CAN INSTITUTIONAL INVESTOR SENTIMENTS EXPLAIN ADR MISPRICING?

Priti Verma[1]
Texas A&M University, USA
E-mail: priti.verma@tamuk.edu

ABSTRACT

This paper examines the role of U.S. institutional investor sentiments on ADRs from Mexico, Brazil, Chile and Columbia. We break-up the institutional sentiments into irrational components and further examine to what extent theADR premiums/ or discounts can be attributed to the irrational exuberances of U.S. institutional sentiments. We find that the irrationality of U.S. institutions are a significant determinant of ADR mispricing in Latin America. In most of these cases, the responses are immediately positive and insignificant thereafter. We argue that irrational bullish sentiments of the U.S. financial institutions might generate immediate gains but subsequently such errors could lead to a larger negative returns and cause greater volatility in the financial market.

JEL: G1, G14, G15
Key Words: American Depositary Receipts (ADR), Institutional Investor sentiments

I. INTRODUCTION

The deviations of an asset price from its fundamental value (often referred as mispricing), has attracted a considerable attention from finance practitioners and academicians. The extent of such mispricing and its sources plays a crucial role in devising arbitrage strategies. It is suggested that investors' sentiment is a major determinant of an asset's premium and discount over its intrinsic value. Specifically, recent behavioral asset pricing models have well documented the role of investor sentiments as a determinant of mispricing in the case of the U.S.

[1] Priti Verma, Ph.D. is an Associate Professor at the College of Business at Texas A&M University, Kingsville 700 University Blvd., MSC 186, Kingsville, TX 78363, USA, Tel: 361 593 2355, Fax: 361 593 3912.

stocks (Brown and Cliff, 2004a and 2004b; Solt and Statman, 1988; Clarke and Statman, 1998; Otto, 1999; Fisher and Statman, 2000, Brown and Cliff, 2004) and closed-end-funds (Bodurtha et. al., 1995; Zweig, 1973; Lee et. al., 1991; Simpson and Ramchander, 2002).

The current paper examines the relevance of the U.S. institutional investor sentiments in explaining mispricing in the American Depository Receipts (ADR) market. ADRs are U.S. dollar-denominated negotiable receipts that represent shares of foreign firms. This arrangement allows foreign firms to be listed and traded in U.S. stock markets without the inconvenience of currency conversions and foreign settlement procedures. ADRs are very popular in the U.S., as they are an alternate way of achieving international diversification. While ADRs are traded in the U.S., the underlying firm shares are traded in the firms' home countries. Most information relevant to the valuation of these firms is created at home and is factored in prices during the trading of the underlying shares in their home country stock markets. Following the law of one price, and in the absence of the U.S. market effect, ADR prices should simply be a U.S. dollar translation of the prices of underlying shares in the home countries. However, there exist significant deviations between the price of ADRs and the price of its underlying shares (see Maldonado and Saunders, 1983; Kato, Linn and Schallheim, 1991; Wahab and Lashgari, 1992; Park and Tavakkol, 1994; Suh, 2003).

Since, ADRs are traded in the U.S.; it is probably incorrect that ADR valuations are totally independent of the U.S. market movements. Moreover, if institutional investors' sentiments are also present in the U.S. market, we might expect ADR price movements to also be influenced by such sentiments.

In this paper, we analyze the role of institutional investor sentiments on ADRs from Mexico, Brazil, Chile and Columbia. We further break-up the institutional sentiments into rational and irrational components and further examine to what extent the premiums or, discounts associated with emerging market ADRs can be attributed to the irrational exuberances of U.S. institutional sentiments. It is important to analyze this effect on ADRs as institutional investors account for more than 50% of the trading in the U.S. (Cai and Zheng, 2004).

The results of the impulse response functions generated from the VAR model suggest the following: first, there are significant and immediate positive impact of expecations of U.S. institutional sentiments on ADR returns for Mexico and Brazil. However, in case of Chile, we find that these immediate postive relationship are followed by negative impact of sentiments on ADR returns. Unlike the response of other Latin American countries, the ADR returns for Columbia respond negatively to these expectations of the U.S. institutional investors. Second, we find that the irrationality of U.S. institutional sentiments

are significant determinant of mispricing in ADRs from Mexico, Chile and Columbia. In all these cases, the responses are immediately positive and insignificant thereafter. We did not find any significant results in case of Mexico.

These irrational components of U.S. institutional sentiments might generate immediate gains but subsequently such errors could lead to a larger negative returns and perhaps cause greater volatility in the financial market. These results also have important implications for individual investors who make their investment decisions solely based on the popular news media. They tend to thereby display herding mentality and intense tendencies to follow institutional investor behavior.

The remainder of the paper is organized as follows: Section 2 reviews the literature on ADR mispricing and the role of investors' irrationality on stock mispricing while section 3 describes. In section 4, we discuss the econometric methodology followed by empirical results in section 5. Section 6 concludes.

II. LITERATURE REVIEW

A. Mispricing of ADRs

Maldonado and Saunders (1983), Kato, Linn and Schallheim (1991) and Park and Tavakkol (1994) examine ADR mispricing and conclude that ADRs are not mispriced. Their studies suggest that there are no significant differences between the prices of ADRs and their corresponding underlying stocks.

Using a portfolio approach and controlling for risk differentials between ADRs and their corresponding underlying stocks, Wahab and Lashgari (1992) find that ADRs are mispriced. They conclude that there exists arbitrage opportunities exist between the ADRs and their corresponding underlying stocks.

Suh (2003) examines the co-movement of ADRs with the U.S. market. Using a sample of ADRs from emerging markets that impose foreign ownership restrictions and other capital barriers, he finds that ADR premiums and discounts co-move with the aggregate U.S. market returns. Overall, the above studies suggest that ADRs are mispriced.

B. Investors' irrationality and stock pricing errors

Several empirical studies have examined the role of investors' irrationality on stock misvaluation. These studies use either indirect measures or direct measures of investors' irrationality.

