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In International and Global Indexes**

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ADR Characteristics and Performance

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Abstract

This study looks at the characteristics and performance of ADRs in international and global indexes. We find that ADRs in EAFE are tilted toward three common factors: giant cap, high dividend yield, and U.K. stocks. In terms of risk-adjusted performance, we find that ADRs provide inefficient diversification for US investors, as tradeoffs of return and risk are better with portfolio combinations of the S&P500 and the S&P Global 700, as compared with portfolio combinations of the S&P500 and an ADR breakout of the Global 700. Our findings on ADR characteristics are consistent with prior research, while our performance findings are inconsistent with prior research which points to ADR portfolio efficiency.

Investors use American Depository Receipts (ADRs) as a practical vehicle to achieve cost-efficient exposure to stocks of companies domiciled in non-U.S. markets. As such, ADRs are employed by index providers in the construction of international and global indexes such as EAFE (Europe, Australasia, and the Far East) and the S&P Global 1200 and Global 700 indexes, respectively. In this study, we examine the characteristics and performance of ADRs relative to non-ADR components of companies that populate these widely-used international indexes. A better understanding of ADR characteristics can be used by portfolio managers to assess whether globally-based portfolios are factor neutral or factor biased; while a better understanding of the return and risk characteristics of ADRs in the index construction can be used by managers to assess the performance benefit (or possible lack thereof) of using ADRs in the development of globally efficient portfolios.

ADR Background and Literature Review

Exchanges in the US have attracted their fair share of cross-listed firms. Cross listings in the US exchanges peaked in 1996, coinciding with the IPO boom. In spite of weakening of this trend brought about by the market downturn at the beginning of this decade and regulatory changes that have made listings in the US less attractive (see, Zhu and Small [2007]), cross-listed firms continue to be an important part of US exchanges. According to the World Federation of Exchange members, in May 2007, out of the 2290 firms that were listed on the NYSE, 443 (19.34%) were foreign companies. In the NASDAQ market, 322 firms out of 3113 firms (10.34%) were foreign companies.

As companies have become more international in their orientation, the cross listing of firms on different international exchanges has been popular for many reasons. By listing on international exchanges, firms increase the amount and the quality of information that they provide to investors. This generally results in greater access to capital at lower cost and greater liquidity (see Chouinard and D'Souza [2004] and Reese and Weisbach [2002] for detailed studies).

A popular way to list firms on international exchanges has been through Global Depository Receipts. Such instruments in the US are called American Depository Receipts (ADR) (see Karolyi [2005] for a comprehensive survey of new and old trends in the market for ADRs and new research initiatives in this area). J.P. Morgan first introduced them in 1927, in response to the difficulty of buying shares from other countries that trade at different prices and currency values. An ADR is a stock that trades in the US just like regular stocks. They are issued in the US by a bank or a brokerage firm (depository) but represent a specified number of shares in a foreign corporation. The bank purchases a large lot of shares from a foreign company, bundles the shares into groups and reissues them on one of the US exchanges.¹ A ratio of the ADR per home country share is set by the bank; for example, a ratio of 6:1 implies that one ADR share represents six shares in the foreign company.

The company whose shares it represents usually sponsors an ADR. There can be three levels of sponsorship.² A Level I sponsored ADR is created by the company to expand the market for its securities to the US, but without needing to register with the SEC, or conforming to US GAAP. Institutional investors trade such an ADR in the OTC

Bulletin Board or Pink Sheets trading systems. Level II and III ADRs can be listed on exchanges. Level II and Level III sponsored ADRs must register with the SEC and financial statements must be reconciled to US GAAP (or now IFRS as accepted by IASB³). A Level III sponsorship is required, if the ADR is a primary offering and is used to raise capital for the company.

From a portfolio management perspective, cross-listed foreign companies allow investors to take advantage of international diversification without having to trade in a foreign market. The benefits of international diversification have been the focus of many important studies. In a seminal paper, Grauer and Hakansson [1987] examine the benefits of international diversification using the returns of portfolios of bonds and stocks and find that the gains from using non-US asset categories are very large. De Santis and Gerard [1997] find that expected gains from international diversification for a US investor have averaged 2.11% per year and had not declined during the sample period of their study. More recently, Chiou [2007] and Driessen and Luc Laeven [2007] examine the benefits of international diversification from the point of view of investors located in different parts of the world. Results generally indicate that the benefits from investing abroad are large. This is especially true for investors in developing countries, and those who are located in high country risk nations.

