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Two Essays on the Role of Information in the Interaction between American Depository Receipts and Their Home Shares: Information Transfer and Issuer Decisions

Oi Lin Cheung
University of New Orleans

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Oi Lin Cheung

B.B.A., University of Macau, 1994
M.B.A., University of Macau, 1997

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

American Depository Receipts (ADRs) represent shares of foreign firms that are issued and traded in the U.S. Since an ADR and its underlying shares represent ownership interest of the same firm, they should be perfect substitutes in a perfect market. However, market imperfections such as differences in information environment, liquidity, investment and trading restrictions, taxes, control right, corporate governance might make them less-than-perfect substitutes. These imperfections, on the other hand, also present opportunities for research.

This dissertation consists of two essays on ADRs, both related to the effects of less-than-perfect information. Specifically, the first essay examines the return and volatility transfers between ADRs and their underlying home shares. Our investigation differs from the previous studies in that we cover substantially more countries and that we attempt to explain the variations in the extents of transfer effects both across firms and across countries. Various hypotheses are developed, based on the premise that barriers associated with trading, investments, and corporate governance would lower the extent or effectiveness of transfers. Overall, our empirical results support these hypotheses.

The second essay takes the viewpoint of the issuing firms. Supposedly, an issuer's timing and dollar amount raised depend on the conditions of three markets: its home equity market, the U.S. equity market, and the currency market. From purely the standpoint of information accessibility, ADR issuers are likely to time their issues or set their amounts with respect to the conditions of the home equity market and/or currency market, with which they are more familiar. On the other hand, issuers typically employ the assistance of U.S. investment banks, and therefore they may be well-informed about the U.S. equity market. This is largely an empirical issue. Generally, our empirical results are mixed, but there is somewhat stronger evidence for the

U.S. equity market being more important when setting the issue amount. There is also evidence that suggests regulations having influences on such activities.

JEL Classification: C32, D82, F39, G14, G18, G39

Keywords: ADR, Information Transmission, Return Transfer, Volatility Transfer, Investment Restriction, Investor Protection, Ownership, GARCH Model, Market Timing, Information Asymmetry, Country Regulation

CHAPTER 1
DETERMINANTS OF RETURN AND VOLATILITY TRANSFER BETWEEN ADRS AND THEIR UNDERLYING STOCKS

1.1 Abstract

This essay examines both the return and volatility transfers between American Depository Receipts (ADRs) and their underlying stocks. The sample consists of 145 ADR-underlying stock pairs of firms in 25 countries trading during the period from January 2003 to December 2007. Our investigation differs from the previous studies in that we cover substantially more countries and that we attempt to explain the variations in the extents of transfer effects across firms and countries. Various hypotheses are developed, based on the premise that barriers associated with trading, investments, and corporate governance would lower the extent of transfers. Overall, our results support the hypotheses. Some of the notable and significant results are described as follows. The extent of market developments increases the bi-directional return transfers and the unidirectional volatility transfers from the ADRs to their underlying stocks. Corporate governance, as measured by disclosure requirement, tends to promote information transfer. Noise trader risk lowers the return transfer from the underlying stocks to the ADRs and the volatility transfer in the reverse direction. Synchronicity lowers the return transfer from the ADRs to their underlying stocks but increases it in the opposite direction and the bi-directional volatility transfer as well. Proportion of trading in the U.S. increases the return transfer from ADRs to their underlying stocks. Market liquidity increases the return transfers but lowers the volatility transfer from the ADRs to their underlying stocks. Taken together, these findings indicate that trading and governance have effects on the magnitude of return and volatility transfer effects.

1.2 Introduction

If two markets are closely linked in the form of derivatives and their underlying securities, changes in price in one market due to the arrival of new information should introduce simultaneous and/or lagged changes in prices to the other market. As a result, return and/or volatility could be transferred between markets via the flow of information. Therefore, research on such transfer effects can provide useful insight into how information is transmitted and disseminated between these markets.

The majority of empirical studies on return and volatility transfer effects between American Depository Receipts (ADRs) and their underlying stocks focus on a single country. This paper aims to provide a more comprehensive cross-country study on these transfer effects. Moreover, we hypothesize that investment restrictions that impede trading will hinder information transfer while those promoting trading will facilitate it. Country- and firm-specific attributes that reflect trading barriers and information asymmetry encountered by investors should have an impact on the information transmission which in turn leads to return and/or volatility transfer(s). This study should also provide some implications for cross-border information transfer.

We find that, after controlling for the U.S. equity, home equity and home currency market returns, the extent of home market developments increases the bi-directional return transfer and the volatility transfer from the ADRs to their underlying stocks. Disclosure requirement increases the return transfer from the ADRs to their underlying stocks and the volatility transfer in the opposite direction. Shareholders' ability to sue officers and directors for misconduct lowers the return transfer in both directions and the volatility transfer from the ADRs to their underlying stocks. Institutional ownership lowers the volatility transfer from the ADRs to their underlying stocks. Noise trader risk lowers the return transfer from the underlying stocks to the ADRs and the volatility transfer from ADRs to their underlying stocks. Synchronicity lowers the return transfer from ADRs to their underlying stocks but increases it in the opposite direction. It also increases the bi-directional volatility transfer. Proportion of trading in the U.S. increases the return transfer from ADRs to their underlying stocks. Market liquidity increases the return transfers but lowers the volatility transfer from the ADRs to their underlying stocks. Overall, the results are largely consistent with our hypotheses that barriers to trading and investments affect the transfer of information across borders.

The rest of this essay is organized as follows: Section 1.3 gives a review of the previous studies on return and volatility spillover or transfer effects among stock markets, with particular focus on those between the markets for ADRs and their underlying stocks. Section 1.4 contains a detailed explanation of the hypotheses to be tested. Section 1.5 provides a description of the methodologies. Section 1.6 describes the data sources and sample construction. This is followed by Section 1.7 on the empirical results and related discussions. Concluding remarks are given in Section 1.8.

1.3 Literature Review

Most of the studies on the transmission of information in terms of return and volatility spillover or transfer effects utilize data from a few national markets. Among them are Eun and Shim (1989), Hamao, Masulis and Ng (1990), Ito and Lin (1993), Theodossiou and Lee (1993), Lin, Engle and Ito (1994), King, Sentana and Wadhwani (1994), Karolyi (1995), Brailsford (1996) and Su and Tsai (1996), Liu and Pan (1997), Wang and Firth (2004), Balasubramanyan (2004), Bala and Premaratne (2004), Johansson and Ljungwall (2006), Pascual-Fuster and

Perez-Rodriquez (2006). These studies, as summarized in Table 1.1, apply different variations of the Generalized Autoregressive Conditional Heteroscedascity (GARCH) and/or Vector Autoregressive (VAR) models on developed markets such as U.S., U.K., Japan and Germany and more recently on emerging markets including China, Korea, Taiwan and Thailand. Their major findings are: (i) bi/multi-lateral spillovers are observed in some international stock markets, (ii) significant return and volatility spillovers are found from the U.S. or Japan markets to the other national stock markets and (iii) volatility spillovers are stronger from the larger (dominant) markets to the relatively smaller ones, (iv) return and volatility spillover effects are time varying. Although the movements of the markets are highly correlated, covariance between their returns largely cannot be explained by economic factors such as interest rates, exchange rates and the real money supply.

Table 1.1 Selected Studies on Return and Volatility Spillover Effects on National Stock Markets

Study	Model Selection	Sample Countries	Sample Period	Major Findings
Eun and Shim (1989)	VAR	The world's 9 largest stock markets (including Australia, Canada, etc.)	Dec 31, 1979 to Dec 20, 1985	• Substantial amount of multi-lateral interaction occurs among national stock markets. • Innovations in the U.S. are rapidly transmitted to other markets whereas no single foreign market can significantly explain the U.S. market movements
Hamao, Masulis and Ng (1990)	MA(1) -GARCH (1,1)	U.S., U.K. and Japan	Apr 1985 to Mar 1988	• Volatility spillover was seen significant in U.S.-U.K before the 1987 crash whereas in all sample countries after the crash.
Ito and Lin (1993)	Signal extraction model with time varying variance	Tokyo and New York	Oct 1985 to Dec 1991	• Price information transmission of stocks between Tokyo and New York is a result of volatility surges rather than trading volume surges.
Theodossiou and Lee (1993)	Multivariate GARCH-M	U.S., Canada, Japan, U.K. and Germany	1980 to 1991	• Significant stock return and volatility spillover effects among the 5 countries, to a different extent between different pairs of countries • U.S. market returns spillover to U.K., Canada and Germany • Japan market returns spillover to Germany • U.S. market volatility to the other four markets, U.K. only to Canada and Germany to Japan
Lin, Engle and Ito (1994)	A signal extraction model with GARCH process	Tokyo and New York	Oct 1, 1985 to Dec, 29, 1989	• Bi-directional spillovers between New York and Tokyo.
King, Sentana and Wadhwani (1994)	Multivariate factor asset pricing model	16 national markets	Jan 1979 to Oct 1988	• Only a small proportion of the covariances between markets can be accounted for by economic factors such as interest rates, exchange rates and the real money supply.

Table 1.1. (cont.)

Study	Model Selection	Sample Countries	Sample Period	• Major Findings
Karolyi (1995)	Bivariate GARCH	U.S. and Canada	Apr 1981 to Dec 1989	• Towards the end of the 80s, the impact of U.S. market volatility on Canada gradually died down.
Brailsford (1996)	GJR-GARCH	Australia and New Zealand	Jan 1974 to Sep 1991	• Volatility surprises in the larger Australian market influence the subsequent conditional volatility of smaller New Zealand market and the other way round
Su and Tsai (1996)	MA(1)-GARCH(1,1)	Japan, Korea, Singapore, Hong Kong and Taiwan	Jan 1982 to Dec 1993	• Significant return and volatility spillover between Japan and Taiwan before the 1987 crash whereas the two types of spillover occur among all the five markets after the crash. • Results suggests the markets had a tendency to become integrated • Findings similar to Hamao, Masulis and Ng (1990)
Liu and Pan (1997)	ARMA(1,1), GARCH(1,1)-M	U.S., Japan, Hong Kong, Singapore, Taiwan and Thailand	1984 to 1991	• Index returns and volatility spillover effects intensify over time after the 1987 crash, in particular U.S. market has a more remarkable impact on the Asian stock markets than does Japan
Wang and Firth (2004)	Univariate GARCH	Greater China, Japan, U.S. and U.K.	1994 to 2001	• The overnight returns on all the Greater China stock indices can be estimated by using information from at least one of the three developed markets' daytime returns. • The contemporaneous return spillovers are in general unidirectional from more advanced major international markets to the Chinese markets
Balasubramanyan (2004)	DCC-GARCH (Dynamic Conditional Correlation-GARCH)	U.S., U.K. and Japan	Jan 2, 1984 to Jul 22, 2004	• Statistically significant spillover and comovement between U.S., U.K. and Japan • Financial markets and their assets are both statistically economically related

Table 1.1. (cont.)

Study	Model Selection	Sample Countries	Sample Period	Major Findings
Bala and Premaratne (2004)	Univariate GARCH and Multivariate and Asymmetric Multivariate GARCH	U.S., U.K., Hong Kong, Japan and Singapore	1992 to 2002	• A high degree of co-movement between the Singapore stock market and the stock markets of Hong Kong, U.S. and U.K. (in that order). • Small but significant volatility spillover from Singapore into Hong Kong, Japan and U.S. despite the latter three are dominant markets.
Johansson and Ljungwall (2006)	Multivariate EGARCH	Greater China region (Mainland China, Hong Kong and Taiwan)	1994 to 2005	• Both China and Hong Kong are affected by mean spillover from Taiwan while Hong Kong and Taiwan show signs of feedback relationship in their volatility process. • Mainland China market is much less interdependent with the other two markets whereas Hong Kong show clear bi-directional spillover effects.
Pascual-Fuster and Perez-Rodriquez (2006)	VAR-GARCH	U.S., Japan and Europe (either London/Frankfurt)	Dec 12, 1996 to Dec 12, 2000	• Higher volatility transmission from Japan to the foreign markets (U.S. or European) for Japanese firms with significant business activity in the foreign market's time zone geographical area. Weaker empirical evidence of higher transmission from the foreign markets to Japan for Japanese firms with fewer business interests in these market's time zone geographical area.

Recently, more research attention is paid to the interrelationship between ADRs and their underlying stocks or home market index. This research includes but is not limited to studies on information transmission in terms of return and volatility transfers between ADRs and their underlying stocks. Park (1995) examines the variance of ADR returns and provides evidence that while information about the price of the underlying stock can largely explain the variability in ADR returns, trading noises also affect ADR volatilities. By using a Vector Error Correction (VECM) Model and some VAR Models to analyze the dynamic relationships between ADRs and home market portfolios, Jiang (1998) documents that interrelationships exist between international markets. He is able to demonstrate that ADRs are in general affected by their respective home market index whereas the reverse effect depends on the degree of cointegration between markets. Additionally, U.S. equity market returns and currency market returns are significantly correlated with the ADR returns.

Several other studies, outlined below, examine the return and volatility transfer between ADRs and their underlying stocks. However, none of them analyzes the role of investment restrictions in the process of information resolution. Hauser, Tanchuama and Yarri (1998) investigate Israel stocks that are listed on both the Tel Aviv Stock Exchange and NASDAQ using Autoregressive Integrated Moving Average (ARIMA) and VAR models. They find that price changes in the U.S. are strongly affected by those changes in Israel that occurred earlier the same day. On the other hand, the impact in the opposite direction is considerably weaker. Alaganar and Bhar (2001) apply a similar VAR model to examine the direction and magnitude of information flow between Australian ADRs and their underlying stocks. They find that ADR market is in general informationally efficient and follows the law of one price. Chen, Chou and Yang (2002) investigate the Granger causality between Taiwan ADRs or GDRs (Global

Depositary Receipts) and their respective underlying stocks. Their result suggests that there is a unidirectional causality from Taiwan to the foreign markets; additionally prices in both markets are consistent with a long run co-integrated equilibrium. A relatively more comprehensive study is given by Yang, Doong, Wang and Chang (2005). They apply a GARCH model to investigate the intra-day return and volatility transfer effects between ADRs and their underlying stocks in Japan, Taiwan, Korea, Hong Kong and Singapore. They find that the return transfers are bi-directional, with stronger effect from the underlying stocks to their ADRs than those in the opposite direction. On the other hand, the volatility transfers are unidirectional from the underlying stocks to ADRs only. Like Chen, Chou and Yang (2002) and consistent with the related literature on entire national markets, this evidence implies that home market is acting as the dominant market while the foreign market is a satellite. The findings in these studies are also consistent with Park (1995), in that the variance of ADR returns decline by more than half on the home market exchange holidays when there is no trade possible for the underlying stocks than on ordinary days. Nevertheless, none of these studies has presented an explanation on why the strength of such transfer effects might differ across countries.

1.4 Hypotheses

In this essay, we present six hypotheses, with all based on the idea of exploring how market-based factors (market development associated restrictions, short sell restrictions, and investor protection), information-based factors (insider ownership, institutional ownership, noise trader risks and synchronicity with home market returns) and trading-based factors (proportion of trading in U.S. and market liquidity of the issuing firm's stock) affect the return and volatility transfers between ADRs and their underlying stocks.

