Are ADRs Different from US Stocks? An Analysis of Idiosyncratic Risks

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Abstract

Determinants of ADR's idiosyncratic risk are examined from the perspective of undiversified investors. Since ADRs enjoy a unique status, vis-à-vis US companies, we study whether determinants of their risk, derived from a two-stage regression model, are different from the one for U.S. firms. For the time period from 1999 through mid 2005, we found that, with the exception of the smallest US stocks in the sample, ADR's idiosyncratic risks are analogous to the ones observed for US firms. Also, ADR's sensitivity to fundamental variables that represent their inner financial structure is similar to US firms.

JEL classification: G11; G15

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1. Introduction

The relevant question of this research is whether American Depositary Receipts (ADRs) are riskier than US stocks. The objective is to determine those factors which make the risk of holding ADRs unique. Specifically, we focus on ADRs idiosyncratic risk, that is the part of the risk return that is not related to market risk. This enables us to compare and contrast identified factors with that of U.S. firms. Market risk in foreign countries has been usually higher than market risk in the US (Figure 1). The question arises whether idiosyncratic risk of ADRs is higher than idiosyncratic risk for US stocks.

Studying idiosyncratic risk for ADRs raises two important preliminary issues. First, does idiosyncratic risk matter? Second, do ADRs matter?

Idiosyncratic risk (in the traditional CAPM model) does not matter. This risk is eliminated through portfolio diversification. This conclusion may be true, however, if all investors are alike and all of them hold the market portfolio. As indicated by Malkiel and Xu (2002), in reality, some investors, as well as active mutual fund managers, deliberately do not hold market portfolios and in turn attempt to generate extraordinary gains by using strategies that lead to less diversification. In fact, these investors do not eliminate idiosyncratic risk. Also, as pointed out by Campbell et al. (2000), some investors are unable to diversify (e.g. incomplete information, restrictions on short sales, taxes, liquidity constraints, transaction costs, etc). So they are impacted by idiosyncratic risk due to exogenous restrictions. Further, arbitrageurs face idiosyncratic risk when they try to exploit mispricing of individual stocks. They face idiosyncratic risk but not market risk. Finally, if options were written on individual stocks (ADRs, in our case) the pricing of these options would require not only market knowledge, it would also require knowledge of idiosyncratic risk. This may make the role of idiosyncratic risk very important for some investors. Although aggregate volatility may be important for understanding risk and return relationships for a portfolio of stocks, the market risk might comprise only one of the components of risk. The other component, idiosyncratic risk, may be a characteristic that matters for important investors in the financial markets.

A second question to be addressed is whether ADRs are important for US investors. ADRs (negotiable security denominated in U.S. dollars that represent ownership of a foreign firm) are usually seen as instruments for international diversification through domestically traded securities. Regulatory changes introduced by the SEC and the massive wave of privatization of public enterprises, contributed to the growth of ADRs. U.S. investment in foreign equity increased from $279 billion in 1991 to almost $2 trillion in 2001 (Kumar, 2003). The number of ADRs listed on the three major U.S. stock exchanges increased from 215 in 1992 to 532 in 2001. Also, the number of countries that have issued depository receipt programs has risen from 24 in 1990 to 78 in 2001. The total global market capitalization of companies issuing depository receipts exceeded $6 trillion at the close of 1999. Firms from emerging markets, such as Argentina, Brazil, Chile, China, India, Indonesia, Malaysia, Russia and South Korea have increasingly utilized the depository receipt markets, and now constitute a majority of such activity. Most of the firms from emerging markets have used ADRs for mobilizing international capital. In recent years, depository receipt issuance has typically accounted for 60 to 70 percent of total equity raised in international markets by emerging market companies. Platt (2004) noted that there is new expectation by market participants for an increase in the use of ADRs to pay for foreign takeovers of U.S. companies. Overall, it is expected that these trends will continue and the importance of ADRS to US investors will continue growing.

Although a number of research issues on ADRs have been examined, none was found to use the approach discussed in this paper. It is believed that this work extends the research literature in an important way by providing a linkage between ADRs and idiosyncratic risk.

This study first isolates the idiosyncratic risk of ADRs. Then, an analysis is conducted to determine whether some firm characteristics are related to idiosyncratic risk measures. These firm characteristics include various accounting based variables, such as size, financial leverage, performance, firm liquidity, and earnings variability[1]. Also, we check for association between idiosyncratic risk and industry and country dummies. We compare our results against four groups of US stocks: S&P500 (Large Caps), S&P400 (Medium Caps), S&P600 (Small Caps) and Micro Caps, which are not included in the previous three indices but also trade in major stock exchanges[2].

Overall, our study concludes the following: First, the level of idiosyncratic risk for ADRs is similar in magnitude with that of firms which belong to the S&P500, S&P400 and S&P600, but are significantly different from Micro Cap firms. Second, the parameters of the regression that associates idiosyncratic risk with fundamental variables (size, and accounting ratios) are statistically the same for ADRs as it is for S&P firms. These parameters, however, are different from the ones for Micro Caps. Third, there is some country effect in the idiosyncratic risk. Furthermore, it is expected that ADRs from Latin American and Asian countries (except Japan) have (ceteris paribus) more risk and Japanese ADRs have lower risk. Finally, industry classification effect (on idiosyncratic risk) is not statistically different between ADRs and S&P firms. Our results are robust as we employ different ways to calculate idiosyncratic risk. The

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1 This approach was used by Chaudhry, Maheshwari, and Webb (2004) in their study of REITs which indicated that efficiency, liquidity and earnings variability were the important variables in determining idiosyncratic risk as opposed to size and capital which were not.

2 From here, we name this last group: Micro Caps.

frequency of the data is monthly. Daily data was not used to avoid micro structure problems that can bias our volatility estimations.

The remainder of this paper is organized as follows. Section two provides the literature review. Section three outlines the theoretical model of idiosyncratic risk. Section four presents the determinants of idiosyncratic risk. The data is described in Section five. The analyses and results are presented in Section six, and the summary and conclusion are discussed in the last section.

2. Literature Review

It is important to mention ADR's special regulations that may have a significant impact on the behavior of their risks and returns. Do SEC's special requirements make ADRs look similar to US stocks? This question can only be answered empirically. SEC regulations state that in order to have ADR's trade in major stock exchanges (NYSE, AMEX and Nasdaq)[3], foreign firms must comply with full registration and reporting standards. In addition, these firms must reconcile their financial statements in accordance with the US GAAP. Annual reports and any interim financial statements must also be submitted on a regular and timely basis to the SEC[4]. Furthermore, all financial statements are audited by independent accountants using US audit standards as a benchmark. For some ADRs (Level III), when they are first offered through IPUS, the companies must include a prospectus to inform investors about the risk profile of their businesses, the plan for distributing the shares, and other related information[5]. U.S. laws also provide legal protection to the US shareholders from fraud if committed by the insiders of these

[3] Level II and Level III ADR programs trade in major exchanges. They constitute our sample. We do not include ADRs that trade Over the Counter (OTC) for two reasons: data availability and (if available), the quality of OTC stock market data.
[4] However, ADRs do not file the standard 10-K or 10-Q required for US stocks.
[5] From JPMorgan's www.adr.com .

foreign firms[6]. However, Siegel (2005) shows evidence that this law has not been enforced against cross-listed foreign firms, which implies that some ADRs still could carry the risk associated with the weak legal system in their home country. Hence, comparing idiosyncratic risks between ADRs and US stocks may also shed light on the probable effects of SEC regulation and stock listing requirements on the behavior of cross-listed stocks.