Aggarwal, Dahiya and Klapper [2007] find that ADRs are the preferred mode of holdings rather than the underlying stock of US listed foreign firms if the local market of the issuer has weak investor protection, low liquidity and high transaction costs.

Callaghan, Kleiman and Sahu [1996] study the investment characteristics of ADRs. They

find that ADRs have lower P/E multiples, higher dividend yields, and lower market-to-book ratios than international benchmarks, as measured by the Morgan Stanley Capital International Perspective (MSCIP). In addition, there are significant differences in country and industry representations between the ADR sample and the world market portfolio. Also, ADRs provide a higher monthly return and a higher standard deviation than the MSCIP, but offer greater return per unit of risk than the index. Both the ADR sample and the MSCIP have lower betas than the S&P 500 and they conclude that ADRs should receive a significant weighting in the portfolios of internationally diversified investors. Kabir, Hassan and Maroney [2005] study international diversification using ADRs. They find diversification benefits from ADR's especially when combined with various country indexes.

This paper extends prior research, by examining the characteristics and performance of ADRs in international and global indexes. The study assesses common factors of ADR's, which are part of EAFE. In addition, the paper analyzes the role of ADRs as a stand-alone portfolio in risk-return space and their role as an international diversifier for U.S investors. We find that ADRs in EAFE are tilted toward three common factors: giant cap, high dividend yield, and U.K. stocks. This finding is consistent with earlier research on ADR characteristics reported by Callaghan, Kleiman and Sahu [1996]. In contrast to prior studies, we find that over the January 1998 to June 2007 period, ADRs as a portfolio outperformed the S&P500, *but* they underperformed the S&P Global 700; which consists of a diversified mix of ADRs and non-ADRs. Moreover, we find that portfolio combinations of ADRs and the S&P500 provide

inefficient diversification when compared to the risk-adjusted returns of US equities and the Global 700.

Characteristics and Performance of ADRs

In the following sections we examine the characteristics and performance of ADRs in international indexes. In the next section, we look at the characteristics of ADRs in the EAFE index; specifically, we look at ADRs in terms of several common factors. These ADR factors or “buckets” include country composition, sector, size (market cap), beta, price multiples, and dividend yield. Following that, we examine the absolute and risk-adjusted returns of ADRs in the context of an efficient frontier analysis of U.S. and international equities (measured by the S&P500 and S&P Global 700) versus portfolio combinations of U.S. equities and ADRs (measured by S&P500 and an ADR breakout of the Global 700).

Characteristics of ADRs in International Indexes

ADRs by Country Buckets

Exhibit 1 displays the percentages of ADRs-to-non-ADRs in EAFE by country buckets as of December 29, 2006.⁴ On balance, ADRs make up some 60% of stocks in the EAFE index (not shown). At 81%, we see that the United Kingdom has the highest ADR-to-non-ADR ratio in EAFE by country. The second highest ADR ratio lies in two other Western European countries, France and Netherlands, both at 71%. Spain, Hong Kong, and Germany have the next highest ADR country ratios at 69%, 68%, and 65%, respectively. In contrast, Singapore, at 30%, has the lowest ADR-to-non-ADR ratio in

EAFE, while other countries with low ADR ratios include New Zealand, at 33%, Australia and Sweden, both at 34%, and Belgium at 35%.

ADRs by Sector Buckets

Exhibit 2 displays the percentages of ADRs-to-non-ADRs in EAFE by sector buckets. The usual ten sectors are shown, including consumer discretionary, consumer staples, energy, financials, health care, industrials, information technology, materials, telecommunication services, and utilities. Energy, at 92%, has the highest ADR-to-non-ADR ratio in EAFE by sectors. Telecommunication services are a close second, having an ADR-to-non-ADR ratio of 87%. Information technology, at 68%, is also relatively high given that ADRs make up about 60% of EAFE. On the other hand, industrials and consumer staples, at 35% and 46%, have the lowest ADR-to-non-ADR sector ratios in EAFE. Consumer discretionary and materials, at 54% and 56%, rank next; while financials and health care have ADR sector ratios that are typical of EAFE (at 60%). Regarding value-vs.-growth sectors, it appears that the ADR-based sector composition in EAFE is equity style neutral; with energy representing a value style sector, and telecommunication services and information technology representing growth style sectors.