Hypothesis 1:

The higher the degree of trading barriers[1], the higher the return and volatility transfer effects between ADRs and their underlying stocks.

Investors trading in securities of less developed countries are likely to encounter more investment restrictions than those trading in securities of more developed countries. In particular, trading in the less developed countries can be limited due to impediments arising from market frictions and imperfect information. It is expected that the greater the home market investment restriction, the lower the transfer effects.

[1] Whereas ADRs of most countries can be issued or cancelled at any time (i.e. a 'two-way market"), ADRs of some countries such as Korea, Taiwan and India have some restrictions on their issuance. In these markets, common shares are subject to limitations when converted to ADRs after sale of the ADRs and the subsequent cancellation. There is a limit on how many common shares can be deposited. Under the circumstances when the limit is reached, the ADRs will be closed for re-issuance. Other markets that have different forms of restricted country accessibility are Egypt and Pakistan (both have risky settlement procedures), Venezuela (control the movement of capital), Italy (difficult to reclaim local taxes due on the purchase of local shares), Brazil, U.K. and Japan (difficult to transfer taxes due on the purchase of local shares). While most of the restrictions affect the trading of underlying stock only, some of them might affect the trading of ADRs as well. See JP Morgans (2008) and Citigroup(2005) for more detail.

Hypothesis 2:

The greater the investor protection in the home market, the higher the return and volatility transfer between ADRs and their underlying stocks.

Investors may be less willing to trade ADRs if they find that the laws protecting the public investors from corporate insiders are relatively weak. As such, relatively lower investor protection in a country should hinder trading activities. We expect greater home market investor protection will lead to higher transfer effects.

Hypothesis 3:

The greater the institutional ownership of the underlying stock, the higher the expected transfer effect, assuming that institutional holdings reduce information asymmetry. Insider holding is expected to reduce the transfer effects.

If institutional ownership is high, information asymmetry is possibly lower [Merton (1987)]. As lower information asymmetry will induce more market depth and ease of trading, we would expect institutional ownership being positively related to return and volatility transfers between ADRs and underlying stocks. On the other hand, investors likely would avoid trading in stocks with high information asymmetry between corporate insiders and outside shareholders. If insider ownership is higher, information asymmetry is likely higher, which in turn lowers the effectiveness of transfer.

Hypothesis 4:

Noise trader risk is negatively related to the return and volatility transfers between ADRs and their underlying stocks.

Noise traders are those who trade on their own erroneous beliefs. At times, they can affect prices and can earn higher expected returns. However, the unpredictability of their beliefs might create a risk for other investors, especially short-term traders [DeLong, Shleifer, Summers and Waldman (1989, 1990) and Shlifer and Vishny (1997)]. As a result, short-term traders might not be able to estimate with a reasonable degree of certainty the extent by which the market price would diverge from its fundamental value. This increases their trading risk thus lower the extent of transfer.

Hypothesis 5:

The greater the synchronicity of the underlying stock's price movement with the home equity market performance, the greater the transfer effect.

Idiosyncratic risk can also be estimated by one minus the fraction of the variation of stock returns relative to the market return (i.e. 1- R^2 of regressing a stock's return on the market return [Roll (1988), Morck, Yeung and Yu (2000), Barberis, Shleifer and Wurgle (2002)]). [2] Relatively higher R^2 stocks (highly synchronized with home equity market movement and thus have less idiosyncratic risk) are subject to less information asymmetry. The higher the R^2 of the underlying stock, the greater the liquidity, leading to stronger transfer effects.

[2] Alternatively, in market microstructure literature, noise traders are sometimes thought of as liquidity traders. Liquidity traders might actually help arbitrage, since the existence of liquidity traders means a deeper market.

Hypothesis 6:

Market liquidity of issuing firm's stocks increases the return and volatility transfer between the ADRs and their underlying stocks.

Investors are likely more able to trade on their information, in terms of extent and timeliness, when the securities are more liquid. Therefore, market liquidity of the issuing firm's securities is expected to be positively related to return and volatility transfers between ADRs and underlying stocks.

1.5 Methodologies

Daily returns of the ADRs and their underlying stocks are calculated as in the following.

$R_{i,t} = \ln(P_{i,t} / P_{i,t-1})$ -----------------------(1)

where $R_{i,t}$ is the return of ADR i/underlying stock i from day t-1 to day t

$P_{i,t}$ and $P_{i,t-1}$ are the prices of ADR i/underlying stock i on day t and day t-1 respectively.

The returns are then fitted into an MA(1)-GARCH (1,1)-M model [Bollerslev(1987), French, Schwert, and Stambaugh(1987), Hamao, Masulis and Ng (1990), Wang, Rui and Firth (2002)] to study whether the return and volatility transfer effects between the ADRs and their underlying stocks are significant. Due to the nonsynchronous trading in the ADRs and their underlying stocks, it is highly likely that their returns include a small, short-lived serial correlation. Incorporating a first-order moving average, MA(1), in the conditional return equation will help to control for this problem [Hamao, Masulis and Ng (1990)].

The corresponding MA(1)-GARCH (1,1)-M model is given in the following.

$$R_{i,t}^{ADR} = \alpha_0 + \alpha_1 R_{i,t}^{UDL} + \alpha_2 h_{i,t}^{ADR} + \alpha_3 \varepsilon_{i,t-1}^{ADR} + \varepsilon_{i,t}^{ADR}, \qquad \varepsilon_{i,t}^{ADR} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{ADR}\right),$$

$$h_{i,t}^{ADR} = \exp(a_0 + a_1\left(\varepsilon_{i,t}^{UDL}\right)^2) + a_2\left(\varepsilon_{i,t-1}^{ADR}\right)^2 + a_3 h_{t-1}^{ADR} \text{-----------------------}(2)$$

$$R_{i,t}^{UDL} = \beta_0 + \beta_1 R_{i,t}^{ADR} + \beta_2 h_{i,t}^{UDL} + \beta_3 \varepsilon_{i,t-1}^{UDL} + \varepsilon_{i,t}^{UDL}, \qquad \varepsilon_{i,t}^{UDL} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{UDL}\right),$$

$$h_{i,t}^{UDL} = \exp(b_0 + b_1\left(\varepsilon_{i,t}^{ADR}\right)^2) + b_2\left(\varepsilon_{i,t-1}^{UDL}\right)^2 + b_3 h_{t-1}^{UDL} \text{-----------------------}(3)$$

where

$R_{i,t}^{ADR}$ = daily return of ADR i from day t-1 to day t

$R_{i,t}^{UDL}$ = daily return of ADR i's underlying stock from day t-1 to day t

$h_{i,t}^{ADR}$ = conditional return volatility of ADR i of day t

$h_{i,t}^{UDL}$ = conditional return volatility of ADR i's underlying stock of day t

$\varepsilon_{i,t}^{ADR}$ = the return residuals of ADR i of day t

$\varepsilon_{i,t}^{UDL}$ = the return residuals of ADR i's underlying stock of day t

Ω_{t-1} = the information set observed by investors in day t-1

Following Judge et. al (1985), the functional form of the multiplicative heteroscedasticity used in the above model is exponential instead of linear as in Hamao, Masulis and Ng (1990) and Wang, Rui and Firth (2002). The advantage of using an exponential form in the conditional variance is that it helps eliminating the possibility of negative variance.

For the markets with few trading barriers, if the estimates of the coefficients, α_1 and β_1 are significantly different from zero (i.e. rejecting $H_0 : \alpha_1 = 0, \quad \beta_1 = 0$), then the return of an ADR and that of its underlying stock can be interpreted to be affected by each other. Similarly, if the estimates of the coefficients, a_1 and b_1, are significantly different from zero (i.e. rejecting $H_0: a_1 = 0, \quad b_1 = 0$), then the volatility of an ADR and that of its underlying stock can be interpreted to have some impact on each other.

The significant transfer effects (i.e. the significant estimates of α_1, β_1, a_1 and b_1 obtained in (2) and (3) above) are then regressed on the variable proxies for investment restrictions, investor protection, ownership structure, noise trader risk, synchronicity, proportion of trading in U.S., and the market liquidity of the issuing firm's stocks as in the following regression model.

$$\begin{aligned} \text{Transfer}_i = \varphi &+ \gamma_1 \text{Ln(PCGNI)}_i^H + \gamma_2 \text{ShortSell}_i^H + \gamma_3 \text{Distance}_i^H + \gamma_4 \text{Disclosure}_i^H + \gamma_5 \text{DirectorLiab}_i^H \\ &+ \gamma_6 \text{ShdhlderSuit}_i^H + \gamma_7 \text{Insider}_i + \gamma_8 \text{Institutional}_i + \gamma_9 \sigma_{\varepsilon i} + \gamma_{10} R_i^2 + \gamma_{11} \%\tau_i^{ADR} \\ &+ \gamma_{12} \left(\%\tau_i^{ADR}\right)^2 + \gamma_{13} \text{Ln(MCAP)}_i + \varepsilon_i \end{aligned} \quad \text{-----------------------(4)}$$

where Transfer_i is return/volatility transfer effect (significant at least at 5% level) between an ADR and its underlying stock

LN(PCGNI)_i^H is the logarithm of average per-capita home market GNI from 2003 to 2006. This serves as a proxy for the extent of development of the home equity market

ShortSell_i^H is a dummy variable equals 1 if investors are allowed to short sell shares and they also practice shortselling in the home market and 0 otherwise

Distance_i^H is the number of miles separating a given country's main stock exchange from New York

$Disclosure_i^H$ is the average of the home market Disclosure Index (transparency of transaction) level of 2006 and 2007

$DirectorLiab_i^H$ is the average of the home market Director Liability Index (liability for self-dealing) level of 2006 and 2007

$ShdhldSuit_i^H$ is the average of the home market ease of Shareholder Suit Index (shareholders' ability to sue officers and directors for misconduct) level of 2006 and 2007.

$Insider_i$ is the insider ownership of the issuing firm of the ADR i and its underlying stock as at the end of 2007

$Institutional_i$ is the institutional ownership of the issuing firm of the ADR i and its underlying stock as at the end of 2007

$\sigma_{\varepsilon i}$ is the average of the standard deviation of the international market model return residuals of the underlying stock and that of the ADR of the issuer i[3]. This variable is used as a proxy for the aggregate noise trader risk.

[3]Gagnon and Karolyi (2004) use the standard deviation of the return residuals of the international market model of the home shares. Since the standard deviation of return residuals of the international market model is quite different between the ADRs and home shares, therefore, this paper uses the average of the two to represent the noise trader risk.

R_i^2 is a firm-level measure of synchronicity or common co-movements in the stock prices. It is estimated by the adjusted coefficient of determination of the market model regressing the underlying stock returns on the home market returns for each sample firm. High value indicates little firm-specific information can be capitalized into the stock price changes

$\%\tau_i^{ADR}$ measures the proportion of trading in U.S. It is the percentage of an issuing firm's aggregate turnover traded in the form of ADRs in New York. [$\left(\%\tau_i^{ADR}\right)^2$ is added to capture the non-linear effects in the regression as in Gagnon and Karolyi (2004)].

$Ln(MCAP)_i$ is the logarithm of the average of issuing firm i's stock market capitalization of 2003 and 2006. This is used as a firm-specific proxy for market liquidity

Like Hamao, Masulis and Ng (1999), observations with missing data either in ADRs or their underlying stocks due to the close of exchanges will be excluded from the data points. Hamao, Masulis and Ng (1999) claim that this method of handling nonsynchronous trading among different markets does not affect the reliability of the results.

In the Regression Model (4) above, Gross National Income (GNI)[4] per capita is used to proxy market development. That is, home market based restrictions are measured by the logarithm of GNI of home market. Moreover, we investigate how two other market-based restrictions on investors, namely short-sales restriction (Bris, Geotzmann and Zhu (2007)) and

[4]Previously known as GNP, however, since 2001, the World Bank refers to the GNP as the GNI.

distance from U.S., both of which might slow down information-trading, which in turn influence the transfer effects. However, instead of using time zone to measure the distance, we use the actual mileage. With the asymmetric treatment of short sales in the ADR and home markets, the deviations from price parity are less likely to dissipate quickly. It is because investors in countries with short sales restrictions may not be able to trade and incorporate the relevant information into the prices in a timely manner. The distance between the home market and U.S. (measured by the number of miles that separate the U.S. and home markets) may also affect the ability of information traders to force the convergence of ADR and home market prices. This is because the farther apart two markets are, the more difficult investors might have in accessing one market from the other. The value of disclosure index, director liability index and the value of ease of shareholder suit index of home market are jointly used to proxy for the home market investor protection. The underlying stock's market capitalization is taken as the firm-specific proxy for its market liquidity. To estimate the proportion of trading in U.S., we compute the percentage of the ADR issuing firm's aggregate turnover traded in the U.S. for each ADR-underlying stock. For the estimation of the noise trader risk, we take the average of standard deviation of the international market model's residuals of the ADRs and that of their underlying stocks. The variable R^2 is the adjusted R^2 obtained when the underlying stock returns are regressed on home market returns.

1.6 Data and Sample Description

Data concerning ADRs are drawn from the adr.com website (http://www.adr.com) which is a joint project run by JPMorgan Chase Bank, N.A. ("JPMorgan") and Thomson Financial.

Detailed information such as ADR name, ticker, listed exchange, level, industry, country, underlying stock ticker, underlying stock exchange, ratio of ADR to ordinary share and effective date can be obtained from their ADR universe. The sample is cross-checked with the depository universes of Citigroup and Bank of New York as well as the databases of Compustat and Security Data Company (SDC). Daily close prices of the matching pairs of ADRs and their underlying stocks, home equity market indexes and U.S. equity market daily close values are downloaded from the Yahoo Finance website or Reuters Data Link. Returns of world market index (S&P Global 1200 Stock Issues), which is used in the international market model for estimating the noise trader risks, are obtained from Reuters Data Link. Daily close foreign exchange rates are obtained from Reuters Data Link. Values of the investor protection indexes and per capita GNI are downloaded from the World Bank Group website (http://www.doingbusiness.org). Short sell data are extracted from Bris, Geotzmann, and Zhu (2007). Mileage information is obtained from the WebFlyer website (http://www.webflyer.com/travel/milemaker/getmileage.php). Ownership structures of the ADR issuers and their market capitalization are downloaded from the MSN Money website (http://moneycentral.msn.com/ownership) and obtained from Compustat respectively.

Only ADRs of Level II (non-capital raising) and Level III (capital raising) are included in the sample since they are listed on one of the major stock exchanges in U.S. and are subject to similar regulations from the SEC. The sample period spans from January 2003 to December 2007, i.e. the post Sarbanes-Oxley Act era. The sample includes 145 ADR-underlying stock pairs listed on U.S. stock exchanges and the stock exchanges of 25 countries. Some descriptive summary on the sample is displayed in Table 1.2 and Table 1.3.