Studies using indirect measures include the following proxies: close-ended fund's discount (Gemmill and Thomas, 2002; Baker & Wurgler, 2003; Sias, Starks and Tinic, 2001; Neal and Whitney, 1998; Swaminathan, 1996; Elton, Gruber and Busse, 1998; Chan, Kan and Miller, 1993; Lee, Shleifer and Thaler,

1991); market performance based measures (Brown and Cliff, 2004); trading activity based measures (Brown and Cliff, 2004; Neal and Whitney, 1998); derivative variables (Brown and Cliff, 2004); dividend premium (Baker and Wurgler, 2003); and IPOs related measures (Baker & Wurgler, 2003; Brown and Cliff, 2004). Overall these studies do not provide a consensus on whether the proxies chosen are appropriate measures of investor sentiment and also show mixed results in their debate on the linkages between excess optimism and pessimism and stock returns.

Studies using direct measures employ surveys data that indicate the expectations of market participants. Research related to investors irrationality find strong co-movements with stock market returns (Brown and Cliff, 2004; De Bondt, 1993) and mixed results regarding its role in short term predictability of stock prices (Brown and Cliff, 2004; Fisher and Statman, 2000). Overall, these studies provide powerful and consistent empirical support for the hypothesis that stock prices are affected by investors' irrationality.

Bodurtha et. al. (1995) examine the premiums and discounts of closed-ends funds. They find a relationship between the premiums and discounts of closed-end funds and investor sentiments. Further, in another study Zweig (1973) concludes that the differential sentiments between the funds and its underlying assets are a primary cause of closed-end fund mispricing.

Lee et. al. (1991) conclude that the mispricing of closed-end funds are due to the differences in expectations of large and small investors who invest in the underlying assets and the closed-end funds respectively. Simpson and Ramchander (2002) use consumer sentiments as a proxy for investor sentiments and conclude that it explains closed-end funds mispricing. Overall, these studies suggest and support the proposition that investor sentiments can explain the mispricing of closed-end funds.

Prior studies document the effect of individual investor sentiments on stock price deviations from fundamental values and also explain closed-end fund mispricing. The purpose of this paper is to determine if institutional investor sentiments are able to explain ADR mispricing and explain the price deviation between the ADRs and the corresponding underlying stocks. To date, these effects have not been considered in the ADR literature.

III. DATA DESCRIPTION

To investigate the impact of the U.S. institutional investors' sentiments on ADR mispricing, we consider ADRs from four emerging stock markets of Latin America (Mexico, Brazil, Chile and Columbia).

The Latin American stock markets are included in this study because they have exhibited phenomenal growth in the past two decades. Brazil, Mexico, and

Chile are placed among the top 30 developed and emerging markets in the world and are ranked 18th, 25th, and 30th respectively (IFC, 1999). Further, Eun and Resnick (2007) suggests that the liquidity in these markets has been improving significantly.

The data used in this study are the monthly closing equity prices of the ADR country indexes provided by the Bank of New York.[2] The Bank of New York indexes track all ADRs that trade on the NYSE, AMEX and Nasdaq and are calculated on a continuous basis throughout the trading day. All indexes are value-weighted and are adjusted for free-float using the same method used in calculating the Dow Jones indexes. The underlying stocks are the closing equity prices of the respective country stock markets indexes. The following indexes are used in our study: IPC BOLSA (Mexico), BOVESPA (Brazil), General IGPA (Chile), and CSE (Columbia).

All data related to ADRs and underlying stocks are obtained from the *DataStream* and covers the period from January 1998 to June 2005. Percentage returns are calculated as 100 (log P_t – log P_{t-1}), where P_t is the value of the index at time *t*. ADR premiums and discounts are computed as the difference between the returns of the ADR index and the returns of corresponding underlying stock market index divided by the returns of corresponding underlying stock market index.

In order to compute an objective measure of the U.S. institutional investors' irrationality, we choose sentiment index based on Brown and Cliff (2004, 2005), Lee and Jiang (2002), Clarke and Statman (1998) and Solt and Statman (1988) which use the survey data of *Investors Intelligence (II)*, an investment service based in Larchmont, New York. *II* compiles and publishes data based on a survey of investment advisory newsletters. To overcome the potential bias problem towards buy recommendation, letters from brokerage houses are excluded. Based on the future market movements the letters are labeled as bullish, bearish or correction (hold). The sentiment index for the institutional investor is found by calculating the spread between the percentage of bullish investors and percentage of bearish investors. Because authors of these newsletters are market professionals, the *II* series is interpreted as a proxy for institutional investor sentiments.

We include the following variables as fundamentals that have been shown to carry non-redundant information in the asset pricing literature: (i) Economic growth (Fama, 1970; Schwert, 1990) measured as the monthly changes in the industrial production index (ii) Short term interest rates (Campbell, 1991) measured as the yield on one month U.S. Treasury Bill (iii) Economic risk premia (Ferson and Harvey, 1991; Campbell, 1987) measured as the term

[2] See http://www.adrbny.com/adr_index_landing.jsp

structure of interest rates (difference in monthly yields on three month and one month Treasury bills (iv) Future economic expectations variables (Fama, 1990) measured as the term spread (yields spread on the 10 year U.S. Treasury bond and three month Treasury bill) (v) Business conditions (Fama and French, 1989; Keim and Stambaugh, 1986) measured as the default spread (difference in yields on Baa and Aaa corporate bonds)(vi) Dividend yield (Hodrick, 1992; Fama and French, 1988; Campbell and Shiller, 1988a, 1988b) measured as the dividend yield for the value weighted Center for Research in Security Prices (CRSP) index over the past 12 months (vii) Inflation (Sharpe, 2002; Fama and Schwert, 1977) measured as the monthly changes in the consumer price index (viii) Excess returns on market portfolio (Lintner, 1965; Sharpe, 1964) measured as the value-weighted returns on all NYSE, AMEX, and NASDAQ stocks minus the one-month Treasury bill rate (ix) Premium on portfolio of small stocks relative to large stocks (SMB) (Fama and French, 1993). SMB (Small minus Big) is the average return on three small portfolios minus the average return on three big portfolios (x) Premium on portfolio of high book/market stocks relative to low book/market stocks (HML) (Fama and French, 1993). This Fama/French benchmark factor is constructed from six size/book-to-market benchmark portfolios that do not include hold ranges and do not incur transaction costs. HML (High minus Low) is the average return on two value portfolios minus the average return on two growth portfolios. (xi) Momentum factor (UMD) (Jegadeesh and Titman, 1993). UMD (Up minus Down) is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios (xii) Currency fluctuation (Elton and Gruber, 1991) measured as the changes in 15-country trade weighted basket of currencies.