Our research differs from previous studies on several aspects. For example, Callaghan and Barry (2003) examined ex-dividend date trading of ADRs and found that abnormal ex-dividend date trading is consistent with tax-motivated trading. Bin et al. (2003) found that ADR portfolios were sensitive to movements in both U.S. stock market and the underlying foreign equity market. Significant structural shifts in various risk factors were also noted for ADRs originating in areas where international financial crises occurred.

Karolyi (2004) found that growth and expansion of U.S. crosslisting by firms from emerging markets facilitated cross-border equity flows and overall development of their stock markets during the 1990s. But, some negative spillover effects occurred. Capitalization and turnover ratios of those ADRs that did not pursue crosslisting declined as the number of U.S. cross listings increased. Other findings showed that growth of ADRs neither facilitated nor hindered local market development.

Gorman et al. (2004) investigated whether differences in the way dividends are paid and/or foreign currency risk affect the stock returns and trading volume of ADRs on the ex-dividend day. The result of the cross-sectional regression analysis of ex-dividend day returns and volume were not consistent with a foreign exchange risk premium suppressing dividend capture in ADRs. This suggested that differences in dividend payment policies account for the lower level of dividend capture in ADRs. Fang and Loo (2002) found that although ADRs are traded in

[6] Coffee (1999, 2002a, 2002b) referenced by Siegel (2005).

the U.S. securities markets, their returns are significantly affected by their respective home market factors rather than U.S. market movements. While U.S. investors are exposed to incremental risk from foreign equity markets, they do not command a risk premium. Their findings suggest that markets are segmented and an ADR listing does not provide world capital market integration. Also, ADRs behave like other foreign securities and they are effective for global risk diversification for U.S. investors.

Bin et al. (2004) studied the performance of ADRs surrounding the outbreak of major currency crises during the past decade. They noted that the outbreak of a currency crisis is accompanied by a negatively significant abnormal return for the corresponding ADRs. Lang et al. (2003) investigated the relationship between cross listing in the United States and the information environment of non-U.S. firms. They found that the firms that cross list on U.S. exchanges have greater analyst coverage and increased forecast accuracy than firms that are not cross listed, and also firms that have more analyst coverage and higher forecast accuracy have higher valuations. They suggest that cross listing enhances firm value through its effect on the firm's information environment. Schaub (2003) found that the U.S. markets overprice ADRs in the short and long-term. The underperformance of ADRs is most severe for initial public offering (IPO) issues as compared to seasoned equity offerings. ADRs behave as domestic IPOs in the long term, which means they underperform.

With regard to idiosyncratic risk itself, several studies can be cited. Work by Campbell et al. (2001) and Irvine and Pontiff (2005) found that idiosyncratic volatility has increased in recent years as compared to market volatility which changed on a temporary basis. Goyal and Santa-Clara (2003) studied idiosyncratic risk on market return and its forecasting capability. Chaudhry et al. (2004) examined real estate investment trusts and their idiosyncratic risk.

3. Estimating Idiosyncratic Risk

A basic CAPM-type model for an ADR (expressed in US dollars) can be written as:

$$r_{jt} = (1-\beta_j)\, R_{ft} + \beta_j R_{mt} + \varepsilon_{jt}$$

where r_{jt} (the ADRs return expressed in US dollars) is a weighted average of the country-specific risk free rate (expressed in US dollars, R_{ft}) and its country market return (in US dollars, R_{mt}). The weight is beta (β_j). The idiosyncratic risk is defined as the standard deviation of the errors, $\sigma(\varepsilon_{jt})$[7]. For empirical implementation, the following relation was used:

$$r_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt} \qquad (1)$$

The expression $(1-\beta_j)R_{ft}$ is estimated. This approach was taken because it was difficult to select the relevant risk free interest rate (in dollars) to be used for many countries in the sample.

Taking the variance of both sides of (1) results in:

$$\sigma^2(r_{jt}) = \beta_j^2\, \sigma^2\, (R_{mt}) + \sigma^2(\varepsilon_{jt}) \qquad (2)$$

In the above equation σ is the standard deviation. It is assumed that the market return is orthogonal to idiosyncratic risk or the error term is independent and identically distributed (iid)[8]. $\sigma^2(\varepsilon_{jt})$ will be employed as a volatility measure for idiosyncratic risk, which will be regressed against various stock characteristics.

Other types of alternative CAPM-type relations were used to calculate idiosyncratic risks[9]:

$$r_{jt} = \alpha_j + \beta_j R_{mt} + c_j\, (R_{ut} - R_{mt}) + \varepsilon_{jt} \qquad (3)$$

$$r_{jt} = \alpha_j + \beta_j R_{mt} + c_j\, (R_{ut} - R_{mt}) + d1_j\, SMB_t + d2_j\, HML_t + \varepsilon_{jt} \qquad (4)$$

where R_{ut} is the US Stock Market Return, and SMB_t and HML_t are the Fama-French Factors (Small minus Big, High minus Low). $R_{ut} - R_{mt}$ is the premium return of US Stock Market Return

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[7] For our econometric estimations, however, we use the log of the RMSE (Root Mean Square Error) from each equation.

[8] It is also assumed that the Risk Free rate was constant during the period.

[9] Even though we are analyzing foreign securities, changes in the exchange rate are not used as the explanatory variable. Even if all the variables in the regression are expressed in US dollars, a role for the exchange risk is expected. However, there had been a series of studies that unsuccessfully tried to find empirical support for this exchange rate effect. See Jorion (1990), Bodnar and Gentry (1993), Amihud (1994), Bartov and Bodnar (1994) and others. On the other hand, Dahlquist and Robertson (2001) found supportive evidence for a sample of Swedish firms. We ignore the exchange rate and use, in the second stage, geographical dummies to capture some of this effect, if it is there.

over Foreign Country Market Return (usually negative). These factors were introduced to capture the effect of US factors on the ADR return [10] [11].

Similar to equation (2), the volatility of ADR returns for equations (3) and (4) can be expressed in the following way:

$$\sigma^2(r_{jt}) = \beta_j^2\ \sigma^2\ (R_{mt}) + c_j^2\ \sigma^2\ (R_{ut}) +\ \sigma^2\ (\varepsilon_{jt}) \qquad (5)$$

$$\sigma^2(r_{jt}) = \beta_j^2\ \sigma^2\ (R_{mt}) + c_j^2\ \sigma^2\ (R_{ut}) + d1_j^2\ \sigma^2\ (SMB_t) +\ d2_j^2\ \sigma^2\ (HML_t) + \sigma^2(\varepsilon_{jt}) \qquad (6)$$

Relations (5) and (6) differentiate the determinants of volatility of ADR returns among the domestic market related factor ($\beta_j^2\ \sigma^2\ (R_{mt})$), US market related factors[12] ($c_j^2\ \sigma^2\ (R_{ut}) + d1_j^2\ \sigma^2\ (SMB_t) +\ d2_j^2\ \sigma^2\ (HML_t)$) and firm-specific characteristics, $\sigma^2(\varepsilon_{jt})$.

