in ADR performance, Schaub²⁰ and Schaub and Highfield^{21,22} find that market timing may be a key factor in ADR performance. In a study of Chinese equities, Schaub²³ concludes that during the first 3 years of trading on the NYSE, Chinese ADRs perform nearly the same as the S&P 500 Index. However, those trading during the bull market underperformed the market index by more than 26 per cent, whereas those trading through the bear market outperformed the S&P 500 Index by almost 40 per cent.

The advantage to investing in ADRs is to enhance global diversification (Officer and Hoffmeister²⁴). As little consensus on ADR performance exists, this study examines Mexican ADRs to assist those who embrace diversification and desire to invest in equities from our closest southern NAFTA trading partner.

THE PROBLEM

The problem of this study is twofold. First, the problem is to determine whether Mexican equities newly listed as ADRs on the NYSE generally outperform the S&P 500 Index over a 36-month period following the date of issue, and to determine whether the Mexican ADRs classified as IPOs or SEOs outperform the market. Second, the problem is to determine whether market timing influences the performance of Mexican ADRs.

METHODOLOGY

The ADR portfolio is comprised of all Mexican equities listed on the NYSE during the period January 1990–December 2002. This particular period is selected to capture a 3-year ADR performance during a relatively normal economic environment without the effects of the financial crisis of 2008. The study period represents a time of relative sustained economic growth, price stability, prosperity and a time that includes both a bull and bear market. The Mexican ADRs are identified through the NYSE web site that lists all non-US firm securities traded on the exchange. The portfolio includes a total of 27 Mexican ADRs and of these, 7 were SEOs and 20 were IPOs. The portfolio includes 22 ADRs listed before 1 January 1998 during the bull market and 5 ADRs listed after 1 January 1998 during the bear market.

Standard ADR event study methodology used for computing ADR returns, market returns, XRs and testing of the returns are found in Schaub.⁶ Because of being a broad and highly respected market measure, the S&P 500 Index represents the proxy for market performance.

Daily and monthly returns for each security were computed for the first 36 months after listing on the NYSE. Then the coinciding returns of the S&P 500 were subtracted to produce XRs. These XRs were cumulated on a monthly basis and tested for significance.

Equations 1 through 3 describe method through which XR and CXR were computed for statistical testing. In equation 1, the XR for each security i for month t (xr_{it}) is computed as the difference between the return of the security during month t (r_{it}) and the return of the market for month t (r_{mt}).

$$xr_{it} = r_{it} - r_{mt} \quad (1)$$

Equation 2 shows that the average XR for the sample on day/month t (XR_t) is computed as the mean of the sum of XRs of each of the ADRs for month t .

$$XR_t = \frac{1}{n} \sum_{i=1}^n xr_{it} \quad (2)$$

CXRs as of month s are the summation of average XRs starting at month 1 until month s , where s ends on month 36 as shown in equation 3.

$$CXR_{1,s} = \sum_{t=1}^s XR_t \quad (3)$$

The average XRs and CXRs were tested to determine significance using a Z-score. Reported P -values determine significance at the 0.10 alpha level. Significant P -values are noted in bold print.

FINDINGS

During the 36-month holding period, CXRs for the entire sample of 27 Mexican ADRs are not significantly different from the market

returns. Table 1 shows significant and negative CXRs in months 12, 13–27 and 33, underperforming the S&P 500 Index by a range of -12.99 per cent in month 12 to -31.77 per cent in month 23. However, on the 36th month, the ADRs end the holding period with performance that is similar to the S&P 500 Index. Findings differ from the earlier studies by Schaub² and Elliott *et al.*,¹² which reveals a sharp underperformance of Mexican ADRs and Chilean ADRs respectively, relative to the S&P 500 Index.

Segmenting the ADRs into SEOs and IPOs in Table 1, the data reveal that SEOs finish the period with performance similar to the market. A significant negative XR of -6.59 per cent appears in month 1, after which CXRs are not significant. On the other hand, the IPOs earn significant positive returns of 7.58 and 7.33 per cent in months 2, and 3, respectively, and significant negative returns in months 13 through 27 and 33 through 36. Significant negative CXRs range from -20.28 per cent in month 13 to -41.80 per cent in month 23. At the end of the 36-month period, the IPOs underperform the S&P 500 Index by -26.88 per cent. These findings suggest Mexican SEOs outperform IPOs relative to the market index and are consistent with Chilean SEO and IPOs (Elliott *et al.*¹²).