The data on economic growth, business conditions and inflation are obtained from *Datastream*; short term interest rates, economic risk premium, future economic variables and currency fluctuations are obtained from *Federal Reserve Bank of St. Louis*; dividend yield and excess return on market portfolio from *CRSP*; and SMB, HML and UMD from *Kenneth French Data Library at Tuck School of Business, Dartmouth College*.

Table 1 reports the descriptive statistics for all the variables. The mean for the institutional sentiments is 20% which suggest that U.S institutional sentiments have been bullish during most of the time frame under investigation. The standard deviation of sentiments is higher than those of the ADR premiums/ discounts. This suggests that institutional sentiments have been volatile during the sample period.

Table 1.
Descriptive
Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Mexico	-0.0055	-0.0020	0.0697	-0.0601	0.0290	0.1167	2.7206
Brazil	-0.0147	-0.0058	0.0872	-0.4093	0.0747	-3.7596	21.2200
Chile	-0.0085	-0.0168	0.0936	-0.1717	0.0446	-0.6500	6.5480
Columbia	-0.0689	-0.0852	0.4885	-0.3972	0.1719	1.0561	5.0842
II	0.2018	0.2260	0.3390	-0.0660	0.0948	-0.8538	3.4787
II_IR	0.1113	0.1145	0.2557	-0.1959	0.0925	-0.7517	4.1652
IIP	0.0022	0.0028	0.0199	-0.0091	0.0054	0.5860	4.3236
T30	0.0041	0.0039	0.0053	0.0032	0.0006	0.6090	2.3879
T90-T30	0.0004	0.0004	0.0017	-0.0003	0.0004	1.0269	4.8031
B10_T30	0.0042	0.0030	0.0527	-0.0440	0.0179	0.1727	4.0376
Baa-Aaa	0.0076	0.0077	0.0105	0.0057	0.0013	0.3590	2.3712
Div	0.0093	0.0117	0.0989	-0.1437	0.0538	-0.5971	3.0455
INF	0.0023	0.0019	0.0082	-0.0006	0.0022	0.9959	3.4234
R_m	-0.0004	0.0148	0.0755	-0.1655	0.0578	-0.7524	3.0545
SMB	-0.0008	-0.0045	0.2138	-0.1626	0.0605	0.9034	6.4524
HML	0.0024	-0.0117	0.1367	-0.1205	0.0599	0.2961	2.6077
UMD	1.3635	1.7300	18.2100	-25.1300	7.8144	-0.6234	5.0755
USD	0.3469	0.1726	4.0346	-3.1701	1.3329	0.2571	3.8052

This table displays the descriptive statistics. The variables are ADR premiums/ discounts of Mexico, Brazil, Chile and Columbia, institutional investor sentiments (II), irrational component of institutional investor sentiments (II_IR) economic growth (IIP), short term interest rates (T30), economic risk premiums (T90-T30), future economic variables (B10-T30), business conditions (Baa-Aaa), dividend yield (Div.), inflation (INF), excess returns on market portfolio (R_m), premium on portfolio of small stocks relative to large stocks (SMB), premium on portfolio of high book/market stocks relative to low book/market stocks (HML), momentum factors (UMD), currency fluctuations (USD).

Table 2 reports the correlations between all the variables. The correlation between institutional investors and Chilean ADR premiums/ discounts is the highest followed by Columbia, Mexico and Brazil. Further, low correlations among the fundamentals suggest that each variable represents a unique risk which is unique in itself.

Table 2.
Correlations

	II	IIP	T30	T90-T30	B10-T30	Baa-Aaa	Div	INF	R_m	SMB	HML	UMD	USD	MEX	BRA	CH	COL
II	1.00	-0.16	0.15	-0.04	0.03	-0.17	0.08	0.12	0.10	0.23	-0.03	-0.05	-0.14	0.08	-0.20	0.41	0.23
IIP		1.00	-0.31	-0.10	-0.07	-0.09	-0.14	-0.12	-0.14	-0.14	-0.08	0.08	0.00	-0.10	-0.05	-0.39	-0.14
T30			1.00	0.11	0.34	-0.20	-0.21	0.07	-0.26	-0.10	0.40	-0.30	0.31	-0.14	0.08	0.11	-0.08
T90-T30				1.00	0.30	-0.02	0.12	0.06	0.11	0.05	-0.22	-0.25	-0.04	-0.18	0.03	0.32	0.09
B10_T30					1.00	-0.16	-0.08	0.12	-0.11	-0.07	0.15	0.17	0.06	-0.37	-0.05	0.02	-0.29
Baa-Aaa						1.00	0.08	-0.15	0.04	-0.18	0.08	-0.10	-0.09	-0.02	-0.33	0.06	0.06
Div							1.00	0.03	0.97	0.01	-0.55	-0.12	-0.42	0.17	0.06	0.56	0.21
INF								1.00	0.05	0.14	-0.02	-0.19	-0.08	0.32	0.08	0.05	0.18
R_m									1.00	0.24	-0.69	0.01	-0.44	0.24	0.07	0.56	0.22
SMB										1.00	-0.62	0.39	-0.12	0.27	-0.06	0.11	0.10
HML											1.00	-0.25	0.21	-0.25	0.08	-0.35	-0.14
UMD												1.00	0.04	0.12	-0.02	-0.21	-0.31
USD													1.00	-0.07	0.05	-0.23	-0.31
MEX														1.00	-0.09	0.08	0.29
BRA															1.00	0.08	-0.13
CH																1.00	0.30
COL																	1.00

This table displays the correlations. The variables are ADR premiums/ discounts of Mexico, Brazil, Chile and Columbia, institutional investor sentiments (II), economic growth (IIP), short term interest rates (T30), economic risk premiums (T90), future economic variables (B10), business conditions (Baa), dividend yield (Div), inflation (INF), excess returns on market portfolio (R_m), premium on portfolio of small stocks relative to large stocks (SMB), premium on portfolio of high book/market stocks relative to low book/market stocks (HML), momentum factors (UMD), and currency fluctuations (USD).