4. Determinants of Idiosyncratic Risk

Using these measures of idiosyncratic risk, $\sigma(\varepsilon_j)$, the following model was estimated in a cross sectional setting:

$$\begin{aligned}\sigma(\varepsilon_i) = {} & \psi 0\ +\ \psi 1\ Size_i + \ \psi 2\ Leverage_i\ +\ \psi 3\ \ Performance_i\ +\ \psi 4\ Liquidity_i\ + \\ & \psi 5\ Earnings_i + \\ & (Industry\ Dummies)_i\ + \\ & (Geographical\ Region\ Dummies)_i\ +\ \lambda_i \qquad (7)\end{aligned}$$

In these equations, some firm characteristics, industry and geographical variables were used. The firm characteristics are *Size* (which is size of the firm), *Leverage* (which is defined as the degree of financial leverage and is measured by [(Total Assets – Stockholders' Equity) / Total Assets]), *Performance* (measured by [EBIT / Total Assets], *Liquidity* (which is defined as [Cash and Short-term Assets / Total Assets]), and finally, variability of *Earnings* (which is measured by [standard deviation of EBIT/ Total Assets]). *Industry Dummies* were created using the Twelve Industry Classification from the Kenneth French website. The industry sectors are Consumer Non-Durables, Consumer Durables, Manufacturing, Energy, Chemicals, Business Equipment, Telecom, Utilities, Shops, Health, Finance, and Other. Financial firms are not included because they are different from other firms in that their high *leverage* is not necessarily

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[10] Karolyi and Stulz (2002) found that domestic stocks are influenced by foreign factors.

[11] Similar equations were used for US Stocks. In this case, the dependent variable is the monthly return (with dividends). The explanatory variables are the US Market Return (CRSP Value weighted return with dividends), the MSCI World return (with dividends) net of US Market Return and the two Fama-French factors (SMB and HML).

[12] Assuming the factors are orthogonal each other.

related with distress. The *Geographical Region* dummies represent major industrial economies or group of countries: UK, France, Germany, Other European countries, Latin American countries, Japan and Other Asian countries.

The same procedure was used for US firms whereby a benchmark was created to compare ADR results. US firms were classified in four groups: S&P500 (Large Caps), S&P400 (Medium Caps), S&P600 (Small Caps) and Other (Non-S&P firms that trade in Major Stock Exchanges). Idiosyncratic Risks were estimated for each of these firms for the same period using the same methodology applied for ADRs. Then, a model specified in equation (7) was used to create the benchmarks.

The rationale for selecting the specific factors, which were examined, is discussed below. It should be noted, however, that these factors could also be associated with idiosyncratic risk for US firms. They are not unique to ADRs and we will explore whether ADRs are more sensitive to changes in these variables than US firms.

4.1. Size

It could be hypothesized that larger firms are more likely to have a larger number of investors. As a result, their stocks would be more insulated from fluctuations in market prices than smaller firms, which are unable to achieve such a level of diversified investors. Therefore, smaller firms are more likely to be impacted by the idiosyncratic component of the risk. We expect a negative sign for Size. Our proxy for Size variable is the Log of Book-Value. The Market Value of ADRs is not used as indication of Size since it would include only those shares trading in the US[13].

4.2. Financial Leverage

Higher levels of borrowing are likely to magnify or leverage the earnings. This is likely to increase the bankruptcy risk. In addition, it is also likely to exacerbate the agency problems between the managers and the bondholders. Therefore, financial leverage is expected to be

[13] Even if we include the market value of shares traded abroad, our estimate of Size (as a proxy of the value of the firm) would still be biased. The reason is that many foreign countries are controlled by family groups. This characteristic may have a significant effect on the value of the firm (that is not captured by shares outstanding time market price).

positively correlated with the idiosyncratic risk. In this study, financial leverage is measured by [(total assets – stockholders' equity)/total assets].

4.3. Performance Measures

This ratio measures how efficiently the assets of the firm are utilized. It also shows Managements' ability. More productive firms can be distinguished by their ability to generate operating income from their operations. The measure is Earnings Before Interest and Taxes (EBIT) over Total Assets. Since, higher operating income is hypothesized to have an inverse (negative) relationship with idiosyncratic risk.

4.4. Liquidity Risk

Liquidity risk may arise if the firm is unable to liquidate assets without loss of value and within a reasonable time period. It is related to the likelihood of not being able to meet their payment obligations. Cash and marketable securities, divided by total assets was employed as the measure of liquidity risk. This measure is expected to be negatively correlated with idiosyncratic risk.

4.5. Earnings Variability Risk

Stable earnings would be negative associated with idiosyncratic risk. This can be measured by computing the standard deviation of EBIT divided by total assets. The higher the variability of earnings, the more positively significant this coefficient would be when regressed against the idiosyncratic risk measures.

4.6. Geographical-Country Dummies

ADRs from different countries can have different volatilities related with currency and political risks, different macroeconomic conditions and phases of their business cycles. Some of these characteristics can be captured by Market Factors, other ones can be observed through the residuals (of the CAPM-type regressions). We include dummies to test whether some of these country-characteristics are reflected in the firm's idiosyncratic risks. We created dummies for all major industrial countries (Japan, Germany, UK and France). For the other countries, we grouped them in geographical regions (Other Europe, Other Asia and Latin America) since the alternative option (of creating dummies for each country) would have produced not well populated groups (for example; Hungary, Poland and Turkey have each one ADR in our sample).

4.7. Industrial Dummies

Type of industry could be a factor that explains different volatility among securities that are not captured in the factor loadings. We grouped firms in 11 categories following Ken French classification. Financial firms were not included so our final number of industrial categories is eleven.

5. Data

The data used in this study were obtained from several databases including CRSP, Compustat, Morgan Stanley Capital International (MSCI) and Global Insight. ADRs from 36 countries were examined and only those with at least 24 months of stock market returns were selected. The source for monthly returns with dividends is CRSP that provides market data for those ADRs that trade in major stock exchanges (NYSE, NASDAQ and AMEX).

Financial ratios were created using accounting variables from Compustat. Only firms with non-missing accounting data and at least 3 years of financial statements were included. Total Assets is the average Data6 for the period. Leverage is defined as the average of (Data6 – Data216) / Data6 (Data216 is "Stockholders' Equity-Total"). Performance was created as the average of Data178 / Data6 (Data178 is "Operating Income After Depreciation"). Firm Liquidity is average of Data1 / Data6 (Data1 is "Cash and Short-Term Investments") and Dispersion of Earnings is the standard deviation of the ratio Data178 / Data6.

Industry dummies were created using Compustat's Industrial Identifiers (SIC codes) and the Fama-French Classification that is available through the Kenneth French website. This web site is also the source for market indices returns and factors.

MSCI country indices were available from Global Insight. Their data begins in 1999 and, as such, this restriction constrained the sample size. The final sample consists of 357 ADRs within the January 1999 through June 2005 period. It is recognized that using this timeframe creates a survivorship bias as outlined by Jorion and Goetzmann (1999) and therefore is a limitation of our study.

For our benchmark of US firms, companies were classified as a constituent of an S&P index or not. Compustat's Prices, Dividends and Earnings database was used for this classification. The same restriction was applied to ADR firms (at least 24 months of market data, and at least 3 years of financial statements) in order to keep US firms as benchmarks. US Market returns used for the benchmark equations came from CRSP (Total Market Value-Weighted Return with dividends). Also, MSCI World returns (with dividends) come from Global Insight.

Using this information, in the first stage of the analysis, the measures for idiosyncratic risk were computed from the market returns on ADR indices. These values were computed for individual ADRs using the models defined and discussed above. For the second stage of analysis, average values for the accounting based measures over the six and a half year interval were constructed. The measures of idiosyncratic were used as the dependent variables and were regressed against the accounting measures, and industrial and geographical variables in the cross-sectional regression model.