Table 1.2 shows the sample distribution from various countries and regions. Among the countries, U.K. (24) has the most ADR-underlying stock pairs whereas Belgium, Finland, Greece, Indonesia, Portugal and Sweden each have only one pair. In terms of overall investor protection, Hong Kong (8.9) scores the highest while Greece (3) and Switzerland (3) are ranked the lowest. Norway (with average GNI per capita of US$56,850) is deemed to be the wealthiest country whereas India (with average GNI per capita of $678) the poorest among the countries in the sample. All the countries in the sample except Indonesia, South Korea and Greece allow for short-selling in security trading. However, investors in Argentina, Brazil, Finland, India, Israel and Spain do not practice short-selling even though there is no such restriction in these markets. Being the furthest market away from U.S., Indonesia is about 10,000 miles from New York.

Table 1.2 Country Characteristics of the American Depository Receipts (ADRs) and Underlying Stock Pairs

This table reports the country characteristics of the ADR-underlying stock pairs. The countries are grouped under 5 regions. Country values of the investor protection indices and GNI per capita are downloaded from the World Bank Group website. Short-sell restrictions and practices data are extracted from Bris, Goetzmann and Zhu (2007). Information on mileage is downloaded from the WebFlyer website. Regional mean shows the country average of the values of the variables in the region.

		Mean Investor Protection (2006&2007)						
Country	**Number of ADR-UDL Pairs**	**Disclosure Index**	**Director Liability Index**	**Shareholder Suits Index**	**Investor Protection Index**	**Mean GNI Per Capita (2003 - 2006, US$)**	**Short-Sell Restriction (Practiced)**	**Distance from New York (miles)**
Asia Develop								
Australia	7	8	2	7	5.7	29,900	No (Yes)	9,935
Hong Kong	14	10	8	8.5	8.9	27,603	No (Yes)	8,050
Japan	17	7	6	8	7	36,918	No (Yes)	6,750
	Regional mean	***8.3***	***5.3***	***7.8***	***7.2***	***31,473***		***6,130***
Asia Emerging								
India	5	7	4	7	6	678	No (No)	7,780
Indonesia	1	9	5	3	5.7	1,178	Yes (No)	10,000
South Korea	6	7	2	7	5.3	14,915	Yes (No)	6,870
	Regional mean	***7.7***	***3.7***	***5.7***	***5.7***	***5,590***		***7,510***
Europe Develop								
Belgium	1	8	6	7	7	33,165	No (Yes)	3,650
Finland	1	6	4	7	5.7	35,305	No (No)	4,100
France	8	10	1	5	5.3	31,830	No (Yes)	3,620
Germany	3	5	5	5	5	31,980	No (Yes)	3,840
Greece	1	1	3	5	3	22,688	Yes (No)	4,920
Ireland	6	10	6	9	8.3	37,445	No (Yes)	3,170
Italy	2	7	4	6	5.7	27,793	No (Yes)	3,980

Table 1.2 (cont.)

Country	Number of ADR-UDL Pairs	Mean Investor Protection (2006&2007) Disclosure Index	Director Liability Index	Shareholder Suits Index	Investor Protection Index	Mean GNI Per Capita (2003 - 2006, US$)	Short-Sell Restriction (Practiced)	Distance from New York (miles)
Netherlands	2	4	4	6	4.7	36,720	No (Yes)	3,630
Norway	2	7	6	7	6.7	56,850	No (Yes)	3,670
Portugal	1	6	5	7	6	15,683	No (Yes)	3,360
Spain	3	5	6	4	5	22,968	No (No)	3,580
Sweden	1	3	4	7	5	37,450	No (Yes)	3,910
Switzerland	4	0	5	4	3	51,570	No (Yes)	3,920
U.K.	24	10	7	7	8	35,325	No (Yes)	3,440
	Regional mean	***5.9***	***4.7***	***6.1***	***5.6***	***34,055***		***3,575***
Latin America								
Argentina	8	6	2	6	4.7	4,215	No (No)	5,300
Brazil	6	6	7	3	5.3	3,715	No (No)	4,760
Mexico	13	7	2.5	5	4.9	7,108	No (Yes)	2,090
	Regional mean	***6.3***	***3.8***	***4.7***	***5.0***	***5,013***		***3,634***
Middle East/Africa								
Israel	5	7	9	9	8.3	18,648	No (No)	5,660
South Africa	4	8	8	8	8	4,175	No (Yes)	7,970
	Regional mean	***7.5***	***8.5***	***8.5***	***8.2***	***11,412***		***6,686***
United States	-	7	9	9	8.3	41580	No (Yes)	-

As expected, the developed regions have on average larger firm sizes, almost triple those of the firms in the emerging Asian markets and about five times as much as the Latin American and Middle East/African firms. Latin American firms have more concentrated ownerships, on average over 60% of the company shares are held by insiders whereas less than 30% insider ownership is found in the firms in all the other regions. On the other hand, Table 1.3 seems to suggest that institutional investors have more interest in investing in Latin American (hold, on average, 28.2% of the firms) and Middle East/African firms (hold, on average, 22.1% of the firms). ADRs are on average subject to less noise trader risk than their underlying stocks in all regions. The greatest differences exist in the Latin American and Middle East/African firms. The underlying stocks in developed regions have a relatively higher degree of comovements with their home market index performance, in other words, less idiosyncratic risk; this contradict Morck, Yeung and Yu (2000) finding that emerging markets have greater R^2. Comparing the trading of ADRs and their underlying stocks, ADR trading tends to be greater in the emerging Asian markets. This could suggest that investors are much interested in the emerging Asian markets but might not have easy access to these markets or not having enough confidence in the country regulations of this region with respect to investments. As such, the only alternative left to the investors is investing in the ADRs of these countries.

Table 1.3 Some Statistics About the ADR-Underlying Stock Pairs

This table reports the company characteristics of the ADR-underlying stock pairs. The countries are grouped under 5 regions. Firm market capitalization is obtained from Compustat. Insider ownership and institutional ownership are downloaded from the MSN Money website. Noise trader risk is estimated as the standard deviation of the international market model's residuals. R^2 is the adjusted R^2 of the regression of the underlying stock's returns on the corresponding home market returns. % trading in ADR is estimated as the fraction of the aggregate trading revenues in ADRs over the sample period.

Country	Number of ADR-UDL Pairs	Mean Market Capitalization of Issuing Firms (US$ Millions)	Mean % of Insider Ownership	Mean % of Institutional Ownership	Mean Noise Trader Risk in ADR	Mean Noise Trader Risk in UDL	Mean R^2	Mean % Trading in ADR
Asia Develop								
Australia	7	12,356	6.6	3.7	.020	.020	.267	9.0
Hong Kong	14	10,993	52.0	6.3	.026	.027	.307	24.3
Japan	17	32,998	16.4	5.1	.016	.019	.365	75.8
	38	***21,089***	***27.7***	***5.3***	***.021***	***.022***	***.325***	***44.5***
Asia Emerging								
India	5	6,941	19.0	15.1	.023	.034	.163	96.3
Indonesia	1	2,416	55.0	2.65	.021	.052	.039	97.7
South Korea	6	13,177	20.0	15.0	.025	.021	.303	81.9
	12	***9,682***	***22.5***	***14.0***	***.024***	***.029***	***.225***	***89.1***
Europe Develop								
Belgium	1	5,413	1.0	1.8	.019	.018	.256	91.7
Finland	1	77,570	1.0	19.8	.017	.019	.843	98.1
France	8	30,759	26.6	6.0	.016	.017	.378	41.9
Germany	3	49,000	4.7	7.5	.014	.015	.459	97.9
Greece	1	8,723	51.0	.5	.021	.017	.015	74.4
Ireland	6	7,520	6.4	37.3	.028	.031	.229	96.5
Italy	2	52,242	52.5	3.2	.011	.013	.360	10.7

Table 1.3 (cont.)

Country	Number of ADR-UDL Pairs	Mean Market Capitalization of Issuing Firms (US$ Millions)	Mean % of Insider Ownership	Mean % of Institutional Ownership	Mean Noise Trader Risk in ADR	Mean Noise Trader Risk in UDL	Mean R^2	Mean % Trading in ADR
Netherlands	2	14,507	23.0	2.6	.020	.021	.174	50.2
Norway	2	20,123	36.0	9.3	.026	.027	.448	89.7
Portugal	1	12,359	27.0	4.2	.014	.013	.122	77.4
Spain	3	50,722	14.3	1.7	.011	.013	.523	2.8
Sweden	1	41,119	1.0	7.4	.022	.024	.453	94.9
Switzerland	4	49,036	4.5	7.7	.015	.015	.430	10.3
U.K.	24	43,296	2.2	9.6	.014	.015	.328	1.1
	59	***36,348***	***11.6***	***10.6***	***.016***	***.018***	***.349***	***34.2***
Latin America								
Argentina	8	3,362	72.3	15.0	.026	.040	.157	7.9
Brazil	6	3,367	54.1	37.9	.026	.032	.227	38.8
Mexico	13	5,466	65.2	31.8	.021	.051	.208	72.6
	27	***4,376***	***64.8***	***28.2***	***.023***	***.044***	***.198***	***45.9***
Middle East/Africa								
Israel	5	4,517	33.0	23.6	.025	.041	.171	2.8
South Africa	4	9,392	20.8	20.4	.024	.051	.048	50.0
	9	***6,684***	***27.6***	***22.1***	***.024***	***.045***	***.117***	***23.8***

1.7 Empirical Results and Discussions

Although not reported here, Engle's LM Test for the presence of autoregressive conditional heteroskedasticity shows that the daily close-to-close returns of all the ADRs and their underlying stocks in the sample have ARCH effects up to 12 lags. This justifies the use of a GARCH model to analyze the return and volatility transfers. From Table 1.4, it can be seen that the ADRs and their underlying stocks in the sample on average have a small serial correlation thus it is appropriate to include MA(1) in the conditional return of the GARCH-in-mean model [Hamao, Masulis and Ng (1990)].

ADRs on average have a higher mean daily return than that of their underlying stocks. In particular, emerging Asian ADRs' mean daily return is considerably higher than that of their underlying stocks. Regarding standard deviation of returns, the Asian (both developed and emerging) and European subsamples are about the same between home and ADR shares. On the other hand, the underlying stocks are on average about 70% and 260% more volatile than their ADRs in the Latin American and Middle East/African subsamples respectively. These results seem to suggest that pricing differ across markets, even for the same underlying firms.

Table 1.4 Summary Statistics of the Daily Return Distribution of the ADRs and Underlying Stock Pairs

This table shows the mean, standard deviation and the serial correlation of the daily returns estimated from the prices downed from Yahoo Finance and Reuters Data Link.

		Mean (%)		Std. Dev. (%)		Serial Correlation	
Country		ADR	Underlying Stock	ADR	Underlying Stock	ADR	Underlying Stock
Asia Develop							
Australia	7	.08	.04	2.24	2.03	-.027	-.033
Hong Kong	14	.15	.14	2.83	2.75	-.054	.020
Japan	17	.06	.05	1.84	1.95	-.016	.006
	38	***.09***	***.08***	***2.28***	***2.39***	***-.032***	***.004***
Asia Emerging							
India	5	.13	.02	2.55	3.42	-.016	.010
Indonesia	1	.14	.006	2.33	5.21	.006	-.042
South Korea	6	.05	.04	2.72	2.13	-.043	.010
	12	***.09***	***.02***	***2.61***	***2.85***	***-.023***	***.006***
Europe Develop							
Belgium	1	.14	.11	2.00	1.91	-.028	.022
Finland	1	.08	.05	2.09	2.08	.018	.026
France	8	.08	.05	1.92	1.87	-.028	.024
Germany	3	.07	.04	1.85	1.77	-.023	.023
Greece	1	.11	.08	2.18	1.71	-.188	.025
Ireland	6	.08	.04	2.91	3.20	.006	-.015
Italy	2	.08	.05	1.35	1.41	-.089	-.105
Netherlands	2	.20	.17	2.21	2.17	-.027	.003
Norway	2	.18	.15	2.80	2.72	-.009	-.026
Portugal	1	.08	.03	1.45	1.31	-.112	-.032
Spain	3	.09	.09	1.45	1.46	-.066	.012

Table 1.4 Cont.

Country		Mean (%)		Std. Dev. (%)		Serial Correlation	
		ADR	Underlying Stock	ADR	Underlying Stock	ADR	Underlying Stock
Sweden	1	.11	.08	2.67	2.66	.084	.056
Switzerland	4	.11	.09	1.75	1.72	-.051	-.003
U.K.	24	.08	.05	1.64	1.60	-.066	-.044
	59	***.09***	***.06***	***1.90***	***1.90***	***-.046***	***-.017***
Latin America							
Argentina	8	.12	.11	2.69	4.02	.025	-.077
Brazil	6	.16	.13	2.84	3.24	.014	.014
Mexico	15	.11	.10	2.27	5.23	.046	-.089
	27	***.12***	***.11***	***2.52***	***4.29***	***.032***	***-.062***
Middle East/Africa							
Israel	5	.09	.05	2.39	12.12	-.043	-.173
South Africa	4	.03	.01	2.58	5.07	-.026	-.323
	9	***.07***	***.03***	***2.47***	***8.98***	***-.035***	***-.240***

The results of the regression analysis are presented in Table 1.5 to Table 1.8. Model 1 presents the full regression model. Since short sell is highly correlated with Ln(PCGNI) and noise trader risk is also highly correlated with synchronicity (See Appendix Table A1.1), these variables are not included in the same regression -- Models 2 and 3 present these analyses.

For the return transfer from ADRs to their underlying stocks (Table 1.5 Models 2 and 3), the coefficient of market development is significantly positive. It makes sense because with better market development, investors encounter fewer restrictions. As a result, information can be transmitted more easily between markets through their trading. This strongly supports Hypothesis 1.

The coefficient of disclosure is significantly positive. Greater disclosure requirement makes firms report their operation results and material facts in a more accurate and timely manner. This will likely remove some of the uncertainties that the investors might have. Consequently, they are more willing to trade in the markets with higher disclosure requirement than those with lower disclosure requirement, thus leading to more efficient return transfers from the ADR market to their underlying stock market. The coefficient of director liability is not significant. On the other hand, the coefficient of shareholder suit is significantly negative. This is inconsistent with the prediction of Hypothesis 2. The joint results in the investor protection partially support Hypothesis 2.