In the centre column of Table 2, returns are presented for Mexican ADRs listed and trading through the bull market (that is, listed before 1 January 1998). Data show that the Mexican ADRs underperform the S&P 500 in the bull market. This is consistent with findings by Schaub and Highfield²² and Schaub.²³ CXRs end the 36-month period with a significant -31.67 per cent return. In all, 20 of the 36 months have significant negative cumulative returns that

Table 1: Long-term performance for Mexican IPO and SEO ADRs listed on the NYSE (January 1990–December 2002)^a

Month	Entire sample (27 observations)				SEO ADRs (7 observations)				IPO ADRs (20 observations)			
	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value
+1	0.44	0.43	0.44	0.43	−6.59	0.08	−6.59	0.08	2.90	0.15	2.90	0.15
+2	3.58	0.10	4.02	0.14	0.41	0.46	−6.17	0.17	4.69	0.09	7.58	0.04
+3	−1.29	0.33	2.72	0.28	−4.26	0.25	−10.44	0.12	−0.25	0.47	7.33	0.09
+4	−2.09	0.19	0.64	0.45	−2.00	0.36	−12.44	0.12	−2.12	0.21	5.21	0.20
+5	5.62	0.06	6.26	0.17	15.07	0.10	2.63	0.44	2.32	0.18	7.53	0.13
+6	−4.37	0.07	1.88	0.40	−0.59	0.45	2.04	0.45	−5.70	0.06	1.83	0.41
+7	−5.92	0.03	−4.03	0.30	−7.92	0.01	−5.87	0.37	−5.21	0.10	−3.39	0.35
+8	−3.32	0.10	−7.35	0.19	−7.56	0.04	−13.44	0.23	−1.84	0.28	−5.23	0.29
+9	−0.39	0.45	−7.75	0.19	1.39	0.38	−12.05	0.26	−1.01	0.39	−6.24	0.26
+10	−3.42	0.14	−12.17	0.12	0.61	0.47	−12.44	0.28	−4.83	0.07	−12.07	0.14
+12	−1.82	0.29	−12.99	0.09	1.07	0.42	−10.37	0.31	−2.84	0.24	−13.91	0.12
+12	0.61	0.42	−12.38	0.12	−0.04	0.50	−10.41	0.31	0.84	0.42	−13.07	0.13
+13	−6.89	0.03	−19.26	0.04	−5.96	0.09	−16.37	0.22	−7.21	0.06	−20.28	0.06
+14	−1.56	0.27	−20.82	0.03	2.49	0.27	−13.88	0.26	−2.98	0.17	−23.25	0.04
+15	−3.79	0.12	−24.61	0.02	2.04	0.23	−12.83	0.30	−5.83	0.08	−29.08	0.02
+16	−3.82	0.14	−28.43	0.01	−0.02	0.50	−12.85	0.30	−5.15	0.12	−34.23	0.01
+17	−2.22	0.22	−30.65	0.01	0.78	0.45	−12.06	0.32	−3.27	0.16	−37.50	0.01
+18	0.93	0.36	−29.72	0.01	2.07	0.26	−9.00	0.35	0.53	0.44	−36.97	0.01
+19	−0.41	0.45	−30.13	0.01	−1.45	0.30	−10.45	0.33	−0.05	0.50	−37.02	0.01
+20	2.95	0.21	−27.19	0.02	4.99	0.05	−5.46	0.41	2.23	0.32	−34.79	0.02
+21	−3.21	0.06	−30.40	0.01	1.23	0.38	−4.22	0.43	−4.77	0.03	−39.56	0.01
+22	3.92	0.13	−26.48	0.03	−0.81	0.43	−5.03	0.42	5.57	0.10	−33.98	0.02
+23	−5.29	0.01	−31.77	0.01	1.93	0.35	−3.10	0.45	−7.82	0.00	−41.80	0.01
+24	2.70	0.16	−29.07	0.02	−1.05	0.39	−4.16	0.43	4.01	0.12	−37.79	0.02
+25	1.39	0.20	−27.68	0.03	2.60	0.17	−1.55	0.48	0.97	0.32	−36.82	0.02
+26	2.96	0.04	−24.71	0.05	4.23	0.03	2.68	0.46	2.52	0.13	−34.30	0.03
+27	4.95	0.03	−19.77	0.10	4.23	0.24	6.91	0.40	5.20	0.04	−29.10	0.06
+28	4.17	0.12	−15.60	0.16	0.18	0.48	7.09	0.39	5.56	0.12	−23.54	0.12
+29	1.07	0.30	−14.53	0.18	2.49	0.20	9.57	0.36	0.58	0.41	−22.97	0.12
+30	0.59	0.41	−13.94	0.19	−2.23	0.30	7.35	0.39	1.58	0.31	−21.39	0.14
+31	1.07	0.27	−12.87	0.21	−1.49	0.34	5.86	0.41	1.96	0.16	−19.43	0.16
+32	−1.32	0.23	−14.20	0.19	−2.37	0.23	3.49	0.45	−0.95	0.33	−20.38	0.15