6. Analysis and Results

Table 1 introduces our ADR Sample. It contains 357 ADRs from 36 countries. This list represents firms from Europe, Asia and Latin America with emphasis in the first region. An obvious question that arises is, based on descriptive statistics, are ADRs small firms? ADR firm sizes (mean and median) are presented in the third and fourth column (in millions of US dollars). The firm size is the Total Assets available from 1999:01 to 2005:06. The average size for all countries (in the row "All ADRs") illustrates that mean firm size US$ 14,968 millions. From this it is evident that ADRs are not small firms. They are approximately two-thirds the size of a typical firm from the S&P500 (US$ 18,631 millions) and more than five times larger than the average S&P400 firm (US$ 2,222 millions).

Figure 1 shows the volatility of returns for different countries included in our analysis and Figure 2 illustrates the monthly average return and dispersion[14] for ADRs and US stocks. From these figures, it may be noted that, the volatility of returns for the developed markets are relatively lower than the volatility for the developing markets. Further, ADR returns and dispersion have similar magnitude than major US Stocks. ADR's return and volatility is greater that than the ones for S&P500 but smaller than the ones for S&P400 and S&P600. Also, for the

[14] Weighted by Assets.

case of ADRs and S&P firms, size of the firm is inversely related to returns and dispersion. In addition, ADR volatility is almost half the volatility of Micro-Caps.

Table 2 presents the geographical and industry classification of the ADR sample. The region that has more participation is Other Europe (101 securities). For industrial classification, SIC codes from Compustat and the Kenneth French 12-industry classification were used. As can be seen, financial firms (11th group in French's Classification) are not included.

Table 3 shows the summary results of running CAPM-type regressions on each of the 357 ADRs. Model 1 refers to the equation (1) shown earlier in this paper. Model 2 refers to equation (3) and Model 3 to equation (4). For model 1, on average, the R-square is 0.35. It is not significantly different from its median (0.33). Model 2 and 3 provide a slight better fit (R-square about 0.39). From each regression, we get the Root Mean Square Error. The log of this variable is our indicator of idiosyncratic risk and will be used in our second stage. We computed three idiosyncratic risks per ADR (one for each Model).

Table 4 shows summary statistics for the idiosyncratic risks. For Model 1, the average of idiosyncratic risk is 0.083 (0.081 for Model 2 and 0.078 for Model 3). Surprisingly, these levels are lower than the ones observed for US firms (0.103 for S&P500 and 0.203 for US Micro Caps Stocks). How can we reconcile this difference? There are some possible explanations. First, it could be the effect of those thinly traded smaller ADRs that do not trade frequently (so their prices do not move and their returns are not volatile). It could artificially produce low volatility for ADRs. Our data, however, is monthly data that significantly reduces this effect. Also, the averages shown in Table 4 are value-weighted averages that make small stocks less important in the final result. Second, some ADR's idiosyncratic risks could be low because some of these stocks are very important in their small countries (they are a significant part of the index), hence, this would potentially generate a low regression error ('good fit') in CAPM-type regression. However, again, our results are value-weighted that minimize small-country effects. Also, in Table 4, we open our results per-country. Lower idiosyncratic risk is seen not only for Latin-American and Other Asian Countries (the smaller countries in our sample) but also for major industrialized countries such as UK, Japan, France and Germany. Third, US idiosyncratic risk could be lower because Value-Weighted Market Returns were used (in their CAPM-type regressions) instead of Equal-Weighted Market Return. We also tried using Equal-Weighted

Return for US equations (results not shown) and no significant changes were observed in our results. The level of ADR's Idiosyncratic Risk is closer to the S&P500 but lower than the other US firms (especially Micro Caps).

Table 5 presents the second stage of our procedure. It shows the results of cross-section regressions following equation (7)[15]. The dependent variable is the standard deviation of RMSE in logs. As described by Goyal and Santa-Clara (2001), it was also found that (related with volatility of returns) the log of the standard deviation is closer to being normally distributed than the variance themselves[16]. The results from our three Models are shown in this table. First, some industrial dummies are important in terms of explaining ADR's idiosyncratic risk (the dummy for Micro Caps Industries was not included in the regression). Specifically, Industries such as Consumer Durable, Manufacturing, Business Equipment, and Shops show lower idiosyncratic risk than other industries. The lowest of them (largest negative value) is Business Equipment (group 6). Second, assets[17] and all other accounting ratios show significant association with idiosyncratic risk (with the expected sign). Third, this risk is significantly associated with country dummies; it is positively related with Latin-American and 'Other Asian' firms and negatively related with Japan. These results are compared against the dummy for 'Other European' firms that were omitted from the regression. For robustness in the estimation of the parameters, Table 6 shows two tests for collinearity. As it can be seen there is no evidence of multicollinearity in our cross-section regressions.

A valid question that can be raised is whether the significant correlations observed among idiosyncratic risk and the variables mentioned above are observed only for ADRs, or is this also a characteristic shared by the US securities. In order to provide some insight, the same two-stage procedure was also applied for US Securities. First, the US idiosyncratic risks were estimated using CAPM-type regressions, including CRSP Value Weighted Return, two Fama-French Factors and MSCI World Return (net of US Returns), for each US stock based on monthly data for the same time period and same data restrictions as the ADR sample. The log of RMSE for each US stock was estimated. Then, in the second stage pooled regressions that include both US stocks and ADRs are estimated. Their estimated idiosyncratic risk was regressed on the different

[15] These are asset-weighted regressions to avoid potential bias from small ADRs discussed before.
[16] See Andersen, Bollerslev et al. (2001) for a related argument.
[17] To avoid collinearity created by the variable Size of the firm, we created a variable, named Asset, from the residuals of regressing Size (in logs) against the other variables in the model.

independent variables defined in the previous section plus dummies variables that would capture the additional effect of ADRs. If these dummies are statistically significant then ADRs would have different sensitivity to these variables than the US stocks.

Table 7 shows the comparison between US securities and ADRs (for asset-weighted regressions). Five different samples of US securities were used for this purpose: (1) the total universe of stocks in major stock exchanges, (2) S&P 500 stocks, (3) S&P400 stocks, (4) S&P600 and (5) Micro Caps. Table 7 provides the results for our regressions. First, there is no significant additional industrial effect for ADRs. Coefficients for ADR's dummies are only different from the US Micro Cap stocks. Second, there is no different sensitivity for fundamental accounting variables with the exception, again, of Micro-Caps. Third, the country effect indicated before is present. There is more risk (ceteris paribus) in Latin-America and Asian (except Japan) countries than other developed markets. Japanese firms appear to be less risky, consistent with the fact that the Japanese market is a developed market. In summary, ADR returns show similar sensitivity to fundamental variables (industrial dummies and accounting ratios) than US firms (with the exception of Micro-Cap firms). The question of whether this result is sensitive to the way we estimate idiosyncratic risk is addressed in the next table.

Table 8 shows a similar analysis as in Table 7. The difference is in the dependent variable. Table 8 uses a primitive version of risk as the dependent variable: the volatility of monthly returns (or Total Risk). Since the main explanatory component of Total Risk is the idiosyncratic risk and not market factors, using Total Risk as a dependent variable is one way of checking if the effect (observed in Table 7) is present. As can be seen, our previous results hold. Sensitivity of ADR risk to variables that denote their inner financial structure is the same as that of US firms.