IV. METHODOLOGY

To investigate the postulated relationships, we use the vector auto regression (VAR) model proposed by Sims (1980). A potential problem in including a large number of variables is that the independent variables may not only affect the dependent variable but also feedback on each other such that individual *t*-tests on coefficients become unreliable. Specifically, the variables under question are financial variables which are most likely to be interdependent and therefore the 'structural' relationship between these variables cannot be determined without a priori assumptions. The use of impulse response functions generated from a VAR model is appealing since it incorporates feedback relationships by treating all variables in the system of equations as endogenous.

In an efficient financial market, one would expect the reaction of the market only to the *unanticipated* component of explanatory variables. Elton and Gruber (1991) argue all the variables in a multi index model need to be *surprises* or *innovations* and therefore should not be predicted from their past values. Such estimation would mean ignoring the effect of changes in the *unanticipated* components of institutional investor sentiments and ADR premiums/ discounts and therefore could be misleading. To overcome such potential misspecification problems, one can use the impulse response functions (predicted pattern of surprise changes or innovations) generated from the VAR model.

It also important to consider the transmission of information contained in ADR premiums/ discounts is not always contemporaneous. This is important due to the time delays in the generation and dissemination of information concerning the irrational components. It is also possible reporting delays create lags between the observation of data concerning such variables and the incorporation of this information to ADR premiums/ discounts. Hence, a model in which all variables are measured at time *t*, would imply an unrealistic assumption of *only* contemporaneous association. The *AIC* and *SIC* of the VAR model, also helps in identifying the appropriate lag lengths. Overall a VAR model is well suited for this study since it captures the dynamic feedback in an unconstrained fashion and is therefore a good approximation to the data generating process.

The VAR model is expressed as:

$$R(t) = C + \sum_{k=1}^{m} A(k)R(t-k) + e(t) \qquad (1)$$

where R(t) is a column vector of variables under consideration, C is the deterministic component comprised of a constant, A(k) is a matrix of coefficients, m is the lag length and e(t) is a vector of random error terms.

The VAR specification allows us to do policy simulations and integrate Monte Carlo methods to obtain confidence bands around the point estimates (Doan, 1988; Genberg et al. 1987; Hamilton, 1994). The likely response of one variable to a one time unitary shock in another variable can be captured by impulse response functions. As such they represent the behavior of the series in response to pure shocks while keeping the effect of other variables constant. Since, impulse responses are highly non-linear functions of the estimated parameters, confidence bands are constructed around the mean response. Responses are considered statistically significant at the 95% confidence level when the upper and lower bands carry the same sign.

It is well known theoretically that traditional orthogonalized forecast error variance decomposition results based on the widely used Choleski factorization of VAR innovations may be sensitive to variable ordering (Pesaran and Shin, 1996; Koop, et al., 1996; Pesaran and Shin, 1998). To mitigate such potential problems of misspecifications, we employ the recently developed *generalized impulses* technique as described by Pesaran and Shin (1998) in which an orthogonal set of innovations that does not depend on the VAR ordering.

To capture the effects of irrational component of U.S. institutional investor sentiment, we estimate the following equation:

$$II_{1t} = \theta_0 + \theta_j \sum_{j=1}^{12} Fund_{jt} + \vartheta_t \qquad (2)$$

where θ_0 is the constant, θ_j is the parameters to be estimated; ϑ_t is the random error term. II_{1t} represents the shifts in institutional investor investors at time *t*. $Fund_{jt}$ is the set of fundamentals representing rational expectations based on risk factors that have been shown to carry non-redundant information in conditional asset pricing literature. The residual of equations (2) captures the irrational component of U.S. institutional sentiments (i.e. ϑ_t).

V. RESULTS

The VAR model requires the time series analyzed to be stationary. We perform unit root tests to check the time series properties of each variable. Table 3 reports the unit root tests using Augmented Dickey Fuller (ADF) test (Dickey and Fuller, 1979, 1981). The number of lags is determined to be two based on the consistent and asymptotically efficient *Akaike information criteria (AIC)* and Schwartz information criteria (*SIC)* criteria (Diebold, 2003) and considering the loss in degrees of freedom. For the ADF test, we reject the null hypothesis of non-stationarity for all the series. The inclusion of trend in the ADF test equations does not change these results (Dolado, Jenkinson, and Sosvilla-Rivero, 1990).

Table 3.
Unit root tests

	ADF results
Mexico	-6.0071
Brazil	-6.1960
Chile	-4.9168
Columbia	-5.2728
II	-4.4995
II_IR	-4.2677
IIP	-7.6232
T30	-6.0215
T90-T30	-4.1998
B10_T30	-4.1499
Baa-Aaa	-3.9214
Div	-5.2461
INF	-5.5279
Rm	-4.9863
SMB	-4.4133
HML	-3.4554
UMD	-4.8004
USD	-4.2975
Test critical values: 1% level	-3.5064
5% level	-2.8947
10% level	-2.5842

This table displays unit root tests results using ADF. The variables are ADR premiums/ discounts of Mexico, Brazil, Chile and Columbia, institutional investor sentiments (II), economic growth (IIP), short term interest rates (T30), economic risk premiums (T90), future economic variables (B10), business conditions (Baa), dividend yield (Div), inflation (INF), excess returns on market portfolio (R_m), premium on portfolio of small stocks relative to large stocks (SMB), premium on portfolio of high book/market stocks relative to low book/market stocks (HML), momentum factors (UMD), and currency fluctuations (USD).