Table 1.5 Regression of Return Transfer Effect from ADRs to Underlying Stocks on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks

β_1 is obtained from the following MA(1)-GARCH(1,1) –M model:

$$R_{i,t}^{UDL} = \beta_0 + \beta_1 R_{i,t}^{ADR} + \beta_2 h_{i,t}^{UDL} + \beta_3 \varepsilon_{i,t-1}^{UDL} + \varepsilon_{i,t}^{UDL}, \qquad \varepsilon_{i,t}^{UDL} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{UDL}\right),$$

$$h_{i,t}^{UDL} = \exp(b_0 + b_1\left(\varepsilon_{i,t}^{ADR}\right)^2) + b_2\left(\varepsilon_{i,t-1}^{UDL}\right)^2 + b_3 h_{t-1}^{UDL}$$

Dependent Variable	**Model 1** Return Transfer from ADR to Underlying Stock β_1		**Model 2** Return Transfer from ADR to Underlying Stock β_1		**Model 3** Return Transfer from ADR to Underlying Stock β_1	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
Independent Variables						
Market Development (Ln(PCGNI))	.054***	0.00	.06***	0.00	.06***	0.00
Short Sell	-.01	0.86				
Distance (Miles)	-3.84e-09	1.00				
Disclosure	.01*	0.08	.01*	0.06	.01*	0.06
Director Liability	.01	0.11	.01	0.11	.01	0.14
Shareholder Suit	-.02*	0.08	-.02**	0.04	-.02**	0.04
Insider Ownership	.001**	0.04	.001**	0.03	.001*	0.08
Institutional Ownership	.0004	0.62	.0003	0.66	.001	0.43
Noise Trader Risk	-2.62***	0.01	-3.02***	0.00		
Synchronicity (R^2)	.11	0.20			.17**	0.03
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	.48***	0.01	.47***	0.00	.44***	0.01
$(\%\sigma^{ADR})^2$	-.46***	0.02	-.46***	0.01	-.44***	0.01
Market Liquidity (Ln(MCAP))	.004	0.66	.01	0.30	.01	0.33
Constant	.14	0.48	.14	0.40	.003	0.98
Obs	145		145		145	
Adj. R^2	0.26		0.27		0.24	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

The coefficient of insider ownership is significantly positive whereas the coefficient of institutional ownership is not significant. These results do not lend any support to Hypothesis 3 which predicts that the higher the insider ownership, the lower the return transfers.

The coefficient of noise trader risk is significantly negative. As expected, if the investors are short-term traders, they would be less willing to trade in stocks with high noise trader risk. The lack of trading, in turn, lowers the return and volatility transfers between the ADRs and their underlying stocks. This finding strongly supports the prediction of Hypothesis 4. That is, if the investors are mainly short-term traders, they would be hesitated to trade in stocks with great noise trader risk. The coefficient of synchronicity is significantly positive. This finding is consistent with Hypothesis 5.

The coefficient of proportion of trading in U.S. is significantly positive. But the coefficient of market liquidity is not significant. Thus, the importance of liquidity is not conclusive. In addition, the square of proportion of U.S. trading is negative, suggesting that the relation between transfer and U.S. trading weakens as the latter gets larger.

For the return transfer from the underlying stocks to the ADRs, the results are shown in Table 1.6, Model 2 and Model 3. Similar to the return transfer from the ADRs to their underlying stocks, the coefficient of shareholder suit is significantly negative. Again this is not consistent with Hypothesis 2. Consistent with earlier results, the coefficient of noise trader risk is significantly negative while that of synchronicity is significantly positive. Again, the coefficient of proportion of trading in U.S. is significantly positive but the coefficient of market liquidity is not significant.

Table 1.6 Regression of Return Transfer Effect from Underlying Stocks to ADRs on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks

α_1 is obtained from the following MA(1)-GARCH(1,1)–M model:

$$R_{i,t}^{ADR} = \alpha_0 + \alpha_1 R_{i,t}^{UDL} + \alpha_2 h_{i,t}^{ADR} + \alpha_3 \varepsilon_{i,t-1}^{ADR} + \varepsilon_{i,t}^{ADR}, \qquad \varepsilon_{i,t}^{ADR} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{ADR}\right),$$

$$h_{i,t}^{ADR} = \exp(a_0 + a_1 \left(\varepsilon_{i,t}^{UDL}\right)^2) + a_2 \left(\varepsilon_{i,t-1}^{ADR}\right)^2 + a_3 h_{t-1}^{ADR}$$

Dependent Variable	**Model 1** Return Transfer from Underlying Stock to ADR α_1		**Model 2** Return Transfer from Underlying Stock to ADR α_1		**Model 3** Return Transfer from Underlying Stock to ADR α_1	
Independent Variables	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
Market Development (Ln(PCGNI))	.02	0.33	.02	0.22	.02	0.20
Short Sell	.003	0.95				
Distance (Miles)	7.01e-06	0.40				
Disclosure	.01	0.22	.01	0.24	.01	0.25
Director Liability	.00001	1.00	-.001	0.86	-.001	0.85
Shareholder Suit	-.03**	0.03	-.03**	0.04	-.02**	0.05
Insider Ownership	-.0002	0.71	-.0003	0.64	-.0005	0.43
Institutional Ownership	.0002	0.85	-.0002	0.81	.0004	0.70
Noise Trader Risk	-3.24***	0.01	-4.40***	0.00		
Synchronicity (R^2)	.33***	0.00			.39***	0.00
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	.39*	0.07	.48***	0.01	.41**	0.03
$(\%\sigma^{ADR})^2$	-.45**	0.04	-.54***	0.01	-.49**	0.01
Market Liquidity (Ln(MCAP))	-.01	0.42	.01	0.60	-.002	0.89
Constant	.74***	0.00	.75***	0.00	.59***	0.00
Obs	142		142		142	
Adj. R^2	0.27		0.22		0.24	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

For the volatility transfer from the ADRs to their underlying stocks (Table 1.7 Model 2 and Model 3), the coefficient of disclosure is significantly positive whereas the coefficient of shareholder suit is significantly negative. These findings again provide mixed support to Hypothesis 2. The coefficient of institutional ownership is significantly negative, which does not support Hypothesis 3. The coefficient of noise trader risk is significantly negative and the coefficient of synchronicity is significantly positive. These two results support Hypotheses 4 and 5 respectively. The significantly negative coefficient of market liquidity is contrary to our hypothesis. However, the market liquidity here is measured by firm size; if larger firms tend to have the majority of informed traders domiciled in the home market, then the effect of ADR on home shares is likely small.

With regard to the volatility transfer from the underlying stocks to the ADRs (Table 1.8 Model 2 and Model 3), the coefficient of director liability is significantly negative while the other investor protection measures are not significant. These are contrary to Hypothesis 2. The coefficient of noise trader risk is significantly negative and the coefficient of synchronicity is significantly positive, which support both Hypotheses 4 and 5. The coefficient of market liquidity is significantly positive. This supports Hypothesis 6.

Table 1.7 Regression of Volatility Transfer Effect from ADRs to Underlying Stocks on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks

b_1 is obtained from the following MA(1)-GARCH(1,1)–M model:

$$R^{UDL}_{i,t} = \beta_0 + \beta_1 R^{ADR}_{i,t} + \beta_2 h^{UDL}_{i,t} + \beta_3 \varepsilon^{UDL}_{i,t-1} + \varepsilon^{UDL}_{i,t}, \qquad \varepsilon^{UDL}_{i,t} \mid \Omega_{t-1} \sim N\left(0, h^{UDL}_{i,t}\right),$$

$$h^{UDL}_{i,t} = \exp(b_0 + b_1\left(\varepsilon^{ADR}_{i,t}\right)^2) + b_2\left(\varepsilon^{UDL}_{i,t-1}\right)^2 + b_3 h^{UDL}_{t-1}$$

	Model 1 Volatility Transfer ADR to Underlying Stock		**Model 2** Volatility Transfer ADR to Underlying Stock		**Model 3** Volatility Transfer ADR to Underlying Stock	
Dependent Variable	b_1		b_1		b_1	
Independent Variables	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
Market Development (Ln(PCGNI))	-50422	0.19	7295	0.82	11819	0.71
Short Sell	215231***	0.01				
Distance (Miles)	8	0.54				
Disclosure	6329	0.60	19328*	0.09	19714*	0.09
Director Liability	2398	0.83	-172	0.99	-2006	0.86
Shareholder Suit	-40642**	0.06	-41911**	0.03	-41806**	0.03
Insider Ownership	373	0.70	87	0.93	-323	0.74
Institutional Ownership	-3870***	0.01	-4810***	0.00	-4372***	0.01
Noise Trader Risk	-4886893***	0.01	-5278981***	0.00		
Synchronicity (R^2)	270877*	0.08			313489**	0.04
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	-374172	0.27	65266	0.83	24462	0.94
$(\%\sigma^{ADR})^2$	511377	0.14	88497	0.77	105081	0.74
Market Liquidity (Ln(MCAP))	-55740***	0.00	-42143***	0.01	-43438***	0.01
Constant	1033789***	0.01	535828	0.12	313214	0.35
Obs	133		133		133	
Adj. R^2	0.16		0.12		0.08	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 1.8 Regression of Volatility Transfer Effect from Underlying Stocks to ADRs on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks

a_1 is obtained from the following MA(1)-GARCH(1,1)–M model:

$$R_{i,t}^{ADR} = \alpha_0 + \alpha_1 R_{i,t}^{UDL} + \alpha_2 h_{i,t}^{ADR} + \alpha_3 \varepsilon_{i,t-1}^{ADR} + \varepsilon_{i,t}^{ADR}, \qquad \varepsilon_{i,t}^{ADR} \mid \Omega_{t-1} \sim N(0, h_{i,t}^{ADR}),$$

$$h_{i,t}^{ADR} = \exp(a_0 + a_1 (\varepsilon_{i,t}^{UDL})^2) + a_2 (\varepsilon_{i,t-1}^{ADR})^2 + a_3 h_{t-1}^{ADR}$$

Dependent Variable	**Model 1** Volatility Transfer from Underlying Stock to ADR a_1		**Model 2** Volatility Transfer from Underlying Stock to ADR a_1		**Model 3** Volatility Transfer from Underlying Stock to ADR a_1	
Independent Variables	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
Market Development (Ln(PCGNI))	16	0.71	25	0.45	25	0.44
Short Sell	20	0.85				
Distance (Miles)	.01	0.74				
Disclosure	9	0.52	9	0.52	9	0.49
Director Liability	-23*	0.08	-24*	0.07	-26*	0.06
Shareholder Suit	2	0.93	4	0.85	9	0.70
Insider Ownership	.24	0.82	.30	0.78	-.12	0.91
Institutional Ownership	1	0.55	.50	0.78	1.73	0.32
Noise Trader Risk	-4920**	0.03	-6282***	0.00		
Synchronicity (R^2)	390**	0.05			514***	0.01
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	-314	0.46	-203	0.57	-309	0.38
$(\%\sigma^{ADR})^2$	191	0.66	74	0.84	161	0.66
Market Liquidity (Ln(MCAP))	53**	0.02	69***	0.00	65***	0.00
Constant	-243	0.61	-290	0.44	-572*	0.10
Obs	127		127		127	
Adj. R^2	0.32		0.31		0.30	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Given that some of the above findings are mixed and that some previous studies document that ADR returns are affected by the U.S. equity market, home equity market and home currency returns (Jiang (1998), Choi and Kim (2000), Patro (2000), Kim, Szakmary and Mathur (2002), Kutan and Zhou (2006)), a further analysis is performed. This added analysis of the return and volatility transfers controls in both the conditional return and conditional variance of the GARCH model for the aforementioned market returns as in the following.

$$R_{i,t}^{ADR} = \alpha_0 + \alpha_1 R_{i,t}^{UDL} + \alpha_2 R_{US,t} + \alpha_3 R_{H,t} + \alpha_4 R_{FX,t} + \alpha_5 h_{i,t}^{ADR} + \alpha_6 \varepsilon_{i,t-1}^{ADR} + \varepsilon_{i,t}^{ADR},$$

$$\varepsilon_{i,t}^{ADR} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{ADR}\right),$$

$$h_{i,t}^{ADR} = \exp(a_0 + a_1\left(\varepsilon_{i,t}^{UDL}\right)^2 + a_2 R_{US,t} + a_3 R_{H,t} + a_4 R_{FX,t}) + a_5\left(\varepsilon_{i,t-1}^{ADR}\right)^2 + a_6 h_{t-1}^{ADR}$$

-----------------------(5)

$$R_{i,t}^{UDL} = \beta_0 + \beta_1 R_{i,t}^{ADR} + \beta_2 R_{US,t} + \beta_3 R_{H,t} + \beta_4 R_{FX,t} + \beta_5 h_{i,t}^{UDL} + \beta_6 \varepsilon_{i,t-1}^{UDL} + \varepsilon_{i,t}^{UDL},$$

$$\varepsilon_{i,t}^{UDL} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{UDL}\right),$$

$$h_{i,t}^{UDL} = \exp(b_0 + b_1\left(\varepsilon_{i,t}^{ADR}\right)^2 + b_2 R_{US,t} + b_3 R_{H,t} + b_4 R_{FX,t}) + b_5\left(\varepsilon_{i,t-1}^{UDL}\right)^2 + b_6 h_{t-1}^{UDL}$$

-----------------------(6)

where $R_{US,t}$, $R_{H,t}$ and $R_{FX,t}$ are the daily returns of U.S. equity market, home equity market and home currency respectively from day t-1 to day t.

In short, the estimation here extends the baseline model by including the impacts of the three related markets: U.S. equity market, home equity market, and home currency returns on the return and volatility transfers.

This model's regression results of the return transfer effects are shown in Table 1.9. The coefficient of market development is significantly positive in the bi-directional return transfer between the ADRs and their underlying stocks. This finding gives some very strong support to Hypothesis 1. For the country investor protection variables, only the coefficient of disclosure is significantly positive in the return transfer from the ADRs to their underlying stocks. On the other hand, the coefficient of shareholder suit remains significant in the return transfers in both directions, and it is not in the expected direction. It is possible that there are substantial measurement problems regarding the effectiveness of shareholder suits. Alternatively, this variable is correlated with disclosure and director liability, suggesting that its sign might not be entirely reliable. The coefficients of insider ownership and institutional ownership are no longer significant in the return transfer in either direction. Therefore, taken together, variables related to corporate governance are partially consistent with corporate governance being important though less than robust. One possible explanation for this is that the effects of corporate governance tend to be long term. Return and volatility transfers, on the other hand, are relatively short-term events. If so, it is not too surprising that the relations between transfer and corporate governance are not strong. Turning to the more market-based variables, the results are largely the same as those using the baseline model. Specifically, noise trader risk is only significantly negative in the return transfer from the underlying stocks to the ADRs, the coefficient of synchronicity remains significantly positive in the return transfer from the underlying stocks to the ADRs but turns to significantly negative from ADRs to their underlying stocks. The coefficients of the proportion of trading in U.S. is significantly positive in the return transfer from ADRs to their underlying stocks.