7. Summary and Conclusions

This study examines various determinants of idiosyncratic risk from the perspective of undiversified ADR investors, managers holding options/ other option holders, and arbitrageurs. For ADRs, there exist corporate control differences because they may not have the same level of institutional monitoring and pricing compared to U.S. firms.

This study suggests that aggregate volatility may be important for understanding the risk and return relationships for a portfolio of stocks. But, because of the unique characteristics for

ADRs, idiosyncratic risks are equally relevant. Therefore, a two-stage regression model was estimated in order to isolate the determinants of idiosyncratic risk.

We conclude that idiosyncratic risk for ADRs is not higher, on average, than for US firms. This is observed even though foreign market returns are more volatile than US market returns. From the regression analysis, it can be concluded that ADRs riskiness does not display much variation in terms of leverage, performance, liquidity, and earnings variability when compared with US firms (with the exception of Micro Cap US Firms).

It seems to be that, for risk evaluation, the country where the firm is headquartered plays a significant role. In the case of some countries in Latin-America and Asia (except Japan), there is a positive relationship, and for Japan a negative relationship. For other countries, the factor that affected firm risk (except for the market) is the inner financial structure of the firm itself, rather than nationality. For some ADRs, country investment does not provide diversification.

Future research will focus on a proxy for country risk and the model will be extended to incorporate factors such as bond yields, bond risk and default risk.

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Figure 1
Volatility of Foreign Market Returns vs. US Returns

The sample covers the period from 1999:01 to 2005:06. The volatility of returns for different countries are calculated by taking the standard deviation of stock returns for the sample period.

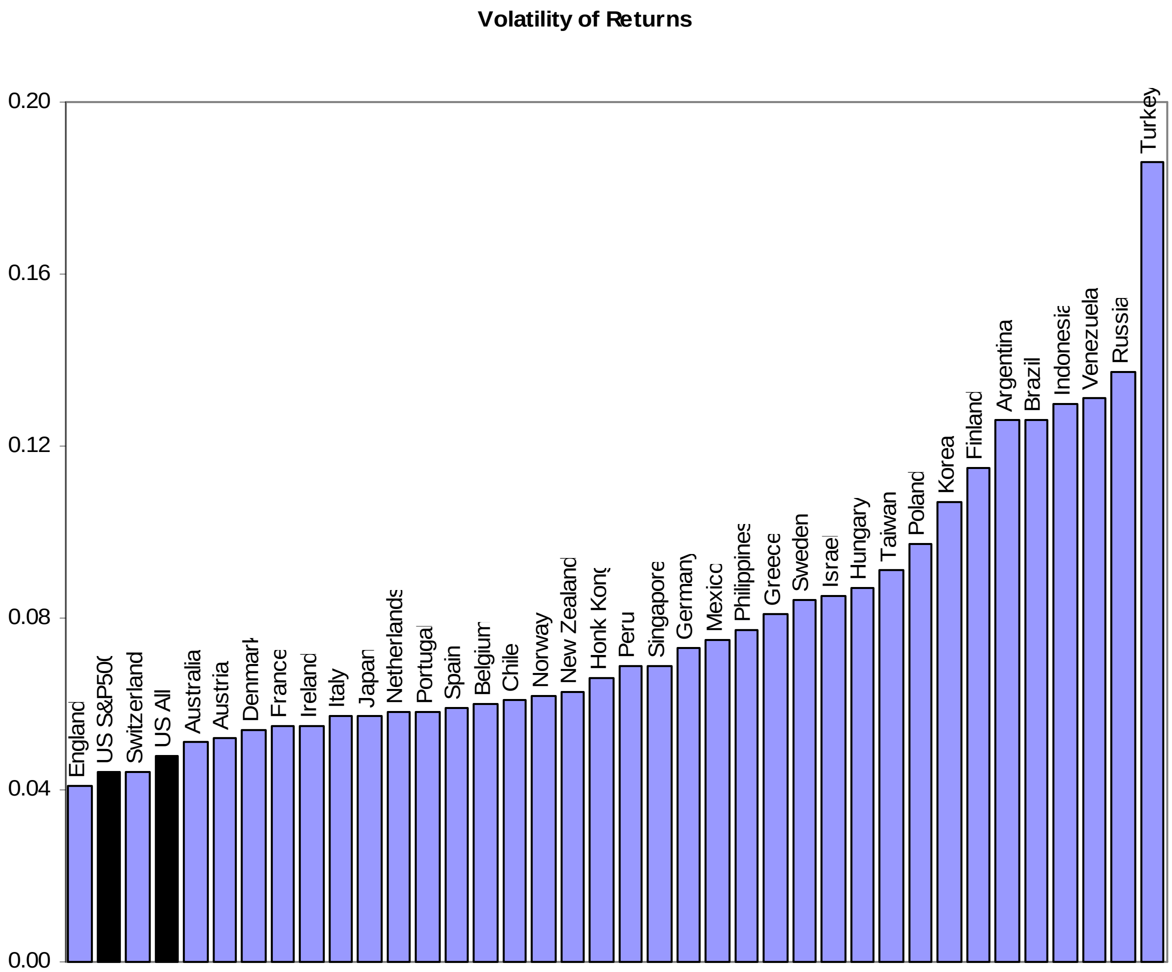
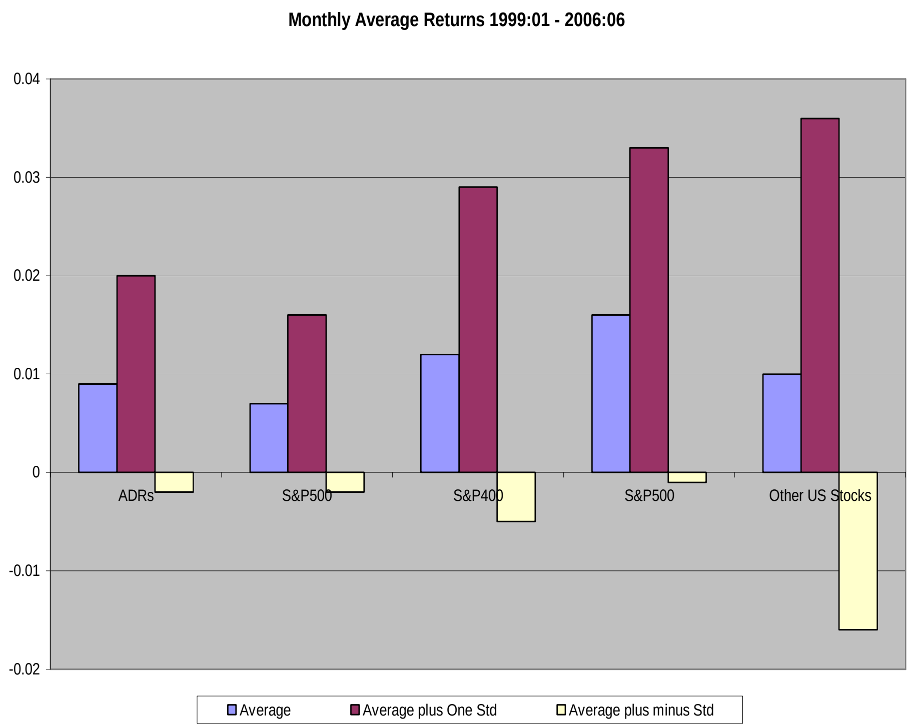


Figure 2
Comparing ADRs with US Securities: Average Monthly Returns and Their Dispersion
The sample covers the period from 1999:01 to 2005:06. A comparison is made using average returns and dispersions for ADRs versus stock indexes (S&P 500, S&P 400, S&P 600).