ADRs by Size Buckets

Exhibit 3 displays the percentages of ADRs-to-non-ADRs in EAFE by size buckets (actually quintiles, as of December 29, 2006). The five market-cap buckets include Q1 for large cap-to-giant cap stocks at \$17.4 to \$229 billion, Q2 for large cap

stocks with market caps exceeding \$7.8 billion (up to \$17.4 billion), Q3 for mid-cap-to-large cap stocks with market caps exceeding \$4.2 billion, Q4 for mid-caps having market caps greater than \$2.4 billion, and Q5 for small-to-mid-cap stocks with market caps exceeding \$0.39 billion (up to \$2.4 billion). As shown, the ADR-to-non-ADR ratios by size quintile are clearly tilted toward large-to-giant cap stocks. Specifically, ADRs make up some 73% of stocks in EAFE-Q1 with market caps exceeding \$17.4 billion. In EAFE-Q2, for large caps, ADRs make up some 45% of stocks, while in EAFE-Q3, for mid-to-large caps, ADRs make up 20%. In EAFE-Q4, the mid cap arena, ADRs make up 16% of EAFE stocks, while in EAFE-Q5, the small cap bucket, the ADR-to-non-ADR ratio in EAFE is only 3%.

ADRs by Beta Buckets

Exhibit 4 displays the percentages of ADRs-to-non-ADRs in EAFE by beta buckets (again, quintiles). These beta buckets consist of the following: Q1 with betas less than 0.5, Q2 with betas 0.5 to 0.7, Q3 with betas 0.7 to 1.0 (market beta), Q4 with betas 1.0 to 1.3, and Q5 with betas higher than 1.3. Conventional wisdom suggests that stocks with betas higher than 1.0-such as information technology stocks-represent “growth” stocks, while stocks with betas less than unity-such as certain segments of health care-are typical of “value” stocks. Stocks with betas of unity have average market risk. As of December 29, 2006, EAFE seems factor neutral with respect to the beta composition of ADRs vs. non-ADRs. For example, the ratio of ADRs-to-non-ADRs by beta buckets in Q4 and Q5 are 65% and 63%, while the composition of ADR betas in Q2 and Q3 are at or near 60% (60% for Q3 and 57% for Q2). That being said, there exists a slight tilt

toward relatively high ADR betas with Q5 having an ADR beta composition of 65%, while Q1 with low ADR betas (less than 0.5) makes up only 53% of EAFE stocks in this relative risk bucket.

ADRs by Price-to-Book Buckets

Exhibit 5 displays the percentages of ADRs-to-non-ADRs in EAFE by price-to-book buckets. These price-to-book quintiles consist of the following: Q1 at 0.5 to 1.6 for relatively low price/book stocks, Q2 at 1.6 to 2.2 for moderate price/book stocks, Q3 at 2.2 to 3.0 for average price/book stocks (or middle of the road stocks), Q4 at 3.0 to 4.7 for moderately high price/book stocks, and Q5 for high price book stocks (price/book ratio greater than 4.7). At 65%, the ratio of ADRs-to-non-ADRs by price/book buckets is highest in Q2, the moderately low price-to-book ratio bucket as of December 29, 2006. There does not appear to be a tilt either to stocks with unusually low price-book ratios or high price-to-book ratios as the ADR-to-non-ADR ratios for these quintiles are 55% and 54% respectively. Moreover, the composition of ADRs in the average-to-moderately high price/book buckets, Q3 and Q4, are near 60%. Given that stocks with low price-to-book ratios are typical of “value” stocks, it appears that the concentration of value-oriented ADRs in Q2, at 65%, represent a more conservative form of value style investing (such as the high dividend-yield ADRs shown next), as compared with the unusually low price-book ADRs in Q1, at 55%, which likely represent the stocks of risky, troubled companies.

ADRs by Dividend Yield Buckets

In turn, Exhibit 6 displays the percentages of ADRs-to-non-ADRs in EAFE by dividend yield buckets. These yield buckets consist of the following: Q1 at 0.0% to 0.8% for zero-to-low dividend yield stocks, Q2 at 0.8% to 1.4% for moderately-low yield stocks, Q3 at 1.4% to 2.1% for average (or middle of the road) yield stocks, Q4 at 2.1% to 3.2% for moderately-high yield stocks, and Q5 with yields greater than 3.2% for high-dividend yield stocks. As shown, the composition of ADRs in EAFE is clearly tilted toward high dividend yield stocks. This is evidenced in Q5, the high yield quintile, where the ADR-to-non-ADR ratio is 75%. Alternatively, in Q1 and Q2, spanning zero-to-moderately low dividend yield stocks, the ADR ratios are only 45% and 52%; while in Q3, the ADR composition by dividend yield is 51%. Taken together, the characteristics of ADRs in EAFE, as reported in Exhibits 1-6, reveal that ADRs in EAFE are tilted toward three common factors: giant-cap, high dividend yield, and U.K (or at least Western European) stocks.