To find the irrational component of the U.S. institutional investor sentiments, we estimate the ordinary least square (OLS) regression based on equation (2). Table 4 reports the OLS estimations. We can see that U.S. institutional investor sentiments are significantly related to SMB. Further, the residual values of this regression are generated. The residuals of this regression constitute the irrational component of U.S. institutional investor sentiments.

Table 4

Effect of fundamentals on institutional investor sentiments

Dependent Variable: II				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IIP	0.0910	3.7220	0.0244	0.9807
T30	11.7512	42.9021	0.2739	0.7862
T90-T30	-20.0857	50.3587	-0.3989	0.6931
B10_T30	-0.0849	1.2254	-0.0693	0.9453
Baa-Aaa	-11.0387	13.7610	-0.8022	0.4295
Div	4.2735	3.0988	1.3791	0.1792
INF	0.1276	8.3788	0.0152	0.9880
Rm	-3.7038	2.9507	-1.2552	0.2202
SMB	1.4431	0.7717	1.8699	0.0724
HML	0.4936	0.6578	0.7504	0.4595
UMD	-0.0002	0.0032	-0.0769	0.9393
USD	-0.0074	0.0154	-0.4777	0.6367
C	0.2030	0.2339	0.8681	0.3930
R-squared	0.2185			
Akaike info criterion	-1.4619			
Schwarz criterion	-0.9130			
F-statistic	0.6291			
Log likelihood	42.2372			
Durbin-Watson stat	1.8646			

This table displays regression results of the effect of fundamentals on institutional investor sentiments. The equations is: $II_{1t} = \theta_0 + \theta_j \sum_{j=1}^{12} Fund_{jt} + \vartheta_t$. The variables are ADR premiums/ discounts of Mexico, Brazil, Chile and Columbia, institutional investor sentiments (II), economic growth (IIP), short term interest rates (T30), economic risk premiums (T90), future economic variables (B10), business conditions (Baa), dividend yield (Div), inflation (INF), excess returns on market portfolio (R_m), premium on portfolio of small stocks relative to large stocks (SMB), premium on portfolio of high book/market stocks relative to low book/market stocks (HML), momentum factors (UMD), and currency fluctuations (USD).

To examine the effect of U.S. institutional investor sentiments on ADR premiums/ discounts we estimate a six variable VAR model with two lags. The variables included in this VAR model are ADR premiums/ discounts from Mexico, Brazil, Chile, Columbia, U.S. institutional sentiments and irrational sentiments of U.S. institutional investors.

Figures 1a through 1d plot the impulse responses of premium/discount of ADRs to the overall U.S. institutional investor sentiments. In case of Mexico and Brazil the results are very identical, in that the responses are positive and significant in the first month and insignificant thereafter. Similarly, in case of Chile these relationships are significant and positive during the first month. However, these responses become negative and insignificant during the second month onwards. The Columbian ADR premium/discounts display negative and significant response during the first month.

Figure 1. Response of Mexico, Brazil, Chile and Columbia ADR premiums/ discounts to sentiments of U.S. Institutional Investors

Figure 1a

Response of Mexican ADR premiums/ discounts to sentiments of U.S. Institutional Investors

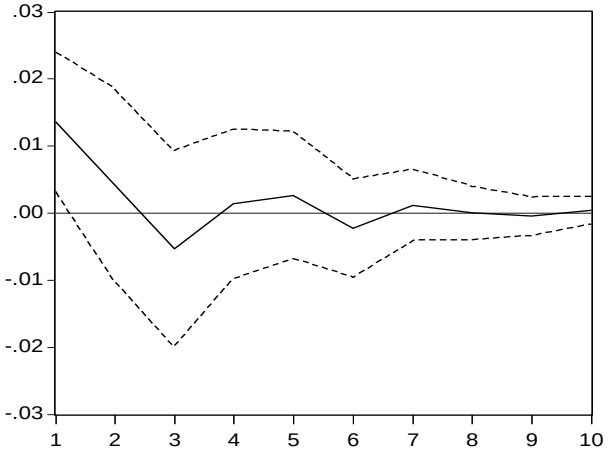


Figure 1b

Response of Brazil ADR premiums/ discounts to sentiments of U.S. Institutional Investors

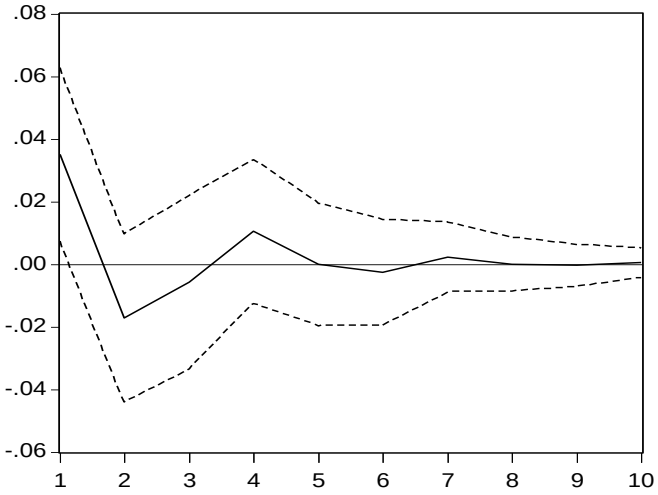


Figure 1c

Response of Chilean ADR premiums/ discounts to sentiments of U.S. Institutional Investors