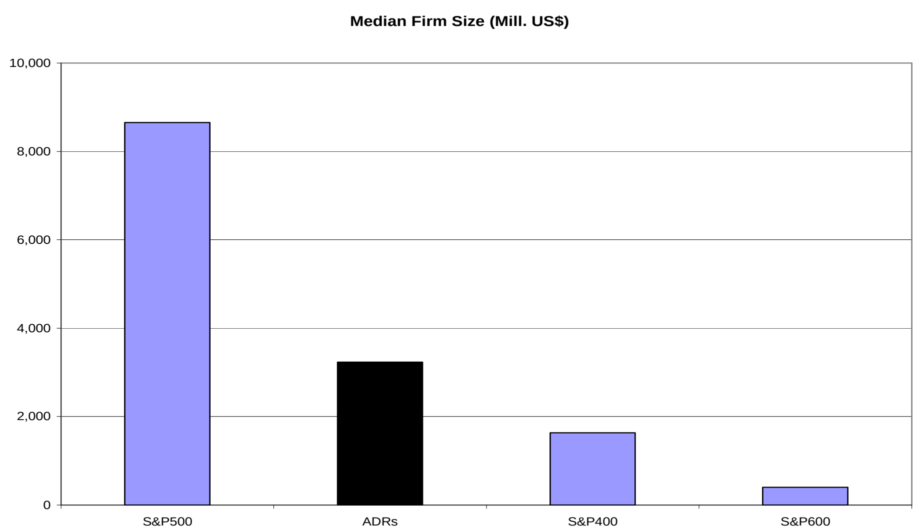


Table 1
ADR Sample

The sample includes those ADRs that trade in major stock exchanges. They must have both return data in CRSP (at least 24 months) and accounting data in Compustat (at least 3 years). Their countries must also have MSCI Total Return Indices. Financial firms are not included. The firm size is Total Assets. The sample covers the period from 1999:01 to 2005:06.

Country	Number of ADRs	Mean Size	Median Size
Argentina	7	4,819	5,581
Australia	12	3,765	565
Austria	1	9,805	9,805
Belgium	1	12,729	12,729
Brazil	9	12,945	6,157
Chile	15	2,944	934
Denmark	4	5,770	3,524
Finland	6	14,563	14,661
France	31	24,412	10,337
Greece	4	5,917	4,712
Honk Kong	7	10,364	5,786
Hungary	1	5,706	5,706
Indonesia	2	4,517	4,517
Ireland	12	2,273	344
Israel	10	1,714	675
Italy	11	31,036	3,552
Japan	30	32,316	14,539
Korea	6	22,855	18,555
Mexico	23	4,211	2,128
Netherlands	13	13,969	4,713
Norway	6	15,289	8,200
New Zealand	4	1,891	970
Philippines	2	3,346	3,346
Poland	1	910	910
Peru	2	1,665	1,665
Portugal	2	22,487	22,487
Russia	5	4,491	4,780
Singapore	2	2,681	2,681
Spain	5	42,104	45,786
Sweden	10	8,232	5,303
Switzerland	10	12,841	8,794
Turkey	1	4,361	4,361
Taiwan	4	9,770	9,562
England	78	14,874	3,097
Venezuela	2	2,901	2,901
Germany	18	28,820	5,611
All ADRs	357	14,968	3,763
S&P500	350	18,631	8,653
S&P400	295	2,222	1,635
S&P600	608	536	402
Other US Stocks	2649	390	85

Table 2
ADRs by Type of Industry and Geographical Region.

The Twelve Industry Classification are taken from the Kenneth French web site. The industry sectors are Consumer Non-Durables (f1), Consumer Durables (f2), Manufacturing (f3), Energy (f4), Chemicals (f5), Business Equipment (f6), Telecom (f7), Utilities (f8), Shops (f9), Health (f10), Finance (f11), and Other (f12). Financial firms (f11) are not included. The geographical dummies represented are UK (d1), France (d2), Germany (d3), Other Europe (d4), Japan (d5), Other Asia (d6) and Latin-America (d7).

REGION	NUMBER OF ADRs
UK	78
France	31
Germany	18
Other Europe	103
Japan	30
Other Asia	39
Latin-America	58
Total	357

INDUSTRY	NUMBER OF ADRS
Consumer Non-Durables	31
Consumer Durables	13
Manufacturing	40
Energy	18
Chemicals	12
Business Equipment	54
Telecom	67
Utilities	16
Shops	22
Health	36
Other	48
Total	357

Table 3
Contribution to ADR Variance

Return Variance is the sum of squares of firm returns (corrected by its mean). Mean Return Variance is the average among all regressions. Residual variance is the sum of squares of errors in each regression. Explained Variance is the Return Variance explained by the Market and Fama-French Factors.

Model 1 is:
RET = a1 + b1 * MKTF
Model 2 is:
RET = a1 + b1 * MKTF + c1*MKTUS
Model 3 is:
RET = a1 + b1 * MKTF + c1*MKTUS + d1*SMB+ d2*HML

	Model 1	Model 2	Model 3
Number of Regressions (N)	357	357	357
Mean R2	0.35	0.39	0.39
Median R2	0.33	0.38	0.38
Mean of Sum Squares Total (corrected)	0.887	0.887	0.887
Mean of Sum Squares Residuals	0.583	0.548	0.487
Mean of Sum Squares Model	0.304	0.339	0.400

Table 4
Root Mean Square Errors: ADRs and US Securities

The geographical Dummies represent UK, France, Germany, Other Europe, Japan, Other Asia, and Latin America. The twelve industry classifications are taken from the Kenneth French website. The sample covers the period from 1999:01 to 2005:06.

Root Mean Square Errors		Average	Std
ADR			
Model 1	All ADRs	0.083	0.040
	UK	0.082	0.040
	France	0.094	0.047
	Germany	0.079	0.026
	Other Europe	0.080	0.051
	Japan	0.080	0.021
	Other Asia	0.093	0.027
	Latin-America	0.086	0.043
Model 2	All ADRs	0.081	0.039
	UK	0.080	0.038
	France	0.092	0.047
	Germany	0.077	0.026
	Other Europe	0.078	0.049
	Japan	0.078	0.021
	Other Asia	0.089	0.024
	Latin-America	0.085	0.042
Model 3	All ADRs	0.078	0.037
	UK	0.078	0.038
	France	0.088	0.043
	Germany	0.070	0.023
	Other Europe	0.074	0.047
	Japan	0.075	0.020
	Other Asia	0.087	0.022
	Latin-America	0.084	0.042
S&P500 (Large Caps)		0.103	0.049
S&P400 (Medium Caps)		0.122	0.054
S&P600 (Small Caps)		0.150	0.068
Other US Stocks (Micro Caps)		0.208	0.105

Table 5
Determinants of ADRs Idiosyncratic Risk.