Performance of ADRs in Global Indexes

We now investigate the performance of ADRs versus other diversified portfolio opportunities during January 1998 to June 2007. We'll look at the return and risk characteristics of ADRs in the S&P Global 700 versus other portfolios including the S&P Global 1200 (ADRs and non-ADRs), the Global 700 (G1200 *ex* S&P500), and the S&P500. We will discuss the performance and risk aspects of ADRs from the perspective of a U.S. investor.

ADRs by Absolute Return

Exhibit 7 shows the average monthly return on ADRs versus other well-known portfolio opportunities during the nine and one-half year sample period. The exhibit shows that the ADR portfolio underperformed (slightly) the more diversified Global 700 index. The average monthly returns on the two international portfolios were 0.907% and 0.933% respectively. Not surprisingly, the Global 1200 underperformed both of these return indexes as this portfolio consists of a diversified mix of Global 700 and the S&P500. In this context, the Global 1200 had an average monthly return of 0.754%, while the S&P500 had a return of 0.610%.

On a portfolio risk scale, it is interesting to note that the standard deviation of return on ADRs, at 4.77%, is higher than the comparable risk measure on the Global 700, at 4.38%. On a downside risk comparison, ADRs had the lowest monthly return, at -16.97%, compared with the minimum return observed on Global 700, at -12.33%. On the upside, the maximum monthly return on the ADR portfolio, at 11.55%, was slightly higher than the Global 700, at 11.34%. These portfolio return and risk findings suggest that ADRs provide investors with relatively lower absolute returns and higher risk. Comparatively speaking, this suggests that the reported ADR tilt (Exhibits 1, 3 and 6) in global index construction toward giant-cap, high-dividend yield and U.K. stocks does not provide U.S investors (as a portfolio opportunity) with sufficiently high enough reward to justify the extra risk.

ADRs as Stand-Alone Portfolio

We now show how ADRs measure up as a “stand-alone” portfolio. In this context Exhibit 8 shows the coefficient of variation (CV) for the four diversified portfolio opportunities-again, S&P ADRs, Global 700, Global 1200, and the S&P500. At 5.26, the exhibit shows that the ADR portfolio has a higher CV (risk/reward ratio) than the broader Global 700, at 4.69. This happens because the reward (average monthly return) on Global 700 is not only higher than the average reward on ADRs, but the risk (measured by return standard deviation) on the former portfolio is lower. Alternatively, the Global 700 has a higher reward-to-risk ratio ($1/CV$) when compared to the ADR portfolio. Exhibit 8 does suggest that international diversification is prudent for U.S. investors; because at 7.06, the S&P500 has the highest risk per reward unit among the four portfolio opportunities. One question that remains is whether a US investor is better off with a portfolio of US equities and ADRs, or a more diversified mix of US equities and the Global 700 (which consists of ADRs and non-ADRs).

ADRs as International Diversifier

Exhibit 9 shows a display of two efficient frontiers. These portfolio frontiers can be used to address the more fundamental question of whether ADRs provide efficient *or* inefficient diversification for U.S. investors. One of the frontiers shows a diversified mix of U.S. equities, as measured by the S&P500 and the Global 700, while the other frontier shows a diversified mix of U.S. equities and ADRs. On a comparative basis, the efficient frontier analysis shows that diversification with ADRs provides inefficient diversification for U.S. investors. This is because the risk-adjusted portfolio returns are everywhere

better with combinations of the S&P500 and Global 700, as compared with portfolio combinations of the S&P500 and ADRs. Not surprisingly, this results because the return correlation between the S&P500 and Global 700, at 0.84, is lower than the rate of return correlation between the S&P500 and the ADR portfolio, at 0.89. Moreover, given our findings on ADR characteristics, it would appear that ADRs are an inefficient diversifier for U.S. investors because of the tilt toward giant-cap, high dividend yield, and stocks of the United Kingdom.

Summary

This study looks at the characteristics and performance of ADRs in international and global indexes. As of December 29, 2006, we find that the ADR composition of EAFE is tilted on a countrywide basis to the common stocks of the United Kingdom (or at least Western European stocks on a regional basis). Consistent with earlier research, the ADR tilt in EAFE is *non*-factor neutral with respect to size and dividend yield, as it is biased toward giant cap and high-dividend yield companies. Taken together, it appears that the ADR composition of EAFE is biased toward giant-cap, high dividend yield stocks of the United Kingdom.