Table 1 *continued*

Month	Entire sample (27 observations)				SEO ADRs (7 observations)				IPO ADRs (20 observations)			
	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value
+33	-6.72	0.01	-20.92	0.10	-7.88	0.04	-4.39	0.44	-6.32	0.05	-26.70	0.09
+34	1.46	0.30	-19.45	0.12	3.62	0.29	-0.77	0.49	0.71	0.41	-26.00	0.10
+35	1.09	0.34	-18.36	0.14	5.97	0.10	5.20	0.43	-0.61	0.42	-26.61	0.10
+36	-2.42	0.23	-20.78	0.12	-8.57	0.07	-3.37	0.45	-0.27	0.47	-26.88	0.10

^aThe computation of average excess returns (XRs) is described in equation 2 in the text and the computation of cumulative excess returns (CXRs) is described in equation 3 in the text. *P*-values in bold italics represent returns that are significant at the 10% alpha level.

Table 2: Market timing performance by month for Mexican ADRs listed on the NYSE (January 1990 – December 2002)^a

Month	Entire sample (27 observations)				Before 1 January 1998 sample (22 observations)				After 1 January 1998 sample (5 observations)			
	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value	XR (%)	P-value	CXR (%)	P-value
+1	0.44	0.43	0.44	0.43	2.13	0.23	2.13	0.23	-7.01	0.01	-7.01	0.01
+2	3.58	0.10	4.02	0.14	3.54	0.14	5.67	0.10	3.73	0.12	-3.28	0.27
+3	-1.29	0.33	2.72	0.28	-1.83	0.30	3.84	0.24	1.07	0.44	-2.20	0.39
+4	-2.09	0.19	0.64	0.45	-0.84	0.37	3.01	0.31	-7.59	0.13	-9.79	0.18
+5	5.62	0.06	6.26	0.17	5.65	0.09	8.66	0.12	5.50	0.24	-4.29	0.37
+6	-4.37	0.07	1.88	0.40	-6.70	0.02	1.96	0.41	5.86	0.15	1.57	0.46
+7	-5.92	0.03	-4.03	0.30	-4.19	0.12	-2.23	0.40	-13.52	0.00	-12.95	0.22
+8	-3.32	0.10	-7.35	0.19	-3.84	0.12	-6.07	0.26	-1.05	0.36	-13.00	0.21
+9	-0.39	0.45	-7.75	0.19	-0.70	0.42	-6.77	0.25	0.95	0.27	-12.05	0.22
+10	-3.42	0.14	-12.17	0.12	-6.33	0.03	-13.10	0.12	9.39	0.03	-2.66	0.44
+12	-1.82	0.29	-12.99	0.09	-1.89	0.31	-14.99	0.09	-1.52	0.35	-4.18	0.41
+12	0.61	0.42	-12.38	0.12	2.21	0.25	-12.78	0.14	-6.43	0.23	-10.60	0.29
+13	-6.89	0.03	-19.26	0.04	-8.23	0.02	-21.01	0.05	-0.96	0.46	-12.57	0.29
+14	-1.56	0.27	-20.82	0.03	-2.05	0.25	-23.07	0.04	0.62	0.42	-10.95	0.30
+15	-3.79	0.12	-24.61	0.02	-4.95	0.09	-28.02	0.02	1.32	0.37	-9.63	0.33