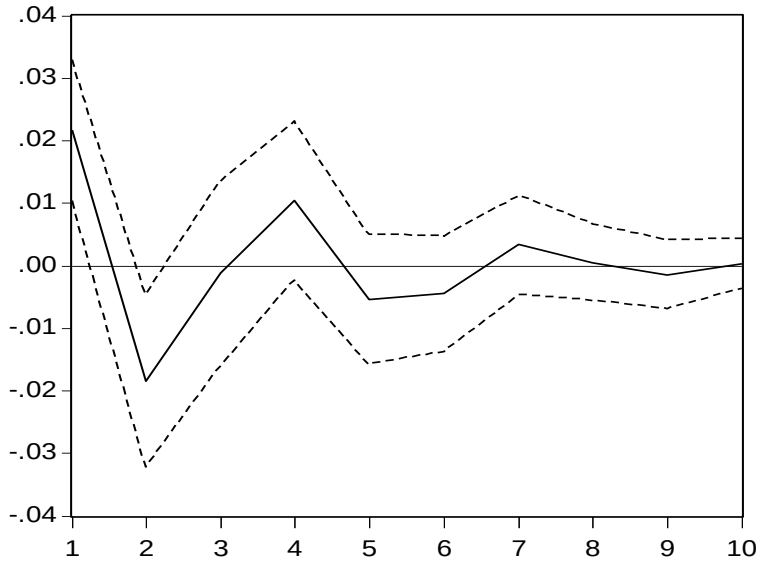
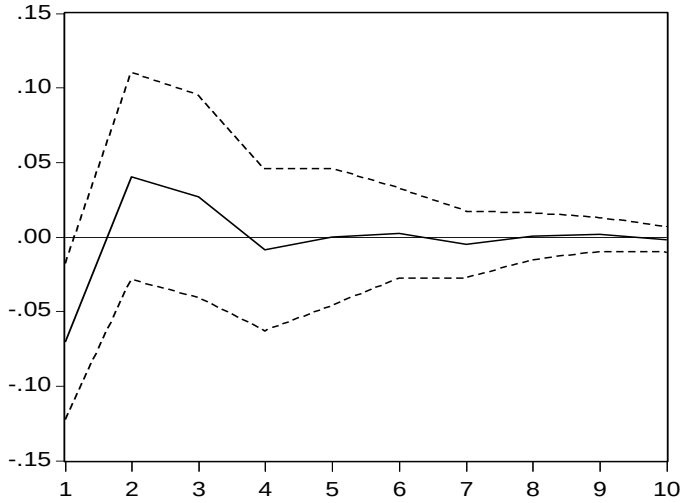


Figure 1d

Response of Columbian ADR premiums/ discounts to sentiments of U.S. Institutional Investors



Overall, U.S. institutional investor sentiments does seem to be a significant variable in explaining the premium/discounts associated with ADRs. These results are consistent with earlier literature on ADR mispricing. Thereafter, in the second set of impulse response functions, we examine our main research

question i.e., whether the irrational component of U.S. institutional investor sentiments cause the mispricing in the ADR market.

Figures 2a through 2d plots the impulse responses of ADR mispricing to irrational exuberance of the U.S. institutional investors. In case of Mexico, there is immediate positive and significant impact of premium/discounts to irrational sentiments of the U.S. investors. These relationships become insignificant thereafter. We did not find any significant response of Brazilian ADR mispricing to these irrational behaviors of the U.S. institutions. The response of ADR mispricing in case of Chile and Columbia are very similar in that they are positive and significant in the first month and insignificant thereafter.

Figure 2
Response of Mexico, Brazil, Chile and Columbia ADR premiums/ discounts to irrational components of U.S. Institutional Investors

Figure 2a
Response of Mexican ADR premiums/ discounts to irrational sentiments of U.S. institutional investors

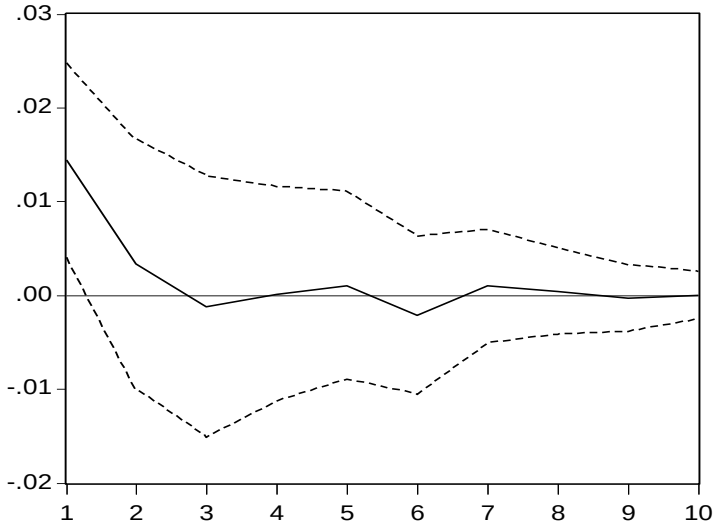


Figure 2b

Response of Brazilian ADR premiums/ discounts to irrational sentiments of U.S. Institutional Investors

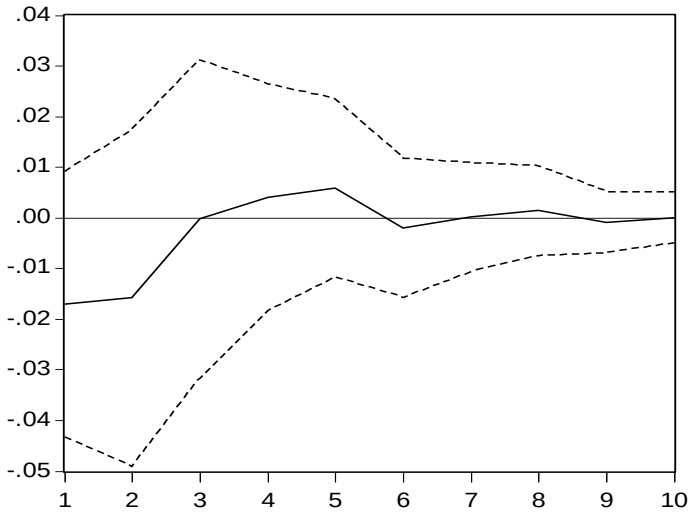


Figure 2c

Response of Chilean ADR premiums/ discounts to irrational sentiments of U.S. institutional investors