The sample covers the period from 1999:01 to 2005:06. Idiosyncratic risk was calculated from the model that included as explanatory variables: Foreign Market Return, US Market Return and two Fama-French Factors (SMB and HML). The Standard Deviations of errors (in logs, one per each of the 350 estimations) are regressed (cross section) against ten industry dummies (f1-f10) created using the Kenneth French Classification, average of Total Assets (in logs), the averages of three accounting ratios (Leverage, Performance, and Firm Liquidity as defined in the document) , the standard deviation of Earnings, and six geographical dummies. The industry sectors are Consumer Non-Durables (f1), Consumer Durables (f2), Manufacturing (f3), Energy (f4), Chemicals (f5), Business Equipment (f6), Telecom (f7), Utilities (f8), Shops (f9), Health (f10), Finance (f11), and Other (f12). Financial firms (f11) are not included. The geographical dummies are UK (d1), France (d2), Germany (d3), Other Europe (d4), Japan (d5), Other Asia (d6) and Latin-America (d7).

	Model 1		Model 2		Model 3	
	Parameter	p-value	Parameter	p-value	Parameter	p-value
Intercept	-2.341	0.000	-2.372	0.000	-2.398	0.000
f1	-0.222	0.019	-0.240	0.012	-0.249	0.008
f2	-0.364	0.000	-0.365	0.000	-0.364	0.000
f3	-0.390	0.000	-0.390	0.000	-0.354	0.001
f4	0.124	0.113	0.117	0.138	0.104	0.176
f5	0.054	0.387	0.030	0.633	-0.008	0.901
f6	-0.555	0.000	-0.555	0.000	-0.552	0.000
f7	-0.010	0.915	-0.001	0.990	0.001	0.988
f8	-0.124	0.187	-0.153	0.107	-0.145	0.117
f9	-0.236	0.001	-0.252	0.001	-0.256	0.000
f10	0.027	0.706	0.029	0.689	0.033	0.639
assets	-0.136	0.000	-0.135	0.000	-0.140	0.000
leverage	0.256	0.012	0.294	0.004	0.288	0.004
performance	-2.849	0.000	-2.836	0.000	-2.883	0.000
liquidity	0.687	0.004	0.540	0.023	0.594	0.011
earnings	1.150	0.003	1.212	0.002	1.183	0.002
d1	0.137	0.003	0.147	0.001	0.165	0.000
d2	0.109	0.024	0.109	0.025	0.130	0.006
d3	0.032	0.607	0.036	0.562	-0.004	0.941
d5	-0.226	0.000	-0.225	0.000	-0.221	0.000
d6	0.255	0.000	0.256	0.000	0.285	0.000
d7	0.196	0.005	0.210	0.003	0.239	0.000
Adj. R2	0.54		0.53		0.54	

Table 6
Multicollinearity Tests

Two different multicollinearity tests are conducted for the variables created using the Kenneth French Classification, namely, average of Total Assets (in logs), the average of three accounting ratios (Leverage, Performance, Firm Liquidity), the standard deviation of Earnings, and six geographical dummies. The industry sectors are Consumer Non-Durables (f1), Consumer Durables (f2), Manufacturing (f3), Energy (f4), Chemicals (f5), Business Equipment (f6), Telecom (f7), Utilities (f8), Shops (f9), Health (f10), Finance (f11), and Other (f12). The sample covers the period from 1999:01 to 2005:06.

A. Variance Inflation			
Variable	Model 1	Model 2	Model 3
f1	1.63	1.63	1.66
f2	3.15	3.15	1.43
f3	1.61	1.61	1.30
f4	2.17	2.17	2.53
f5	4.04	4.04	2.21
f6	2.51	2.51	1.40
f7	1.49	1.49	1.48
f8	2.10	2.10	2.02
f9	2.79	2.79	1.98
f10	2.51	2.51	1.34
assets	0.67	1.50	1.00
leverage	1.54	1.54	1.51
performance	1.77	1.77	2.62
liquidity	1.52	1.52	2.03
earnings	1.23	1.23	2.59
d1	1.77	1.77	1.56
d2	1.49	1.49	1.28
d3	1.64	1.64	1.16
d5	2.07	2.07	1.32
d6	1.30	1.30	1.30
d7	1.22	1.22	1.48

B. Condition Index			
	Model 1	Model 2	Model 3
Number			
1	1.00	1.00	1.00
2	1.90	1.90	1.55
3	2.04	2.04	1.81
4	2.23	2.23	1.96
5	2.27	2.27	2.00
6	2.30	2.30	2.02
7	2.40	2.40	2.06
8	2.42	2.42	2.12
9	2.47	2.47	2.13
10	2.47	2.47	2.13
11	2.56	2.56	2.13
12	2.57	2.57	2.18
13	2.73	2.73	2.26
14	3.23	3.23	2.31
15	3.37	3.37	2.36
16	4.08	4.08	2.50
17	4.97	4.97	2.74
18	5.13	5.13	4.34
19	5.59	5.59	4.36
20	7.03	7.03	5.53
21	11.01	11.01	6.85
22	21.56	21.56	13.13

Table 7
Comparison against US Idiosyncratic Risk

The sample covers the period from 1999:01 to 2005:06. The dependent variable is the Root Mean Square Error for each firm (in logs). They are regressed (weighted by the firm Total Asset, cross-section regressions) against ten industry dummies (f1-f10) created using the Kenneth French Classification, as in Table 6. The industry sectors are also consistent with Table 6; however, financial firms (f11) are not included in this table.