Table 1.9 Regression of Return Transfer Effect between ADRs and Underlying Stocks on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks after Controlling for U.S. Equity Market Return, Home Equity Market Return and Home Currency Return

$\alpha_1, a_1, \beta_1, b_1$ are obtained from the following MA(1)-GARCH(1,1)–M models:

$$R^{ADR}_{i,t} = \alpha_0 + \alpha_1 R^{UDL}_{i,t} + \alpha_2 R_{US,t} + \alpha_3 R_{H,t} + \alpha_4 R_{FX,t} + \alpha_5 h^{ADR}_{i,t} + \alpha_6 \varepsilon^{ADR}_{i,t-1} + \varepsilon^{ADR}_{i,t}, \quad \varepsilon^{ADR}_{i,t} | \Omega_{t-1} \sim N(0, h^{ADR}_{i,t}), \quad h^{ADR}_{i,t} = \exp(a_0 + a_1 (\varepsilon^{UDL}_{i,t})^2 + a_2 R_{US,t} + a_3 R_{H,t} + a_4 R_{FX,t}) + a_5 (\varepsilon^{ADR}_{i,t-1})^2 + a_6 h^{ADR}_{t-1}$$

$$R^{UDL}_{i,t} = \beta_0 + \beta_1 R^{ADR}_{i,t} + \beta_2 R_{US,t} + \beta_3 R_{H,t} + \beta_4 R_{FX,t} + \beta_5 h^{UDL}_{i,t} + \beta_6 \varepsilon^{UDL}_{i,t-1} + \varepsilon^{UDL}_{i,t}, \quad \varepsilon^{UDL}_{i,t} | \Omega_{t-1} \sim N(0, h^{UDL}_{i,t}), \quad h^{UDL}_{i,t} = \exp(b_0 + b_1 (\varepsilon^{ADR}_{i,t})^2 + b_2 R_{US,t} + b_3 R_{H,t} + b_4 R_{FX,t}) + b_5 (\varepsilon^{UDL}_{i,t-1})^2 + b_6 h^{UDL}_{t-1}$$

	From ADR to Underlying Stock				From Underlying Stock to ADR			
	Return Transfer		Return Transfer		Return Transfer		Return Transfer	
Dependent Variable	β_1		β_1		α_1		α_1	
Independent Variables								
Market Development (Ln(PCGNI))	.05***	0.00	.06***	0.00	.05***	0.01	.05***	0.01
Short Sell								
Distance (Miles)								
Disclosure	.02***	0.01	.02***	0.01	.005	0.55	.01	0.52
Director Liability	.01	0.23	.01	0.29	.001	0.86	.001	0.85
Shareholder Suit	-.05***	0.00	-.05***	0.00	-.03**	0.02	-.03**	0.03
Insider Ownership	-.0002	0.67	-.0003	0.53	-.0004	0.49	-.001	0.35
Institutional Ownership	.001	0.14	.001	0.15	-.001	0.48	-.0002	0.80
Noise Trader Risk	-.61	0.55			-3.97***	0.00		
Synchronicity (R^2)			-.29***	0.00			.39***	0.00
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	.61***	0.00	.64***	0.00	.34*	0.10	.28	0.17
$(\%\sigma^{ADR})^2$	-.65***	0.00	-.68***	0.00	-.41*	0.06	-.36*	0.09
Market Liquidity (Ln(MCAP))	.02**	0.04	.04***	0.00	.01	0.61	-.003	0.76
Constant	.28	0.14	.11	0.52	.51**	0.03	.388*	0.06
Obs	144		144		144		144	
Adj. R^2	0.27		0.34		0.25		0.28	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 1.10 presents the results of the volatility transfer between the ADRs and their underlying stocks after controlling for the market returns. The coefficient of market development is significantly positive in the volatility transfer from the ADRs to their underlying stocks. The coefficient of disclosure is significantly positive in the volatility transfer from the underlying stocks to the ADRs. The coefficient of the shareholder suit is significantly negative from the ADRs to their underlying stocks. The coefficient of institutional ownership is significantly negative from the ADRs to their underlying stocks. The coefficient of the noise trader risk is significantly negative from the direction of ADRs to underlying stocks. The coefficient of synchronicity is significantly positive between them. The coefficient of market liquidity is significantly negative in the volatility transfer from the ADRs to their underlying stocks. In sum, these conclusions remain largely the same, with or without controlling for market returns.

Table 1.10 Regression of Volatility Transfer Effect between ADRs and Underlying Stocks on Market Development, Investment Restrictions, Investor Protection, Ownership Structure, Noise Trader Risk, Synchronicity, Proportion of Trading in U.S. and Market Liquidity of the Issuing Firm's Stocks after Controlling for U.S. Equity Market Return, Home Equity Market Return and Home Currency Return

α_1, a_1, β_1, b_1 are obtained from the following MA(1)-GARCH(1,1)–M models:

$$R_{i,t}^{ADR} = \alpha_0 + \alpha_1 R_{i,t}^{UDL} + \alpha_2 R_{US,t} + \alpha_3 R_{H,t} + \alpha_4 R_{FX,t} + \alpha_5 h_{i,t}^{ADR} + \alpha_6 \varepsilon_{i,t-1}^{ADR} + \varepsilon_{i,t}^{ADR}, \quad \varepsilon_{i,t}^{ADR} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{ADR}\right), \; h_{i,t}^{ADR} = \exp(a_0 + a_1\left(\varepsilon_{i,t}^{UDL}\right)^2 + a_2 R_{US,t} + a_3 R_{H,t} + a_4 R_{FX,t}) + a_5\left(\varepsilon_{i,t-1}^{ADR}\right)^2 + a_6 h_{t-1}^{ADR}$$

$$R_{i,t}^{UDL} = \beta_0 + \beta_1 R_{i,t}^{ADR} + \beta_2 R_{US,t} + \beta_3 R_{H,t} + \beta_4 R_{FX,t} + \beta_5 h_{i,t}^{UDL} + \beta_6 \varepsilon_{i,t-1}^{UDL} + \varepsilon_{i,t}^{UDL}, \; \varepsilon_{i,t}^{UDL} \mid \Omega_{t-1} \sim N\left(0, h_{i,t}^{UDL}\right), h_{i,t}^{UDL} = \exp(b_0 + b_1\left(\varepsilon_{i,t}^{ADR}\right)^2 + b_2 R_{US,t} + b_3 R_{H,t} + b_4 R_{FX,t}) + b_5\left(\varepsilon_{i,t-1}^{UDL}\right)^2 + b_6 h_{t-1}^{UDL}$$

	From ADR to Underlying Stock				From Underlying Stock to ADR			
	Volatility Transfer		Volatility Transfer		Volatility Transfer		Volatility Transfer	
Dependent Variable	b_1		b_2		a_1		a_1	
Independent Variables								
Market Development (Ln(PCGNI))	1141*	0.06	1243**	0.04	-940	0.43	-1395	0.23
Short Sell								
Distance (Miles)								
Disclosure	415	0.13	422	0.13	1240***	0.01	1245***	0.01
Director Liability	211	0.41	162	0.53	17	0.97	127	0.79
Shareholder Suit	-1066**	0.02	-979**	0.03	-66	0.94	-22	0.98
Insider Ownership	-15	0.43	-23	0.25	-22	0.57	-15	0.69
Institutional Ownership	-66**	0.05	-53*	0.10	57	0.36	48	0.42
Noise Trader Risk	-134318***	0.00			38357	0.61		
Synchronicity (R^2)			10976***	0.00			14812**	0.02
Proportion of Trading in U.S. $(\%\sigma^{ADR})$	1205	0.85	-603	0.92	-11871	0.34	-12394	0.31
$(\%\sigma^{ADR})^2$	2784	0.66	4105	0.52	9495	0.46	10849	0.39
Market Liquidity (Ln(MCAP))	-1022***	0.00	-1174***	0.00	285	0.68	-6689	0.35
Constant	3506	0.60	-2472	0.70	-2400	0.86	5867	0.63
Obs	128		128		119		119	
Adj. R^2	0.12		0.11		0.02		0.07	

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

1.8 Conclusions

This paper examines return and volatility transfers between ADRs and their underlying stocks using 145 ADR-underlying stock pairs issued by firms in 25 countries trading during the period from January 2003 through December 2007. Our investigation differs from previous studies in that we cover substantially more countries and that we attempt to explain the variations of the extents of transfer effects across stocks and countries. Various hypotheses are developed, based on the premise that barriers associated with trading, investments, and corporate governance would lower the extent of transfers.

Our primary results are described as follows. After controlling for U.S. equity market, home equity market and home currency returns, the extent of market developments increases the bi-directional return transfers and the unidirectional volatility transfers from the ADRs to their underlying stocks. Disclosure requirement increases the return transfer from the ADRs to their underlying stocks and the volatility transfer in the opposite direction. Shareholders' ability to sue officers and directors for misconduct lowers the return transfer in both directions and the volatility transfer from the ADRs to their underlying stocks. These results are contrary to our Hypothesis 2. One possible reason for this may be measurement problems. For example, Morck, Shleifer and Vishny (1988) find that the relation between managerial ownership and firm value is non-linear. Further, insider ownership might vary considerably across countries. Institutional ownership lowers the volatility transfer from the ADRs to their underlying stocks. Noise trader risk lowers the return transfer from the underlying stock to the ADRs and the volatility transfer from the ADRs to their underlying stocks. Synchronicity lowers the return transfer from the ADRs to their underlying stocks but increases it in the opposite direction. On the other hand, it increases the bi-directional volatility transfers. Proportion of trading in the U.S. increases the return transfer from the ADRs to their underlying stocks. Market liquidity increases the return transfer but lowers the volatility transfer from the ADRs to their underlying stocks. In summary, most results are in agreement with our hypotheses, and the general findings indicate that these barriers have an effect on the magnitude of return and volatility transfer effects. Further theoretical development might help to explain some inconsistencies here, particularly on volatility transfer. Compared to return transfer, the transmission of volatility is more likely to be complicated with factors that we do not incorporate.

CHAPTER 2
ADR MARKET TIMING: IN WHICH MARKET DO ISSUERS POSSESS BETTER MARKET-TIMING ABILITY AND WHAT IS THE ROLE OF REGULATIONS?

2.1 Abstract

An ADR issue's proceeds might depend on the conditions of three markets: its home equity market, U.S. equity market, or currency market. From purely the standpoint of information accessibility, ADR issuers are likely to time their issues with respect to the conditions of home equity market and/or currency market. However, regulations and other market imperfections might make timing these two markets difficult. This essay empirically examines the relative market timing ability of ADR issuers in these three markets. Using a sample of 134 capital raising ADR issues from 16 countries during the period from January 1998 through December 2006, we find that high beta SEO ADR issuers seem to time the U.S. equity market; the same is also true in tightly regulated countries. Although the evidence is not overwhelming, the findings suggest the existence of market-timing ability, and that regulations and market imperfections can affect timing ability.

2.2 Introduction

Previous research indicates that market timing appears to occur in security issuance. This is partially consistent with theories such as Myers and Majulf (1984) in which managers care about existing shareholders more than new investors. As a result they have incentives to sell equity at market upswings.

This study attempts to extend timing studies in two ways. First, we examine whether timing ability exists in the issuance of American Depository Receipts (ADRs). While there is abundance of literature on security offers, few examine whether timing effects are present in the ADR issuances. Investigating timing effects of ADRs has the potential to further explore the importance of information asymmetry in security issuance. If the world market is integrated in terms of information accessibility, then we would expect timing effects of ADRs to be similar to those of the U.S. If information is incomplete or costly, then timing ability would be weakened. Moreover, an ADR issuer should be concerned with three markets when choosing an appropriate issuance time, namely the home equity market, the U.S. equity market, and the currency market. Under information asymmetry and assuming that firms have more information about their home environment, they are more likely to have the ability to time home equity and/or currency markets, but not the U.S. market. That is, the results here should have implications for the role of information accessibility in selling stocks. The literature on the timing of ADRs is sparse; to our knowledge only Pasquariello, Yuan and Zhu (2006) directly look into this issue. However, their analysis utilizes only country-level data, specifically the number of ADR issues from a country. This number seems to be a crude measure of timing effects and it is plausible that this number can be influenced by factors other than information availability. These factors would include regulations, market liquidity, tax, and others. In contrast, this study utilizes firm-level data, thus allows a richer set of testing. Additionally, since their focus is on the currency market, they exclude countries that have relatively fixed currency value. One country excluded in their study is China, which has high representation in the ADR market in recent years. The analysis here includes these countries.

A secondary purpose of this study is to examine the relevance of regulation in market timing. If regulatory restrictions do not allow firms to fully utilize their information, they are less likely to be able to time the market(s). To assess the role of regulations, we compare results between tightly-regulated and loosely-regulated countries, and before and after the passage of the Sarbanes-Oxley Act (SOX) of 2002. The SOX requires, among other things, that an independent board oversees auditors of public companies, and that CEOs and CFOs be personally responsible for the accuracy of their firm's financial reports. We expect that the tighter the regulation(s) faced by the ADR issuers, the more difficulty they might have in their market timing activities. With this reasoning, weaker market timing activities by ADR issuers are expected in tightly-regulated countries and also after the passage of SOX.

Previous research indicates that the major reasons for ADR issuance include lower cost of capital, higher liquidity, obtaining medium of exchange in merger and acquisition transactions, and acquisition of needed foreign currency[5]. It should be pointed out that this study does not attempt to provide more insights on the motivations of ADR issuance; rather, we take as given that ADR issuance has some benefits. Our focus is that, given the benefits and the decisions of selling ADRs, do issuers demonstrate timing ability and, if so, in which market do they tend to process timing ability.[6]

Because the focus here is on issue timing, the sample firms here include all ADRs that involve capital-raising, regardless of whether an issue has been previously sold in the U.S. However, there are a non-trivial number of firms, particularly from China, that sell ADRs without any prior trading history, not even in their home countries; that is, these firms are truly conducting "initial" public offers. Because these companies are selling stocks to the public for the first time, pricing uncertainty is likely high and a large part of this uncertainty is likely

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[5] Comprehensive surveys of why firms list their stocks abroad can be found in Karolyi (1998), Pagano, Roell and Zechner (2002), Doidge, Karolyi and Stulz (2004), Doige, Karolyi, Lins, Miller and Stulz (2005) and Karolyi (2006).

[6] Other studies relate these ADR performances to the market segmentation hypothesis. They include Kadlec and Mcconnell (1994), Sundaram and Logue (1996), Miller (1999), Levine and Schmukler (2006), Forester and Karolyi (1993,1998, 1999, 2000). Theoretical models on how firms in segmented markets can lower their costs of capital and thus increase their market values can be found in Stapleton and Subrahmanyam (1977), Errunza and Losq (1985), and Alexander, Eun and Janakiramanan (1988).

idiosyncratic in nature. One would suspect that market timing ability of these set of firms would be limited, and therefore the analysis of these firms is performed separately. For convenience, we refer the sample firms without listing history in their home countries as initial public offerings (IPO) sample while all others as seasoned equity offers (SEO) sample. Because the SEO sample is larger and timing effect is more likely to be present, our focus will be on the SEO sample.

Our primary findings are that, for the SEO sample, there is some evidence supporting timing ability of these firms, particularly in the U.S. equity market and some in the currency market. However, the evidence of timing effects is far from overwhelming. Regarding the role of regulations, the results are somewhat consistent with SOX having an effect on market timing ability; however, the evidence here is also weak. As for the IPO sample, the results are generally inconclusive. Taken together, the overall results suggest that the timing ability of foreign firms selling ADRs is very limited. Assuming that a strong timing effect is present in the U.S. market, as some studies show, our results here indirectly suggest that foreign firms as a whole are not well-informed about market conditions.

The rest of this essay is organized as follows: Section 2.3 gives a review of the related studies. Section 2.4 presents the hypotheses and the methodology. Section 2.5 specifies the data sources and sample construction. Section 2.6 provides the empirical results and discussions. Section 2.7 concludes the findings of this paper.

2.3 Literature Review

The literature review is arranged in the following order: first theories and empirical studies related to security issuance timing, and then the relatively few empirical studies on ADR issuances.

Several empirical studies document evidence that managers time the market when they issue equity. Myers and Majluf (1984) put forth a theory that under information asymmetry, managers possessing superior information about the future prospects of their firms have incentive to issue overvalued equity. Thus, in equilibrium, we tend to see poor quality firms issue equity. As a result, stock price of issuing firms falls upon the announcement of new equity issues.