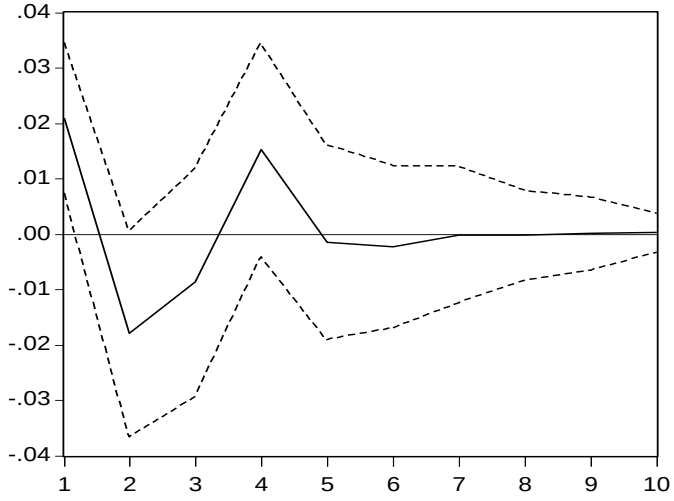
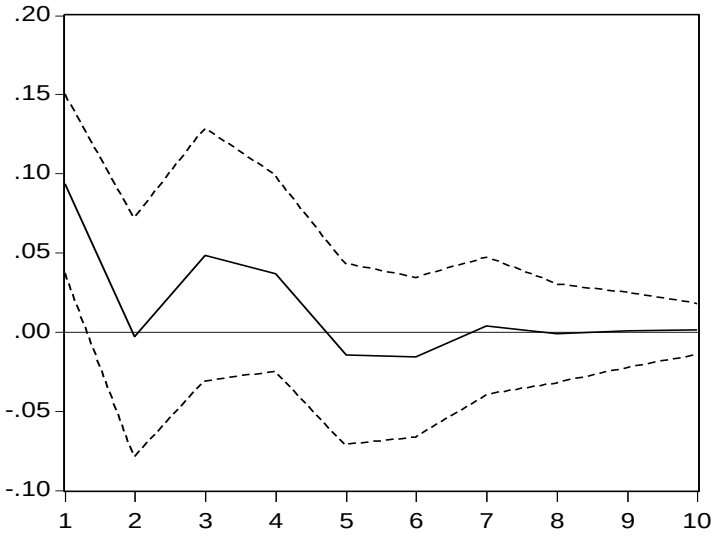


Figure2d

Response of Columbian ADR premiums/ discounts to irrational sentiments of U.S. Institutional Investors



VI. CONCLUSIONS

This paper examines the role of U.S. institutional investor sentiments on ADRs from Mexico, Brazil, Chile and Columbia. We further break-up the institutional sentiments into irrational components and further examine to what extent the premiums or, discounts associated with emerging market ADRs can be attributed to the irrational exuberances of U.S. institutional sentiments.

The results of the impulse response functions generated from the VAR model suggest the following: first, there are significant and immediate positive impact of U.S. institutional investor sentiments on ADRs from Mexico and Brazil. However, in Case of Chile, we find that these immediate postive relationships are followed by negative impact of institutional sentiments on ADR returns. Unlike the response of other Latin Amerircan countries, the ADR returns for Columbia respond negatively to these expecations of the U.S. institutional investors. Second, we find that the irrationality of U.S. institutional investor sentiments are a significant determinant of mispricing in ADRs from Mexico, Chile and Columbia. In all these cases, the responses are immediately positive and insignificant thereafter. We did not find any significant results in case of Mexico.

We argue that irrational bullish sentiments of the U.S. institutional investor might generate immediate gains but subsequently such errors could lead to a larger negative returns and cause greater volatility in the financial

market. These results have important implications for individual investors who make their investment decisions solely based on the popular news media and thereby display herding mentality and intense tendencies to follow institutional investor behavior.

REFERENCES

Baker, M., & Wurgler, J., (2003) Investor sentiment and cross-section of stock returns. *Working Paper, Harvard Business School*.

Bodurtha, J.N., Kim, D.S., Lee, C.M.C., (1995) Closed-end country funds and U.S. market sentiment. *The Review of Financial Studies* 8: 879-918.

Brown, G. W., & Cliff, M. T., (2004) Investor sentiment and the near-term stock market. *Journal of Empirical Finance,* 11(1): 1-27.

Brown, G. W., and Cliff, M. T., (2005) Investor sentiment and asset Valuation. *Journal of Business*, 78(2): 404-440.

Cai, F., and Zheng, l., (2004). Institutional trading and stock returns, *Finance Research Letters* 1, 178-189.

Campbell, (1987) Stock returns and the term structure, *Journal of Financial Economics* 18: 373–399.

Campbell, (1991) A variance decomposition for stock returns, *Economic Journal* 101: 157–179.

Campbell and Shiller, (1988a) The dividend-price ratio and expectations of future dividends and discount factors, *Review of Financial Studies* 1 (1988), pp. 195–228.

Campbell and Shiller, (1988b) Stock prices, earnings and expected dividends, *Journal of Finance* 43: 661–676.

Chan, N., Kan, R., & Miller, M., (1993). Are the discounts on closed-end funds a sentiment index? *Journal of Finance, 48*: 795-800.

Clarke, R. G., & Statman, M., (1998) Bullish or bearish? *Financial Analysts Journal, May/June:* 63-72.

DeBondt, W., (1993) Betting on trends: Intuitive forecasts of financial risk and return. *International Journal of Forecasting, 9*, 355-371.

Dickey and Fuller, (1979) Distribution of the estimators for autoregressive time series with a unit root, *Journal of the American Statistical Association* 74: 427–431.

Dickey and Fuller, (1981) Likelihood ratio statistics for autoregressive time series with a unit root, *Econometrica* 49: 1057–1072.