	ALL US		**S&P500**		**S&P400**		**S&P600**		**Other US**	
Variable	**Estimate**	**p**	**Estimate**	**p**	**Estimate**	**p**	**Estimate**	**p**	**Estimate**	**p**
Intercept	-2.223	<.0001	-2.174	<.0001	-2.517	<.0001	-2.474	<.0001	-2.220	<.0001
f1	0.018	0.506	0.053	0.460	-0.099	0.494	0.046	0.756	-0.029	0.630
f2	-0.092	0.001	-0.255	0.000	0.076	0.658	0.137	0.447	0.083	0.276
f3	-0.116	0.001	-0.131	0.102	0.043	0.778	-0.110	0.668	-0.022	0.834
f4	0.246	<.0001	0.142	0.028	0.255	0.066	0.205	0.136	0.411	<.0001
f5	0.102	<.0001	0.091	0.104	-0.040	0.851	-0.026	0.954	0.078	0.133
f6	-0.359	<.0001	-0.308	<.0001	-0.554	<.0001	-0.624	<.0001	0.009	0.927
f7	0.157	<.0001	0.146	0.017	0.260	0.054	0.170	0.134	0.158	0.008
f8	0.103	0.000	0.044	0.553	0.247	0.162	0.246	0.116	0.264	0.001
f9	0.045	0.037	-0.011	0.845	0.063	0.585	0.100	0.398	0.151	0.003
f10	0.160	<.0001	0.140	0.036	0.183	0.291	-0.011	0.960	0.227	0.032
assets	-0.118	<.0001	-0.116	<.0001	-0.033	0.549	-0.061	0.329	-0.115	<.0001
leverage	0.368	<.0001	0.285	0.005	0.457	0.032	0.618	0.009	0.463	<.0001
performance	-1.678	<.0001	-2.203	<.0001	-1.803	0.028	-1.507	0.011	-1.698	<.0001
liquidity	0.628	<.0001	1.010	<.0001	0.289	0.499	0.393	0.283	0.032	0.753
earnings	1.180	<.0001	2.902	<.0001	4.483	0.000	2.521	0.008	0.392	0.039
a_f1	-0.240	<.0001	-0.275	0.024	-0.123	0.453	-0.268	0.094	-0.192	0.007
a_f2	-0.272	<.0001	-0.109	0.293	-0.440	0.016	-0.501	0.007	-0.446	<.0001
a_f3	-0.274	<.0001	-0.259	0.055	-0.434	0.014	-0.280	0.292	-0.368	0.001
a_f4	-0.122	0.010	-0.017	0.867	-0.131	0.391	-0.081	0.578	-0.287	<.0001
a_f5	-0.049	0.212	-0.038	0.659	0.093	0.667	0.080	0.860	-0.024	0.674
a_f6	-0.195	<.0001	-0.246	0.014	0.000	0.998	0.069	0.665	-0.563	<.0001
a_f7	-0.167	0.002	-0.156	0.179	-0.270	0.080	-0.180	0.160	-0.168	0.018
a_f8	-0.228	<.0001	-0.168	0.171	-0.372	0.054	-0.371	0.027	-0.388	<.0001
a_f9	-0.281	<.0001	-0.225	0.018	-0.299	0.022	-0.336	0.008	-0.387	<.0001
a_f10	-0.132	0.003	-0.113	0.262	-0.156	0.394	0.038	0.861	-0.200	0.068
a_assets	-0.018	0.045	-0.020	0.341	-0.103	0.071	-0.075	0.234	-0.021	0.044
a_leverage	-0.112	0.071	-0.030	0.839	-0.201	0.378	-0.362	0.139	-0.207	0.002
a_performance	-1.171	<.0001	-0.646	0.158	-1.046	0.221	-1.342	0.031	-1.151	<.0001
a_liquidity	0.059	0.666	-0.324	0.321	0.398	0.394	0.293	0.459	0.654	<.0001
a_earnings	-0.029	0.907	-1.752	0.019	-3.333	0.010	-1.371	0.159	0.758	0.002
d1	0.137	<.0001	0.137	0.004	0.137	0.000	0.137	<.0001	0.137	<.0001
d2	0.109	<.0001	0.109	0.030	0.109	0.005	0.109	0.000	0.109	<.0001
d3	0.032	0.311	0.032	0.621	0.032	0.520	0.032	0.413	0.032	0.202
d5	-0.226	<.0001	-0.226	<.0001	-0.226	<.0001	-0.226	<.0001	-0.226	<.0001
d6	0.255	<.0001	0.255	0.000	0.255	<.0001	0.255	<.0001	0.255	<.0001
d7	0.196	<.0001	0.196	0.006	0.196	0.000	0.196	<.0001	0.196	<.0001
adr	-0.118	0.062	-0.168	0.275	0.176	0.532	0.132	0.557	-0.121	0.102
Adj. R2	0.56		0.53		0.56		0.58		0.65	

Table 8
Gross Volatility of Monthly Returns

A robustness check using the most general definition of volatility, i.e., the simple (mean) of the standard deviation of monthly returns. The dependent variable below is Σ sqrt $(\sigma^2(r_{jt})/N)$ in logs calculated per each US stock and ADR .

Variables	All US Estimate	p	S&P500 Estimate	p	S&P400 Estimate	p	S&P600 Estimate	p	Other Estimate	p
Intercept	-2.08	0.00	-2.02	0.00	-2.36	0.00	-2.35	0.00	-2.16	0.00
f1	-0.09	0.00	-0.07	0.32	-0.20	0.14	-0.02	0.90	-0.13	0.02
f2	-0.15	0.00	-0.33	0.00	0.01	0.97	0.07	0.66	0.03	0.72
f3	-0.15	0.00	-0.17	0.02	0.01	0.95	-0.08	0.74	-0.09	0.36
f4	0.24	0.00	0.13	0.04	0.26	0.05	0.20	0.10	0.43	0.00
f5	0.03	0.11	-0.01	0.86	-0.02	0.91	-0.06	0.89	0.12	0.02
f6	-0.36	0.00	-0.31	0.00	-0.58	0.00	-0.59	0.00	0.05	0.54
f7	0.09	0.00	0.07	0.25	0.22	0.08	0.14	0.18	0.12	0.04
f8	-0.01	0.64	-0.09	0.21	0.15	0.37	0.17	0.22	0.23	0.00
f9	0.05	0.03	0.01	0.92	0.01	0.94	0.06	0.61	0.12	0.01
f10	0.12	0.00	0.10	0.13	0.16	0.31	0.00	0.99	0.20	0.04
assets	-0.09	0.00	-0.09	0.00	-0.02	0.75	-0.02	0.68	-0.08	0.00
leverage	0.32	0.00	0.20	0.03	0.44	0.03	0.57	0.01	0.47	0.00
performance	-1.83	0.00	-2.35	0.00	-1.86	0.01	-1.47	0.01	-1.60	0.00
liquidity	0.76	0.00	1.05	0.00	0.42	0.29	0.52	0.12	0.27	0.01
earnings	1.12	0.00	3.19	0.00	4.10	0.00	2.54	0.00	0.38	0.03
a_f1	-0.16	0.00	-0.19	0.11	-0.06	0.69	-0.24	0.10	-0.12	0.07
a_f2	-0.13	0.00	0.04	0.65	-0.29	0.09	-0.36	0.04	-0.31	0.00
a_f3	0.03	0.59	0.05	0.70	-0.13	0.42	-0.04	0.86	-0.03	0.77
a_f4	0.03	0.48	0.14	0.14	0.01	0.92	0.07	0.63	-0.16	0.02
a_f5	0.09	0.02	0.14	0.10	0.15	0.46	0.18	0.66	0.01	0.86
a_f6	-0.04	0.41	-0.08	0.38	0.18	0.19	0.20	0.17	-0.45	0.00
a_f7	-0.05	0.34	-0.03	0.80	-0.18	0.21	-0.10	0.39	-0.08	0.24
a_f8	-0.25	0.00	-0.18	0.13	-0.41	0.02	-0.44	0.00	-0.50	0.00
a_f9	-0.18	0.00	-0.14	0.13	-0.14	0.24	-0.19	0.11	-0.26	0.00
a_f10	-0.09	0.03	-0.07	0.43	-0.14	0.40	0.02	0.93	-0.18	0.08
a_assets	0.00	0.80	0.00	0.86	-0.07	0.17	-0.07	0.26	-0.01	0.36
a_leverage	0.03	0.64	0.14	0.30	-0.09	0.66	-0.23	0.31	-0.12	0.06
a_performance	-0.34	0.05	0.18	0.68	-0.31	0.69	-0.70	0.22	-0.58	0.00
a_liquidity	0.37	0.00	0.09	0.78	0.72	0.10	0.61	0.09	0.87	0.00
a_earnings	-0.48	0.05	-2.54	0.00	-3.46	0.00	-1.89	0.03	0.26	0.25
d1	0.03	0.15	0.03	0.47	0.03	0.34	0.03	0.22	0.03	0.06
d2	0.11	0.00	0.11	0.02	0.11	0.00	0.11	0.00	0.11	0.00
d3	0.03	0.29	0.03	0.60	0.03	0.49	0.03	0.37	0.03	0.18
d5	-0.23	0.00	-0.23	0.00	-0.23	0.00	-0.23	0.00	-0.23	0.00
d6	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.00
d7	0.36	0.00	0.36	0.00	0.36	0.00	0.36	0.00	0.36	0.00
adr	-0.28	0.00	-0.34	0.02	0.00	1.00	-0.01	0.97	-0.20	0.00
Adj. R2	0.56		0.55		0.58		0.60		0.65	