Ritter (1991, 2003) examines the ability of managers to create value for existing shareholders by timing IPOs. He finds, on average, IPOs underperform in the long term, suggesting that IPO issuers have timing ability. He argues that, in so doing, the managers take advantage of the time-varying relative costs between debt and equity arisen from market inefficiencies. These managers issue equity when their stock prices are high. They will turn to internal funds or debt issues when they find that their stock prices are low. On the other hand, investors do not seem to realize the pricing implications of this timing behavior. Also, Graham and Harvey (2001) survey reveals that most of the CFOs responding to the survey take into consideration the amount by which their stocks are undervalued or overvalued in issuing equity. These corporate executives consider perceived mis-valuations of their firms and stock price run-ups as two major determinants of their equity issue decisions. These findings are consistent with the earlier documentation of Lucas and McDonald (1990) that firms in general issue seasoned equity after a run-up in their stock prices.

Some studies attribute the poor post-issue performance of equity issuing firms to the market timing activities of the firms' managers. Loughran and Ritter (1995) show that these firms (either IPO or SEO) significantly underperform the non-issuing firms for five years after the offering date. The average annual return is merely 5 percent for IPO firms and 7 percent for

SEO firms. This underperformance is economically significant since it would require investors to invest 44 percent more money in the issuing firms so as to achieve the same result as investing in the comparable non-issuing firms matched by market capitalization. Consistent with some previous findings[7], Loughran and Ritter (1995) demonstrate that issuing firms take advantage of investors' mis-valuations of both IPOs and SEOs in issuing equity. Lee (1997) studies whether managers knowingly sell overvalued equity by examining the relation between top executives' trading and the long-run stock returns of firms that had made seasoned equity offering(s). He finds that top executives often sell their shares before the offerings, suggesting that they perceive that the equity is overvalued by the market[8]. Taking a different track in analyzing the market timing of equity offering by corporate managers, Burch, Christie and Nanda (2004) compare the one-year post-issue performance of firms making rights offers to those making firm commitment SEOs. They argue that if managers want to take advantage of their private information and the overvalued stock, they will be more likely to go for firm commitment offering than a rights offering. Based on the theory of Myers and Mujluf (1984), the use of firm commitment offerings suggests that managers are more concerned with the welfare of the existing shareholders and have greater incentive to time the market. Burch, Christie and Nanda (2004) find significantly negative abnormal returns for firms using firm commitment offerings but not for those relying on rights issues. Their result implies that firm commitment offerings were timed but rights offerings were not.

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[7]Literature on mis-valuation of IPOs include Jain and Kini (1994) : the median operating cash flow-to-assets ratio of IPO firms fell tremendously over the year before going public to the three years after that; Mikkelson and Shah (1994) : while the sales of IPO firms grew, total cash flows stayed about the same as at the offering time; Lerner (1994): IPO activity is highly associated with the price at which the public investors are willing to pay. As for mis-valuation of SEOs, there are earlier Stigler (1964) and Friend and Longstreet (1967) and more recently Lucas and McDonald (1990). Stigler (1964) and Friend and Longstreet (1967) both find that issuing firms do poorly over the long run. Lucas and McDonald (1990) shows undervalued firms delay their equity offering.

[8]Other studies that had reported significant increase in insider trading around SEOs and are consistent with the notion of insiders intentionally sell overvalued equity include Karpoff and Lee (1991) and Kahle (1995).

It is not uncommon to find new equity issues clustering at certain times. Loughran, Ritter and Rydqvist (1994), Eckbo and Masulis (1995), Loughran and Ritter (1995), Baker and Wurgler (2000) and Burch, Christie and Nanda (2004) look at the market timing activities of equity issues clustering in hot issue markets with strong stock market performance and business expansion. They find that firms issue relatively more equity right after a year of their own high equity returns and just before years of low market returns. Baker and Wurgler (2000)'s explanation for this phenomenon is that when a firms' equity is overvalued due to a change in investor sentiment, managers would issue equity to take advantage of these mis-valuations. These “hot issue market” studies also suggest that equity issuers do not only time their idiosyncratic returns but also the market returns.

As financial markets become more and more integrated globally, potential market timing in international security issuance decisions is gaining attention. Loughran, Ritter and Rydqvist (1994) analyze the relation between market timing and the long-run performance of IPOs from an international perspective. They demonstrate evidence that IPO volume is positively correlated with the inflation-adjusted level of stock market. This finding suggests that firms time their IPOs to take advantage of investors' mis-valuations of their stocks. This results in low returns over the long run. In addition, private firms have market timing ability especially when the market multiples are high.

The literature on ADRs market timing effects is sparse. In a study not restricted to ADRs, Henderson, Jegadeesh and Weisback (2003) find that world equity issue may predict future market returns (both within individual countries and world market) because firms tend to increase collectively their equity issues when the market is overvalued. Also, they show that most cross-border equities are issued in U.S. and U.K. when these markets are at or near their peaks. In a series of papers, Schaub (2002, 2003, and 2004) investigates the short-term and long-term performances of ADR issuances, but do not specifically look at the timing issue. Schaub (2002) finds that Mexican ADRs perform well in the short term, but poorly in the long term. Schaub (2003) compare the performance among ADRs from Latin American, Asia-Pacific, and Europe. He demonstrates that, for ADRs, IPOs outperform SEOs and developed market issues outperform those from emerging markets. Additionally, SEOs underperform IPOs in the first year but then outperform the IPO in the second and third year of trading. Both IPOs and SEOs underperform the S&P500 in the short run and long run. He concludes that these results imply that U.S. market overprices ADRs in the short and long term. Schaub (2004) obtains similar results. In addition, he finds some long term wealth effects for Asia-Pacific ADRs when the S&P500 is undergoing major correction. As for the European sample of ADRs, price run-ups seem to occur primarily in the short term (say, day one returns) but not in the long-term.

The paper that is most related to the current study is Pasquariello, Yuan and Zhu (2006). They test whether foreign firms consider currency market conditions in their ADR issuance decisions. They find that foreign firms tend to issue ADRs after their local currency turns abnormally strong or before it becomes abnormally weak against the U.S. dollars. These findings are consistent with the market timing literature on equity markets. In addition, they find that the likelihood of ADR issuances is associated with the prior abnormal returns of a firm's home equity market. On the other hand, the number of ADR issuance is less sensitive to changes in U.S. equity market returns.

In sum, there is some evidence that managers have some market timing ability, but most extant studies look at the U.S. market. Similar findings are obtained from the few studies that examine cross-border equity issuance. However, there is no study that specifically looks at whether the existence of multiple markets and country regulations might affect this market timing ability. This study is trying to fill this gap of the literature.

2.4 Hypotheses and Methodologies

When firms issue equity just domestically, it makes sense for them to time the local equity market as this is the only market involved. When it comes to issuing equity overseas, say via the ADR programs in the U.S., the conditions of three different markets --the home equity market, the U.S. equity market and the currency market--should have an impact on the particular issue. To see this, in the absence of arbitrage opportunities and ignoring transaction costs, the market price of an ADR should be

$$\text{ADR Price} = \text{ADR's Underlying Stock Price} \times \text{ADR Ratio} \times \text{Exchange Rate}$$

With this simple pricing mechanism, both underlying home market price and exchange rate should affect ADR pricing. The market conditions of the U.S. are likely to affect ADR pricing too. However, assuming that firms have more information about their home environment, they are more likely to have the ability to time home equity market and/or currency market, but not the U.S. equity market.

Both home equity market regulations and U.S. equity market regulations may affect the timing ability of the ADR issuers. There is an increasingly large body of literature on the relation between law and finance. For example, LaPorta et al (1998) find a relation between regulation and ownership while others find a relation between law and financing. Generally, firms in countries with restrictive regulations tend to have less access to financing (See Goshen and

Parchomovsky (2004) and Healy and Palepu (2001) for discussions on regulations). The more regulation on investment/capital raising a country has, the more difficulties those firms may encounter in raising capital. This likely limits the choice of when a firm could raise capital. Thus, regulation will be expected to reduce the market timing ability of the ADR issuers.

Based on the above analysis, two hypotheses are to be tested in this study. They are formulated as below.

Hypothesis 1. ADR issuers are more likely to time their home equity and/or currency market, based on information accessibility.

Hypothesis 2. The stricter the regulation, the less the market timing ability of ADR issuers.

To test these two hypotheses, an approach similar to that of Pasquariello, Yuan and Zhu (2006) is adopted here. In their analysis, the number of ADR issues from a country is the dependent variable, while market returns serve as the explanatory variables. Also, they assume that the number of ADR issues follows a Poisson distribution. In this paper, we examine the dollar amount or proceeds of ADR issuance, rather than the number of ADR issues. The use of amount is arguably more relevant to firms than the number of issues. Moreover, the number of issues is probably too crude a metric to assess the importance of timing ability and is potentially influenced by factors such as regulations. The main difference, however, is that this research utilizes firm-level data, rather than country-level data.

The regression model is shown as below.

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h) \quad \text{----------------(1)}$$

where proceeds_{int} is the proceeds of the issue amount, adjusted for firm size, of the ADR issued by firm i of country n in month t, $\text{cummktret}_{nt}(h)$, $\text{cumusret}_{nt}(h)$ and $\text{cumexrret}_{nt}(h)$ are the cumulative returns[9] for the home equity market, U.S. equity market and currency market respectively from h months to one month before the event month or one month to h months after the event month. The local currency exchange rate is defined as the U.S. dollar per unit of local currency.

In this model, β_1, β_2 and β_3 measure the impacts on proceeds of the cumulative returns of the home equity market, U.S. equity market, and currency market respectively. Their signs are our primary focus. A significantly positive estimate of β_i implies that ADR issue proceeds in month t increase with individual realized cumulative returns over $|h|$ month where $h < 0$ ($h > 0$) is $|h|$ month before (after) the issue month. More specifically, for β_i, timing effects are suggested if it is significantly positive before and/or significantly negative after the issuance[10].

Market timing is more critical for a volatile stock. Therefore, we expect that volatile firms to have more incentive for timing. To test this and as a robustness check, we use beta as a

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[9] Pasquariello, Yuan and Zhu (2006) use the abnormal returns after de-trending the return series using an AR(2) formula in the form of
$ret_{nt} = \Phi_{0n} + \Phi_{1n} ret_{nt-1} + \Phi_{2n} ret_{nt-2} + \Phi_{3n} t + \varepsilon_{nt}$. As will be seen later, only a few of the return series in this study have significant trends, therefore, the return series are not de-trended.

[10] If the issue proceeds increase with the pre-issue positive market returns (due to market upswings) and/or with the post-issue negative market returns (as a result of market downturns), this implies that the issuers have some market timing abilities. Similarly, if the issue proceeds decrease with the pre-issue negative market returns and/or with the post-issue positive market returns, again this indicates that the issuers seem to have some market timing abilities. Therefore, we should expect to see a positive beta for the pre-issue periods and a negative beta for the post-issue periods when regressing the issue proceeds adjusting for firm size on the market returns.

measure of volatility. Specifically, we divide the available SEO sample into high beta (beta > 1) and low beta (beta < 1) stocks. The betas are estimated by regressing the one year pre-issue daily returns of the home shares on the home market returns. Because IPOs have no prior trading history, such a test is not possible for the IPO sample here.

The timing ability can be affected by country regulations, either regulation(s) on home equity market or those on U.S. equity market. Lacking a precise measure of regulatory constraints, we divide the countries into tightly and loosely regulated countries based on the financial freedom index[11] and compare the market timing ability between the two sub-samples. The sample of tightly regulated countries consists of China, France, Germany, Greece, India, Japan, Korea and Taiwan, whereas the sample of loosely regulated countries include Hong Kong, Ireland, Italy, Netherlands, Singapore, Spain, Switzerland and U.K.

Doidge, Karolyi and Stulz (2006) find evidence that the U.S. market remains competitive after the enactment of SOX. Litvak (2006) finds that ADRs (Level II or III) that are subject to SOX experience stock price declines, while those not subject to the act do not. His findings suggest that SOX has an impact on ADR pricing. We expect that it will have an impact on ADR issuance as well, specifically less timing effect post SOX. The SOX was enacted in 2002, accordingly the sample is divided into two periods -- before 2002 and after 2002.

[11] The financial freedom index is an index, which measures the degree of a country's financial system subject to government regulations, tracked jointly by the Wall Street Journal and the Heritage Foundation. It is a component index of the broader economic freedom index. Both indexes rank the countries using a scale from 1 to 100 where lower score indicates heavy regulations and higher score implies free.

2.5 Data and Sample Description

The capital raising ADR sample is formed by merging the ADS issues recorded in the database of Security Data Company (SDC), the DR capital raising database of Citibank (http://wwss.citissb.com/adr/www/brokers/index.htm), the DR directory of Bank of New York (http://www.adrbny.com/capraising_directory.jsp) and the DR universe of ADR.com (http://p2.adr.com/ADRII/DRUniverse.aspx?quicksearch=N). The local equity market and U.S. equity market returns are calculated from their monthly index levels downloaded from the Reuters Data Link. The exchange rates are downloaded from the Federal Reserve Bank of St. Louis (http://research.stlouisfed.org) website and Reuters Data Link. Betas of ADR issuers, if applicable, are calculated from the daily prices of home shares and daily close level of corresponding market indexes obtained from Reuters Data Link. Market values of the ADR issuing firms are obtained from Compustat. Information on financial freedom index is downloaded from The Wall Street Journal and The Heritage Foundation website (http://www.heritage.org/research/features/index/index.cfm).

The sample period of this study spans from January 1998 to December 2006. The reason for examining this particular time period is to have an equal length before and after the passage of Sarbanes Oxley Act of 2002. The pre-SOX subsample runs from 1998 to 2001 whereas the post-SOX subsample from 2003 through 2006. The entire sample includes Level III (U.S. listing & public offering) ADRs only. Level I (unlisted) ADRs, Level II (U.S. listing without public offering) ADRs, Rule 144A (U.S. private placement) ADRs and GDRs (listed and/or raise capital outside U.S.) are excluded; the major reason for their exclusion is that they are not subject to the same registration and reporting requirements as those of Level III. The Global

Depositary Receipt Reference Guide 2008 by JPMorgan ADR Group has a comprehensive description on the difference in the characteristics of all the ADR types.

As can be seen in Table 2.1, China (26) has the most IPO issues during the sample period and Taiwan (17) has the most SEO issues. The mean issue price ranges from $9.24 (Netherlands) to $59.61 (Japan). Switzerland ($1,082.36 mil) has relatively the largest mean ADR issue size whereas Spain ($26.74 mil) the smallest. Japan ($74,488.66 mil) has on average the largest ADR issuing firms while Ireland ($662.56 mil) has the smallest.

Table 2.2 shows the number of available monthly observations, mean, standard deviation, R^2, first order autocorrelation, second order autocorrelation as well as the Box-Ljung statistics for the time series of the currency market returns, home equity market returns and U.S. equity market returns. The Box-Ljung statistics computed up to 6 lags (LB(6)) indicates that the monthly exchange rate return series for all countries in the sample are white noise except Japan, China, India, South Korea and Ireland. LB(6) for the home equity market returns demonstrate that only the South Korea equity market return series is not white noise. As a result, unlike Pasquariello, Yuan and Zhu (2006), the return series in this study are not de-trended.