Table 2 *continued*

<i>Month</i>	<i>Entire sample (27 observations)</i>				<i>Before 1 January 1998 sample (22 observations)</i>				<i>After 1 January 1998 sample (5 observations)</i>			
	<i>XR</i> (%)	<i>P-value</i>	<i>CXR</i> (%)	<i>P-value</i>	<i>XR</i> (%)	<i>P-value</i>	<i>CXR</i> (%)	<i>P-value</i>	<i>XR</i> (%)	<i>P-value</i>	<i>CXR</i> (%)	<i>P-value</i>
+16	−3.82	0.14	−28.43	0.01	−5.10	0.10	−33.12	0.01	1.82	0.41	−7.81	0.36
+17	−2.22	0.22	−30.65	0.01	−2.48	0.23	−35.60	0.01	−1.07	0.42	−8.88	0.35
+18	0.93	0.36	−29.72	0.01	−0.31	0.46	−35.90	0.01	6.36	0.01	−2.51	0.46
+19	−0.41	0.45	−30.13	0.01	−1.78	0.32	−37.68	0.01	5.60	0.10	3.08	0.45
+20	2.95	0.21	−27.19	0.02	3.24	0.23	−34.44	0.02	1.65	0.24	4.73	0.42
+21	−3.21	0.06	−30.40	0.01	−4.52	0.02	−38.96	0.01	2.54	0.33	7.27	0.38
+22	3.92	0.13	−26.48	0.03	4.67	0.13	−34.28	0.02	0.61	0.45	7.88	0.38
+23	−5.29	0.01	−31.77	0.01	−5.19	0.03	−39.47	0.01	−5.76	0.08	2.12	0.47
+24	2.70	0.16	−29.07	0.02	4.38	0.08	−35.09	0.02	−4.69	0.15	−2.57	0.46
+25	1.39	0.20	−27.68	0.03	1.44	0.22	−33.66	0.03	1.20	0.39	−1.37	0.48
+26	2.96	0.04	−24.71	0.05	3.54	0.04	−30.12	0.04	0.40	0.45	−0.97	0.49
+27	4.95	0.03	−19.77	0.10	4.16	0.10	−25.95	0.07	8.41	0.00	7.44	0.39
+28	4.17	0.12	−15.60	0.16	6.31	0.07	−19.64	0.14	−5.26	0.02	2.18	0.47
+29	1.07	0.30	−14.53	0.18	0.21	0.46	−19.43	0.15	4.85	0.10	7.03	0.40
+30	0.59	0.41	−13.94	0.19	−0.29	0.46	−19.72	0.14	4.48	0.15	12.51	0.34
+31	1.07	0.27	−12.87	0.21	0.12	0.48	−19.61	0.15	5.24	0.07	16.75	0.27
+32	−1.32	0.23	−14.20	0.19	−1.27	0.28	−20.88	0.13	−1.55	0.29	15.20	0.29
+33	−6.72	0.01	−20.92	0.10	−8.40	0.01	−29.27	0.06	0.64	0.41	15.84	0.28
+34	1.46	0.30	−19.45	0.12	0.13	0.48	−29.14	0.07	7.33	0.08	23.17	0.21
+35	1.09	0.34	−18.36	0.14	0.40	0.45	−28.74	0.07	4.13	0.21	27.30	0.17
+36	−2.42	0.23	−20.78	0.12	−2.93	0.23	−31.67	0.06	−0.17	0.47	27.13	0.17

^aThe computation of average excess returns (XRs) is described in equation 2 in the text and the computation of cumulative excess returns (CXRs) is described in equation 3 in the text. *P*-values in bold italics represent returns that are significant at the 10% alpha level.

ranged from −14.99 to −38.96 per cent while 1 month has a significant cumulative positive return of 5.67 per cent.

In contrast, the right-hand column of Table 2 shows Mexican ADR returns during the bear market, which includes equities listed after 1 January 1998. The first month, the ADRs

underperformed significantly by 7 per cent. By the end of the 36-month trading window, Mexican ADRs outperformed the S&P 500 Index by 27.13 per cent during the bear market (although not significant at the 0.10 alpha level). Results of the bull market sample versus the bear market sample indicate a market-timing effect.

The bull market sample underperformed by nearly 32 per cent, whereas the bear market sample outperformed the market index by 27 per cent resulting in a 59 per cent performance difference in the two samples relative to the S&P 500.

CONCLUSION

Although Mexican ADRs returns generally appear to underperform the S&P 500, there is a difference among SEOs and IPOs. Investors may enhance earnings by purchasing SEOs that perform similar to the US market rather than buying IPOs that underperform the market. Significant negative returns for the ADR portfolio tend to be caused by the highly negative performance of the IPOs. Furthermore, data show that market timing is a key factor in Mexican ADR performance. While the US market is in a bull market, Mexican ADRs significantly underperform the S&P 500 and outperform the market during the US bear market. This indicates a diversification benefit to including Mexican ADRs in an investment portfolio. In a few more years, the opportunity for further study exists to examine the long-term performance of Mexican ADRs during the bear market caused by the financial crisis of 2008.

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