Diebold, (2003) F.X. Diebold, *Elements of Forecasting*, South Western College Publishing.

Doan, (1988) *RATS User's Manual*, VAR Econometrics, Evanston, Illinois.

Dolado, J.J, Jenkinson, T., and Sosvilla-Rivero, S. (1990) Cointegration and unit roots, *Journal of Economic Surveys* 4: 249–273.

Elton and Gruber, (1991) *Modern Portfolio Theory and Investment Analysis* ((Fourth Edition)), John Wiley and Sons, Inc.

Elton, E., J, Gruber, M., J, & Busse, J., A., (1998) Do investors care about sentiments? *Journal of Business, 71*: 477-500.

Eun, C. S., & Resnick, B. G., (2007) *International Financial Management*. McGraw-Hill.

Fama, E.F., (1970) Efficient capital markets: A review of theory and empirical work, *Journal of Finance* 25: 383–417.

Fama, E.F.(1990) Term structure forecasts of interest rates, inflation, and real returns, *Journal of Monetary Economics* 25:59-76.

Fama, E.F. and French, K.R., (1988) Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33: 3–56

Fama, E.F. and French, K.R. (1989) Business conditions and expected returns on stocks and bonds, *Journal of Financial Economics* 25: 23–49.

Fama, E.F. and French, K.R., (1993) Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33: 3–56.

Fama, E.F. and Schwert, G. W., (1977) Asset returns and inflation, *Journal of Financial Economics* 5: 115–146.

Ferson W.E.,and Harvey, C.R., (1991). The variation in economic risk premiums, *Journal of Political Economy* 99: 385–415.

Fisher, K. L., & Statman, M. (2000). Investor sentiments and stock Returns. *Financial Analysts Journal, March/April:* 16-23.

Gemmill, G., & Thomas, C. D., (2002) Noise trading, costly arbitrage, and asset prices: evidence from closed-end funds. *Journal of Finance, 6:* 2571-2594.

Genberg, M.K., Salemi and A. Swoboda,(1987) The relative importance of foreign and domestic disturbances for aggregate fluctuations in open economy: Switzerland, *Journal of Monetary Economics* 19: 45–67.

Hamilton, J.D., (1994) *Time Series Analysis*, Princeton University Press, Princeton, NJ.

Hodrick, R., (1992) Dividend yields and expected stock returns: Alternative procedures for inference and measurement, *Review of Financial Studies* 5: 357–386.

IFC, (1999) *Emerging Stock Market Fact book*, International Finance Corporation, Washington DC.

Jegadeesh, N. and Titman, S., (1993) Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48: 65–91.

Kato, K., Linn, S., Schallheim, J., (1991) Are there arbitrage opportunities in the market for American depositary receipts? *Journal of International Financial Markets*, Institutions and Money 1: 13-32.

Keim and Stambaugh, R.F. (1986) Predicting returns in the bond and stock markets, *Journal of Financial Economics* 17: 357–390.

Koop, G., Pesaran, M.H., and Potter, S.M. (1996) Impulse response analysis in nonlinear multivariate models, *Journal of Econometrics* 74: 119–147.

Lee, C.M.C., Shleifer, A., Thaler, R., (1991) Investor sentiment and the closed-end fund puzzle. *Journal of Finance* 46: 75-109.

Lee, W.Y., and Jiang, C.X. (2002) Stock market volatility, excess returns, and the role of investor sentiments, *Journal of Banking & Finance* 26: 2277–2299.

Lintner, J. (1965) Security prices, risk, and maximal gains from diversification. *Journal of Finance 20, 4.*

Maldonado, R., Saunders, A., (1983). Foreign exchange restrictions and the law of one price. *Financial Management* spring: 19-23.

Neal, R., & Wheatley, S., (1998). Do measures of investor sentiments predict stock returns? *Journal of Financial and Quantitative Analysis, 34*: 523-547.

Park, J., Tavakkol, A.,(1994). Are ADRs a dollar translation of their underlying securities?: the case of Japanese ADRs. *Journal of International Financial Markets, Institutions and Money* 4: 77-87.

Pesaran, M.H., and Shin, Y. (1996) Cointegration and speed of convergence to equilibrium, *Journal of Econometrics* 71: 117–143.

Pesaran, M.H., and Shin, Y. (1998), Generalized impulse response analysis in linear multivariate models, *Economics Letters* 58: 17–29.

Schwert, G.W. (1990), Stock returns and real activity: A century of evidence, *Journal of Finance* 45: 1237–1257.

Sharpe, W.F. (1964) Capital asset prices: A theory of market equilibrium under conditions of risk, *Journal of Finance* 425–442.

Sharpe, S.A., (2002) Reexamining stock valuation and inflation: The implications of analysts' earnings forecasts, *The Review of Economics and Statistics* 84: 632–648

Sias, R., W, Starks, L., T, & Tinic, S., M., (2001) Is noise trader risk priced? *The Journal of Financial Research, 24*(3): 311-329.

Simpson, M., Ramchander, S., (2002) Is differential sentiment a cause of closed-end country fund premia? An empirical examination of the Australian case. *Applied Economics Letters* 9: 615-619.

Sims, C. (1980), Macroeconomic and reality, *Econometrica* 48: 1–49.

Solt, M. E., & Statman, M., 1988. How useful is the sentiment Index? *Financial Analysts Journal,* September/October(45-55).

Suh, J., (2003) ADRS and U.S. market sentiment. *The Journal of Investing,* 12 (4): 87-95.

Swaminathan, B., (1996). Time-varying expected small firm returns and closed-end fund discounts. *Review of Financial Studies, 9:* 845-887.

Wahab, M., Lashgari, M., (1992). Arbitrage in the American depository market revisited. *Journal of International Financial Markets, Institutions and Money* 2: 97-130.

Zweig, M.E., (1973). An investor expectations stock price predictive model using closed-end fund premiums. *Journal of Finance* 28: 67-78.