Table 2.1 Summary Statistics on ADR Issues

This table reports the descriptive statistics of the ADR issues studied in this essay. It shows the number of ADRs of each country, which in turn, is grouped under 3 regions. Number of IPO issues, SEO issues, mean issue prices and mean amount of capital raised are extracted from various sources including SDC, ADR.com, Bank of New York and Citibank. Market Values of the ADR issuers are obtained from Compustat.

Country	Number of IPO Issues	Number of SEO Issues	Mean Issue Price (U.S.$)	Mean Amount of Capital Raised (U.S.$, mil)	Mean Market Value of ADR issuers as in the Issue Month (U.S.$, mil)
Asia Developed					
Hong Kong	8	5	20.95	401.46	7,843.31
Japan	0	3	59.61	88.78	74,488.66
Singapore	1	1	43.00	401.72	7,450.65
Asia Developing					
China	26	5	19.88	271.83	12,154.50
India	3	14	32.26	307.83	6,689.44
South Korea	5	13	21.03	530.79	9,084.03
Taiwan	0	17	12.55	708.52	23,783.02
Western European					
France	3	5	35.45	101.53	2,475.05
Germany	2	2	32.97	507.16	48,825.87
Greece	0	1	10.19	250.00	10,522.23
Ireland	1	3	23.20	234.53	662.56
Italy	2	0	27.11	566.20	26,672.53
Netherlands	0	2	9.24	136.14	7,569.67
Spain	0	2	11.61	26.74	34,007.98
Switzerland	2	0	24.04	1,082.36	6,801.02
United Kingdom	2	6	37.19	182.82	8,736.31

Table 2.2 Summary Statistics of Equity and Currency Market Returns

This table shows the number of available monthly returns, mean, standard deviation, R^2, first order autocorrelation (ρ(1)), second order autocorrelation (ρ(2)) and the Box-Ljung statistics (computed up to lag 6) for the exchange rate return series in Panel A and local equity market return and U.S. equity market return series in Panel B for the period from July 1997 through June 2007. p-values are reported in brackets. (*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

		Panel A : Exchange Rate Returns						**Panel B : Equity Market Returns**					
Country	**Number of Monthly Returns**	**Mean**	**Std Dev**	**R^2**	**ρ(1)**	**ρ(2)**	**LB(6)**	**Mean**	**Std Dev**	**R^2**	**ρ(1)**	**ρ(2)**	**LB(6)**
Asia Developed													
Hong Kong	120	-.007%	.11%	0.02	-.16*	-.001	4.22	.32%	7.79%	0.001	-.01	.03	5.31
		(0.47)			(0.09)	(0.99)	(0.64)	(0.65)			(0.94)	(0.73)	(0.50)
Japan	120	-.05%	3.36%	0.06	-.14	.17*	17.86***	-.09%	5.84%	0.01	-.01	.079	3.27
		(0.86)			(0.14)	(0.06)	(0.01)	(0.87)			(0.93)	(0.39)	(0.77)
Singapore	120	-.05%	.76%	0.003	-.05	.03	8.31	.49%	7.60%	0.01	.10	.034	4.41
		(0.74)			(0.62)	(0.73)	(0.22)	(0.49)			(0.30)	(0.72)	(0.62)
Asia Emerging													
China	120	.07%***	.23%	0.11	.21**	.24***	31.87***	.96%	7.10%	0.03	.16*	.03	7.04
		(0.001)			(0.02)	(0.01)	(0.00)	(0.14)			(0.09)	(0.72)	(0.32)
India	120	-.10%	1.41%	0.04	.20**	-.02	16.75***	1.02%	7.61%	0.01	.012	.08	5.72
		(0.43)			(0.03)	(0.84)	(0.01)	(0.14)			(0.89)	(0.38)	(0.46)
South Korea	120	.02%	4.38%	0.30	.62***	-.32***	31.79***	.70%	9.91%	0.07	.27***	-.13	11.77*
		(0.95)			(0.00)	(0.00)	(0.00)	(0.44)			(0.01)	(0.16)	(0.07)
Taiwan	120	-.14%	.66%	0.04	.21**	.02	9.12	-.005%	7.97%	0.01	.042	.09	7.19
		(0.37)			(0.03)	(0.83)	(0.17)	(0.99)			(0.65)	(0.31)	(0.30)

Table 2.2 Cont.

Country	Number of Monthly Returns	Panel A : Exchange Rate Returns Mean	Std Dev	R^2	ρ(1)	ρ(2)	LB(6)	Panel B : Equity Market Returns Mean	Std Dev	R^2	ρ(1)	ρ(2)	LB(6)
Western Europe													
France	120	-.49%**	2.50%	0.03	.16*	-.09	6.57	.59%	6.03%	0.02	.027	.14	5.75
		(0.03)			(0.08)	(0.32)	(0.36)	(0.28)			(0.77)	(0.12)	(0.45)
Germany	120	-.50%**	2.50%	0.03	.16*	-.09	6.45	.61%	7.20%	0.01	.05	.093	8.09
		(0.03)			(0.08)	(0.32)	(0.37)	(0.36)			(0.58)	(0.31)	(0.23)
Greece	120	-.50%**	2.6%	0.02	.15	.0002	5.41	.97%	8.74%	0.003	.06	-.01	9.54
		(0.04)			(0.12)	(1.00)	(0.49)	(0.23)			(0.51)	(0.92)	(0.15)
Ireland	120	-.79%	11.99%	0.27	-.59***	-.23***	71.71***	.84%*	5.50%	0.01	.11	-.05	5.97
		(0.47)			(0.00)	(0.01)	(0.00)	(0.10)			(0.23)	(0.57)	(0.43)
Italy	120	-.51%**	2.50%	0.03	.16*	-.09	6.45	.74%	6.02%	0.01	.03	.09	2.08
		(0.03)			(0.09)	(0.32)	(0.38)	(0.18)			(0.77)	(0.32)	(0.91)
Netherlands	120	-.49%**	2.5%	0.03	.16*	-.09	6.51	.27%	6.60%	0.03	-.03	.16**	7.98
		(0.03)			(0.08)	(0.32)	(0.37)	(0.65)			(0.74)	(0.08)	(0.24)
Spain	120	-.50%**	2.5%	0.03	.16*	-.09	6.48	.82%	6.15%	0.001	-.02	.02	2.68
		(0.03)			(0.08)	(0.31)	(0.37)	(0.15)			(0.84)	(0.81)	(0.85)
Switzerland	120	.16%	2.84%	0.0005	.0001	-.02	4.52	.40%	5.41%	0.02	.12	-.07	4.19
		(0.54)			(1.00)	(0.81)	(0.61)	(0.41)			(0.19)	(0.45)	(0.65)
United Kingdom	120	-.16%	2.15%	0.03	-.10	-.14	7.05	.28%	4.20%	0.01	-.05	.05	3.16
		(0.41)			(0.26)	(0.14)	(0.32)	(0.47)			(0.60)	(0.58)	(0.79)
United States	120							.44%	4.13%	0.02	.09	-.09	2.85
								(0.24)			(0.32)	(0.34)	(0.83)

2.6 Empirical Results and Discussions

The SEO results will be discussed first, since the size of the SEO set is larger and is more representative of a typical issue. This is followed by IPO results in section b.

a. Seasoned Equity Offers

Table 2.3 reports the regression results for the SEO sample. Regarding the SEOs as a whole, the finding seems to suggest that the SEO issuers time the U.S. equity market as the coefficient for the U.S. equity market returns, $\beta_2(h)$, is positive for all the event windows before and one month after the issuance and negative thereafter. The coefficients are significant for the pre-issue 6-month and 1-month and post-issue 6-month. However, the results also suggest that the firms maybe issuing the ADRs too early. In addition, Table 2.3 implies that the SEO issuers have some timing ability regarding the currency market, since the coefficient for currency market returns, $\beta_3(h)$, is significantly negative in the post-issue 2-month event window. But the evidence in timing the currency market is not as obvious as in the timing of the U.S. equity market.

Table 2.3 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of All SEOs

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-9987***	0.01	12795*	0.07	-7154	0.25	0.07
5 months before	-10734***	0.01	7800	0.30	-6920	0.32	0.06
4 months before	-8351*	0.08	7927	0.36	-1989	0.73	0.04
3 months before	-11568**	0.02	14570	0.16	1145	0.88	0.03
2 months before	-8314	0.13	12521	0.29	2780	0.84	-0.07
1 month before	-18644**	0.02	47239***	0.01	-1981	0.93	0.06
1 month after	-10316	0.19	3574	0.82	-5811	0.64	-0.01
2 months after	-1279	0.81	-17201	0.13	-31194*	0.07	0.04
3 months after	-662	0.87	-14608	0.16	-19630	0.19	0.02
4 months after	560	0.87	-4668	0.59	-7583	0.57	-0.03
5 months after	1529	0.66	-11008	0.14	-9134	0.45	-0.03
6 months after	3092	0.30	-14102**	0.02	-12695	0.25	0.04
Obs	79						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Arguably the ability of market timing could depend on firm volatility. It is plausible that more volatile firms would have more incentive to time the issuance. To investigate this possibility and also as an additional robustness check, we separate the sample into high-beta (beta > 1) and low-beta (beta < 1) stocks, where beta is a measure of firm volatility. As illustrated in Table 2.4, the evidence for timing the U.S. equity market appears to be present for high-beta stocks. On the other hand, Table 2.5 shows no significant pattern emerges for the low-beta stocks. These differences in the two groups are consistent with our expectation. The results reinforce the previous conclusion that there is some evidence of SEO firms timing the U.S. equity market, particularly the high beta ones.

As mentioned earlier, another important objective of this study is to examine the role of regulations. To this end, we compare the timing evidence between tightly and loosely regulated countries and before and after SOX. Tables 2.6 and 2.7 provide the results for the two types of countries. From Table 2.6, SEO issuers in the tightly regulated countries seem to time the U.S. equity market. This is suggested by the positive coefficients for the U.S. equity market returns, $\beta_2(h)$, throughout the pre-issue periods and negative for the post-issue periods. They are statistically significant in the 1-month and 6-month before and all the periods except 1-month and 4-month after the issuance. Table 2.7 shows that there might be some possible timing of the home equity market or currency market by the SEO issuers in the loosely regulated countries as $\beta_1(h)$ is significantly positive in the pre-issue 4-month and 5-month and $\beta_3(h)$ is significantly negative in the post-issue 6-month period for the home and currency market respectively. It could be that tightly regulated countries have more regulations in both their stock market and currency market. Thus, the SEO issuers of these countries tend to time the U.S. market. On the other hand, there are relatively fewer restrictions in the stock and currency markets in the loosely regulated countries, thus making it possible for SEO issuers to time these two markets.

To investigate the effect of the passage of Sarbanes-Oxley Act on the market timing ability of the ADR issuers, the entire SEO sample is also divided between the pre-SOX and post-SOX periods. Table 2.8 reports the results for the pre-SOX subsample whereas Table 2.9 for the post-SOX subsample. There is some evidence that, as shown in Table 2.8, SEO issuers time the U.S. equity market before the passage of the Sarbanes-Oxley Act (which imposes greater disclosure requirements and higher liability to key management officers in firms that issue securities in the U.S., be they local or foreign firms). Table 2.9 demonstrates that SEO issuers appear to switch to time the currency market after the SOX passage. It can be seen in the table that the coefficient for the currency market returns, $\beta_3(h)$, is significantly negative in all the post-issue periods. This is logical since SOX, to some extent, adds to the regulatory restrictions in the U.S. equity market and in turn increase the difficulty in timing this market.

Table 2.4 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs with High Beta

$$proceeds_{int} = \alpha(h) + \beta_1(h)cummktret_{nt}(h) + \beta_2(h)cumusret_{nt}(h) + \beta_3(h)cumexrret_{nt}(h) + \nu_{nt}(h)$$

$proceed_{nt}$ is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $cummktret_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $cumusret_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $cumexret_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-19157***	0.00	29524**	0.02	2819	0.86	0.16
5 months before	-19546***	0.00	20174	0.14	-15523	0.49	0.12
4 months before	-14100*	0.08	15407	0.34	-68	1.00	0.01
3 months before	-21034**	0.02	27574	0.14	-248	1.00	0.06
2 months before	-18218*	0.09	26761	0.24	596	0.98	0.07
1 month before	-40973***	0.01	99719***	0.00	9138	0.82	0.16
1 month after	-23227	0.13	23400	0.44	-6988	0.69	-0.01
2 months after	-2858	0.79	-21478	0.28	-51722*	0.08	0.05
3 months after	-1011	0.89	-16099	0.41	-28167	0.29	0.01
4 months after	153	0.98	-2896	0.86	-13859	0.59	-0.06
5 months after	2576	0.67	-15647	0.24	-12656	0.63	-0.02
6 months after	8378	.0284	-22335**	.005	-20806	.42	0.05
Obs	47						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.5 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs with Low Beta

$$proceeds_{int} = \alpha(h) + \beta_1(h)cummktret_{nt}(h) + \beta_2(h)cumusret_{nt}(h) + \beta_3(h)cumexrret_{nt}(h) + \nu_{nt}(h)$$

$proceed_{nt}$ is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $cummktret_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $cumusret_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $cumexret_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.002	0.97	.13	0.35	-.09	0.33	-0.04
5 months before	.02	0.80	.14	0.32	-.07	0.51	-0.04
4 months before	.04	0.69	.14	0.42	-.02	0.82	-0.05
3 months before	.05	0.58	-.01	0.96	-.03	0.81	-0.09
2 months before	.01	0.95	.02	0.94	.22	0.41	-0.08
1 month before	-.03	0.81	-.07	0.85	.69	0.14	-0.003
1 month after	-.03	0.83	.07	0.82	.05	0.91	-0.10
2 months after	-.02	0.85	.19	0.43	.24	0.47	-0.07
3 months after	.01	0.89	.23	0.31	.01	0.99	-0.05
4 months after	.04	0.53	.21	0.29	-.02	0.94	-0.03
5 months after	.002	0.98	.09	0.58	-.01	0.97	-0.07
6 months after	-.02	0.76	.14	0.26	.01	0.95	-0.05
Obs	32						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.6 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs of Tightly Regulated Countries

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	R^2
6 months before	-12855***	0.01	17445*	0.06	-11348	0.15	0.10
5 months before	-14063***	0.01	12761	0.19	-9725	0.26	0.09
4 months before	-10479*	0.08	11099	0.35	-4332	0.61	0.01
3 months before	-12656**	0.04	15904	0.21	1429	0.89	0.03
2 months before	-9903	0.14	16768	0.29	4959	0.83	-0.01
1 month before	-20521**	0.04	56386**	0.02	-1735	0.96	0.06
1 month after	-10665	0.29	-7977	0.71	-47725	0.19	0.01
2 months after	-993	0.88	-28343*	0.06	-45640**	0.04	0.07
3 months after	643	0.90	-25663*	0.08	-32877	0.11	0.06
4 months after	1339	0.77	-9502	0.43	-16263	0.41	-0.03
5 months after	2303	0.60	-17749*	0.08	-16944	0.31	0.01
6 months after	4351	0.23	-21739***	0.01	-21179	0.13	0.08
Obs	60						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.7 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs of Loosely Regulations Countries

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	.13	0.52	.22	0.43	-.13	0.60	0.01
5 months before	.27*	0.10	.32	0.20	.14	0.59	0.20
4 months before	.29*	0.10	.33	0.18	.09	0.43	0.31
3 months before	.45	0.21	.06	0.90	-.004	0.99	0.05
2 months before	.49	0.16	-.28	0.50	-.10	0.73	-0.03
1 month before	-.17	0.76	.26	0.73	.32	0.66	-0.18
1 month after	.02	0.95	.13	0.82	-.24	0.25	-0.07
2 months after	.11	0.59	.18	0.65	.06	0.92	-0.11
3 months after	.07	0.69	.18	0.54	-.20	0.69	-0.08
4 months after	.11	0.37	.33	0.18	-.33	0.28	0.16
5 months after	.10	0.45	.11	0.58	-.43	0.18	0.11
6 months after	.12	0.32	.12	0.46	-.63*	0.07	0.19
Obs	19						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.8 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs in the Pre-SOX period

$$proceeds_{int} = \alpha(h) + \beta_1(h) cummktret_{nt}(h) + \beta_2(h) cumusret_{nt}(h) + \beta_3(h) cumexrret_{nt}(h) + \nu_{nt}(h)$$

$proceed_{nt}$ is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $cummktret_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $cumusret_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $cumexret_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-21468***	0.01	28191*	0.09	-18079	0.12	0.12
5 months before	-19631**	0.03	15782	0.37	-12636	0.29	0.08
4 months before	-13710	0.17	12739	0.60	-4272	0.68	-0.03
3 months before	-17720*	0.09	23466	0.40	1432	0.92	0.01
2 months before	-11497	0.30	17716	0.50	6177	0.88	-0.06
1 month before	-25403	0.11	70028*	0.06	-8045	0.88	0.04
1 month after	-14766	0.37	167	1.00	-5283	0.80	-0.07
2 months after	-4196	0.68	-30778	0.17	-54117	0.13	0.02
3 months after	-3486	0.67	-30396	0.17	-31169	0.32	0.01
4 months after	2102	0.78	-6877	0.75	-11164	0.72	-0.10
5 months after	3923	0.60	-26260	0.17	-31369	0.34	-0.03
6 months after	5469	0.39	-34613**	0.03	-42983	0.12	0.09
Obs	33						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.9 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of SEOs in the Post-SOX period

$$proceeds_{int} = \alpha(h) + \beta_1(h)cummktret_{nt}(h) + \beta_2(h)cumusret_{nt}(h) + \beta_3(h)cumexrret_{nt}(h) + \nu_{nt}(h)$$

$proceed_{nt}$ is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $cummktret_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $cumusret_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $cumexret_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	.02	0.80	.40	0.11	-.51*	0.10	0.10
5 months before	.06	0.50	.16	0.43	-.62*	0.10	0.02
4 months before	.07	0.57	.05	0.80	-.18	0.68	-0.07
3 months before	.08	0.59	-.21	0.38	-.07	0.88	-0.06
2 months before	.03	0.83	-.27	0.45	.19	0.67	-0.07
1 month before	.09	0.66	-.86	0.11	-.86	0.16	0.05
1 month after	-.08	0.74	-.46	0.49	-1.14**	0.03	0.12
2 months after	-.05	0.78	.21	0.66	-.85**	0.03	0.09
3 months after	.07	0.45	-.06	0.87	-1.16***	0.00	0.20
4 months after	.05	0.46	-.02	0.93	-.85***	0.00	0.19
5 months after	.04	0.56	.11	0.66	-.53**	0.02	0.09
6 months after	.04	0.55	.06	0.81	-.44**	0.05	0.04
Obs	37						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

b. Initial Public Offers

Table 2.10 reports the regression results for the IPO sample. With respect to the IPO sample as a whole, there is little evidence of market timing. The significantly positive coefficient for the home equity market returns, $\beta_1(h)$, in the pre-issue 1-month period might suggest some market timing but the evidence is not very obvious. This suggests that managers have little timing ability on either equity markets or the currency market. These results seem to make sense, as managers here have no prior experiences in stock markets. To examine if the market timing effects are blurred by the inclusion of firms with different originations or different time periods, we again divide the entire IPO sample between tightly regulated and loosely regulated countries as well as before and after the passage of SOX. Table 2.11 shows that IPO firms from tightly regulated countries time the U.S. equity market since $\beta_2(h)$ is significantly positive in the pre-issue 3-month to 6-month periods. On the other hand, loosely regulated country IPO firms, as illustrated in Table 2.12, do not seem to time any of the three markets. There is no significant pattern observed in this table. As for the pre-SOX and post-SOX subsamples, Table 1.13 suggests that there is no market timing observed for the IPO issuers before SOX but Table 2.14 provides some evidence that, post SOX, there is some timing of the U.S. equity market. The difference between pre- and post-SOX is contrary to our expectations. Nevertheless, the overall evidence of timing effects of IPOs is weak.

Table 2.10 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of all IPOs

$$proceeds_{int} = \alpha(h) + \beta_1(h)cummktret_{nt}(h) + \beta_2(h)cumusret_{nt}(h) + \beta_3(h)cumexrret_{nt}(h) + \nu_{nt}(h)$$

$proceed_{nt}$ is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $cummktret_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $cumusret_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $cumexret_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.25	0.25	.58	0.29	.48	0.57	-0.02
5 months before	-.18	0.44	.42	0.49	.07	0.94	-0.04
4 months before	-.15	0.63	.80	0.27	-.71	0.54	-0.02
3 months before	-.05	0.87	1.31	0.11	.16	0.92	-0.001
2 months before	.45	0.31	.64	0.53	-2.60	0.14	0.03
1 month before	1.10*	0.07	-.04	0.97	-.32	0.87	0.03
1 month after	-.33	0.51	.004	1.00	.02	0.99	-0.05
2 months after	-.34	0.28	.007	0.99	1.62	0.43	-0.02
3 months after	-.13	0.53	-.27	0.77	2.42*	0.09	0.01
4 months after	-.26	0.17	.64	0.28	1.84	0.12	0.02
5 months after	-.18	0.25	.72	0.11	1.64**	0.06	0.05
6 months after	-.18	0.20	.52	0.26	1.56**	0.06	0.04
Obs	55						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.11 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of IPOs of Tightly Regulated Countries

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.22	0.21	1.56***	0.01	.26	0.74	0.13
5 months before	-.17	0.38	1.30**	0.04	-.03	0.97	0.04
4 months before	-.25	0.32	1.80***	0.01	-.23	0.83	0.09
3 months before	.06	0.80	1.38*	0.08	.08	0.96	0.03
2 months before	.45	0.26	.49	0.63	-1.50	0.53	-0.01
1 month before	1.22**	0.04	-1.08	0.34	2.16	0.41	0.06
1 month after	-.12	0.80	.64	0.62	3.63	0.30	-0.05
2 months after	-.30	0.29	1.02	0.27	3.18	0.15	0.01
3 months after	-.11	0.59	.26	0.80	2.17	0.11	-0.004
4 months after	-.14	0.40	.36	0.58	1.63	0.14	-0.01
5 months after	-.09	0.52	.36	0.42	1.18	0.18	-0.02
6 months after	-.11	0.39	.21	0.64	1.08	0.20	-0.02
Obs	39						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.12 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of IPOs of Loosely Regulated Countries

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.09	0.95	-.57	0.81	-.22	0.93	-0.21
5 months before	-.30	0.85	-.83	0.74	-1.70	0.51	-0.14
4 months before	.58	0.72	-1.64	0.51	-3.85	0.24	-0.08
3 months before	-2.42	0.20	3.13	0.30	-.14	0.97	-0.07
2 months before	-.33	0.87	.263	0.94	-3.71	0.31	-0.12
1 month before	1.37	0.50	1.86	0.65	-2.14	0.56	-0.08
1 month after	-1.15	0.51	-.84	0.76	-1.68	0.76	-0.13
2 months after	-1.19	0.53	-1.65	0.61	-.92	0.87	-0.06
3 months after	-.24	0.80	-.96	0.66	3.32	0.51	-0.14
4 months after	-1.59	0.23	2.08	0.20	.96	0.83	-0.04
5 months after	-.70	0.45	1.92	0.13	2.51	0.28	0.04
6 months after	-.85	0.45	2.18	0.16	3.44	0.24	0.04
Obs	16						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.13 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of IPOs in the Pre-SOX period

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.04	0.93	.19	0.83	.84	0.57	-0.17
5 months before	-.03	0.94	-.15	0.86	.15	0.92	-0.19
4 months before	.11	0.84	-.66	0.48	-1.99	0.30	-0.09
3 months before	-.03	0.96	.74	0.52	.96	0.76	-0.17
2 months before	1.02	0.26	-.52	0.64	-3.66	0.14	0.02
1 month before	1.21	0.25	-.15	0.91	2.26	0.39	0.00
1 month after	-.62	0.39	-.48	0.68	-3.01	0.30	-0.03
2 months after	-.66	0.22	.71	0.55	1.23	0.62	-0.07
3 months after	-.09	0.81	-.57	0.71	2.72	0.14	0.04
4 months after	-.07	0.83	.72	0.28	3.60**	0.05	0.09
5 months after	.11	0.73	.43	0.41	2.16*	0.06	0.06
6 months after	.30	0.31	.19	0.67	2.65***	0.01	0.24
Obs	19						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

Table 2.14 Analysis of the Impact of Home Equity, U.S. Equity and Currency Market Returns on the Proceeds of ADR issues : The Case of IPOs in the Post-SOX period

$$\text{proceeds}_{int} = \alpha(h) + \beta_1(h)\text{cummktret}_{nt}(h) + \beta_2(h)\text{cumusret}_{nt}(h) + \beta_3(h)\text{cumexrret}_{nt}(h) + \nu_{nt}(h)$$

proceed_{nt} is the issue proceeds as a percentage of the firm size of ADR issued by firm i from country n in month t, $\text{cummktret}_{nt}(h)$ is the holding period home equity market return of country n in month t for an event window h, $\text{cumusret}_{nt}(h)$ is the holding period U.S. equity market return in month t for an event window h, $\text{cumexret}_{nt}(h)$ is the holding period dollar exchange rate return of country n at month t for an event window h.

Event Window	$\beta_1(h)$	p-value	$\beta_2(h)$	p-value	$\beta_3(h)$	p-value	Adj. R^2
6 months before	-.29	0.26	1.61	0.11	-.24	0.84	0.004
5 months before	-.27	0.41	1.43	0.18	-.18	0.88	-0.03
4 months before	-.38	0.30	2.49**	0.03	-.60	0.67	0.07
3 months before	-.03	0.94	1.64	0.24	-1.03	0.59	-0.02
2 months before	.21	0.71	1.92	0.32	-3.23	0.19	0.03
1 month before	.86	0.26	.191	0.93	-4.34	0.13	0.04
1 month after	-.15	0.83	1.79	0.45	3.92	0.58	-0.06
2 months after	-.13	0.75	-.35	0.84	-1.71	0.67	-0.08
3 months after	-.09	0.73	-.17	0.92	.436	0.86	-0.09
4 months after	-.20	0.45	.31	0.81	.10	0.96	-0.07
5 months after	-.20	0.34	.88	0.46	.72	0.67	-0.06
6 months after	-.22	0.25	.46	0.73	.38	0.79	-0.05
Obs	35						

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

2.7 Conclusions

In this essay, we examine market timing ability using a sample of 134 capital-raising ADR issues from 16 countries issued during the period January 1998 to December 2006. The sample is divided into IPOs and SEOs. Furthermore, we compare the timing effects of high- and low-beta stocks, tightly and loosely regulated countries, as well as pre- and post-SOX. We focus on the proceeds of the individual issues adjusting for firm size in the month of the issuance. For the SEO sample, we find that issuers from high-beta and tightly regulated countries seem to be able to time the U.S. equity market. In addition, pre-SOX, SEO firms tend to time the U.S. equity market whereas post-SOX, they time the home equity or currency markets. The results for the IPO set are generally weaker. Overall, ADRs issuers have some timing ability particularly in the U.S. equity market. While this is inconsistent with they having information advantage in their home countries, it can be explained by the fact that most ADR issuers employ U.S. investment banks in issuing ADRs thus are well-informed regarding the U.S. market. There is also evidence that, albeit weak, regulations play a role in the issuance decision.

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APPENDIX

Table A1.1 Correlation of Variables

	LNGNIPC	shortsell	Distance	disclosure	director liability	shareholder suit	insider	institutional	Noise	R^2	proportion of trading in US.	market liquidity
LNGNIP	1.00											
Shortsell	0.62*** (0.00)	1.00										
Distance	-0.13 (0.12)	-0.15* (0.06)	1.00									
Disclosure	0.19** (0.02)	0.35*** (0.00)	0.06 (0.46)	1.00								
Director Liability	0.25*** (0.00)	0.14* (0.09)	0.12 (0.14)	0.26*** (0.00)	1.00							
shareholder suit	0.33*** (0.00)	0.25*** (0.00)	0.43*** (0.00)	0.47*** (0.00)	0.47*** (0.00)	1.00						
Insider	-0.41*** (0.00)	-0.23 *** (0.01)	-0.005 (0.95)	-0.10 (0.23)	-0.18** (0.03)	-0.22*** (0.01)	1.00					
institutional	-0.30*** (0.00)	-0.16** (0.05)	-0.25*** (0.00)	-0.02 (0.79)	-0.02 (0.81)	-0.13 (0.13)	0.07 (0.43)	1.00				
Noise	-0.36*** (0.00)	-0.17** (0.04)	0.05 (0.54)	-0.04 (0.65)	-0.06 (0.48)	-0.001 (0.99)	0.37*** (0.00)	0.11 (0.20)	1.00			
R^2	0.37*** (0.00)	0.15* (0.07)	-0.09 (0.29)	-0.01 (0.89)	0.03 (0.68)	-0.03 (0.74)	-0.30*** (0.00)	-0.22*** (0.01)	-0.53*** (0.00)	1.00		
proportion of trading in US.	-0.20 ** (0.02)	-0.004 (0.95)	0.001 (0.99)	-0.18** (0.03)	-0.23*** (0.01)	0.03 (0.73)	0.06 (0.50)	0.27*** (0.00)	0.11 (0.19)	-0.03 (0.76)	1.00	
market liquidity	0.31*** (0.00)	0.18** (0.03)	-0.15* (0.07)	-0.00 (0.99)	0.09 (0.28)	-0.03 (0.73)	-0.25*** (0.00)	-0.21*** (0.01)	-0.35*** (0.00)	0.50*** (0.00)	-0.07 (0.39)	1.00

(*), (**) and (***) indicate the estimate is significant at the 10%, 5% and 1% level respectively.

VITA

Oi Lin Cheung was born in Macau (then a Portuguese colony), China. She attended the University of Macau from 1990 to 1997 and earned her Bachelor's degree in Business Information System and Master's degree in Banking and Finance there. After working as a lecturer of Finance for four years at the same school, she started her Ph.D. study in Financial Economics at the University of New Orleans in August 2004. After spending four years at UNO, she had completed her study and will obtain her Ph.D. degree in August 2008.