In terms of risk-adjusted performance, we find that ADRs provide inefficient diversification opportunities for US investors. In this context, we find that portfolio tradeoffs of return versus risk are better with portfolio combinations of the S&P500 and the S&P Global 700, as compared with portfolio combinations of the S&P500 and the ADR breakout of the Global 700. While these performance and risk findings are robust over the January 1998 to June 2007 period, we realize that empirical analysis over a

longer time period is warranted, especially in light of prior research which points to ADR portfolio efficiency.

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Exhibit 1
% Composition of ADRs (vs. Non-ADRs)
by Country Buckets in EAFE

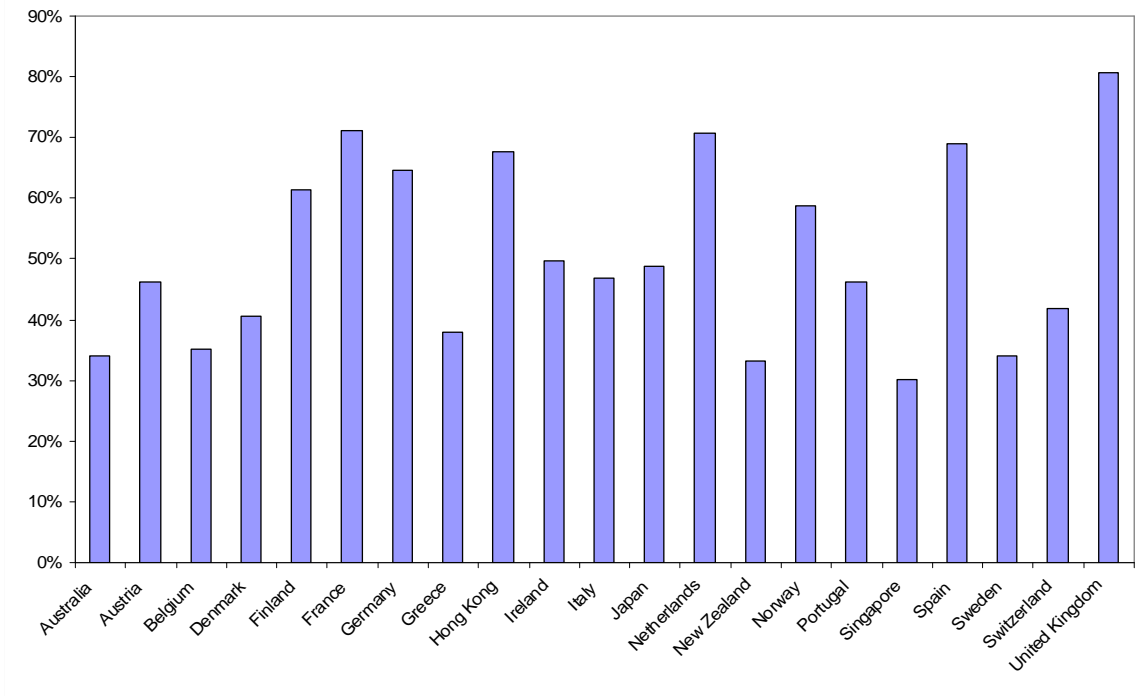


Exhibit 2
% Composition of ADRs (vs. Non-ADRs)
by Sector Buckets in EAFE

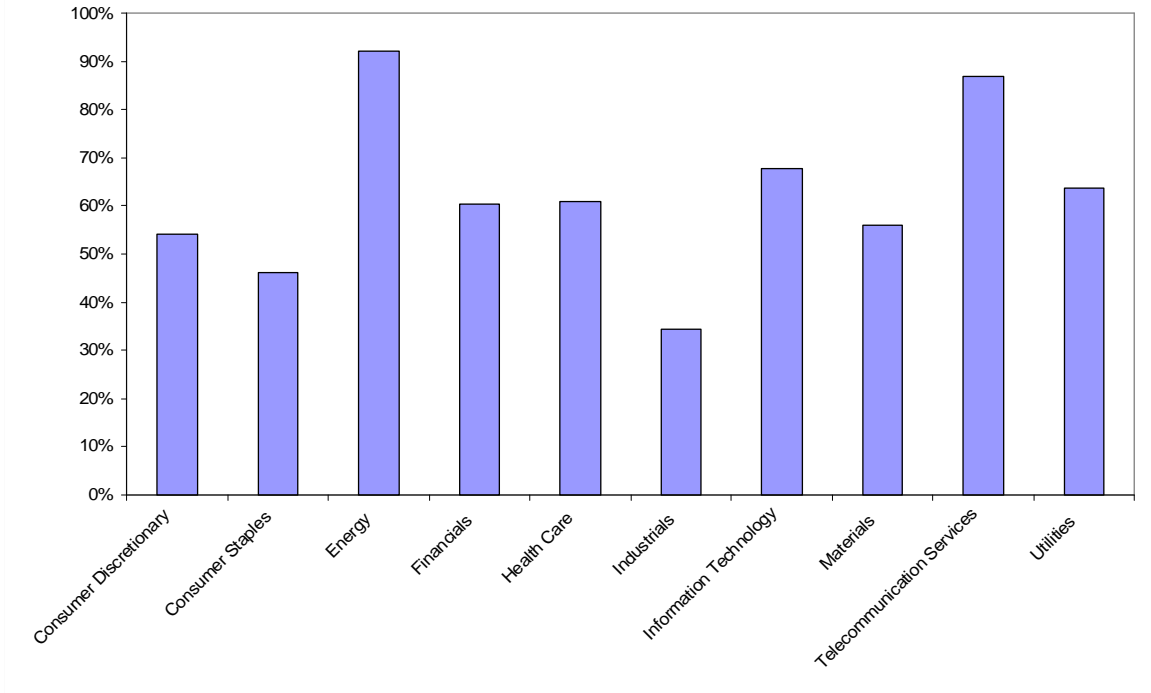


Exhibit 3
% Composition of ADRs (vs. Non-ADRs)
by Size Buckets in EAFE
(\$-Billions of Market Cap)

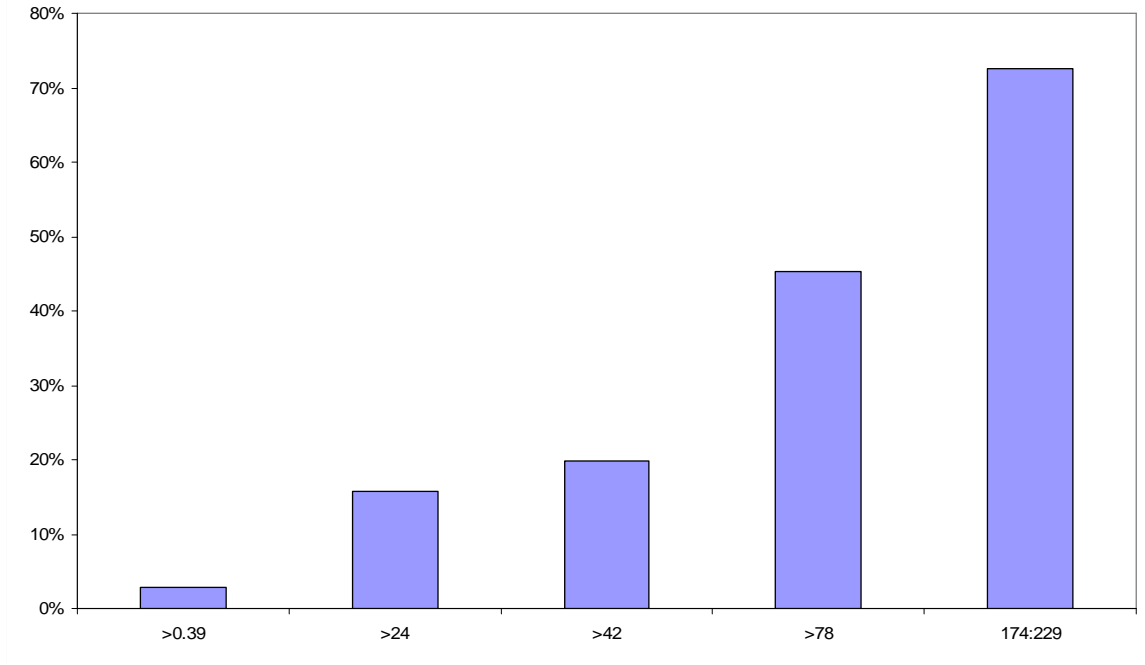


Exhibit 4
% Composition of ADRs (vs. Non-ADRs)
by Beta Buckets in EAFE

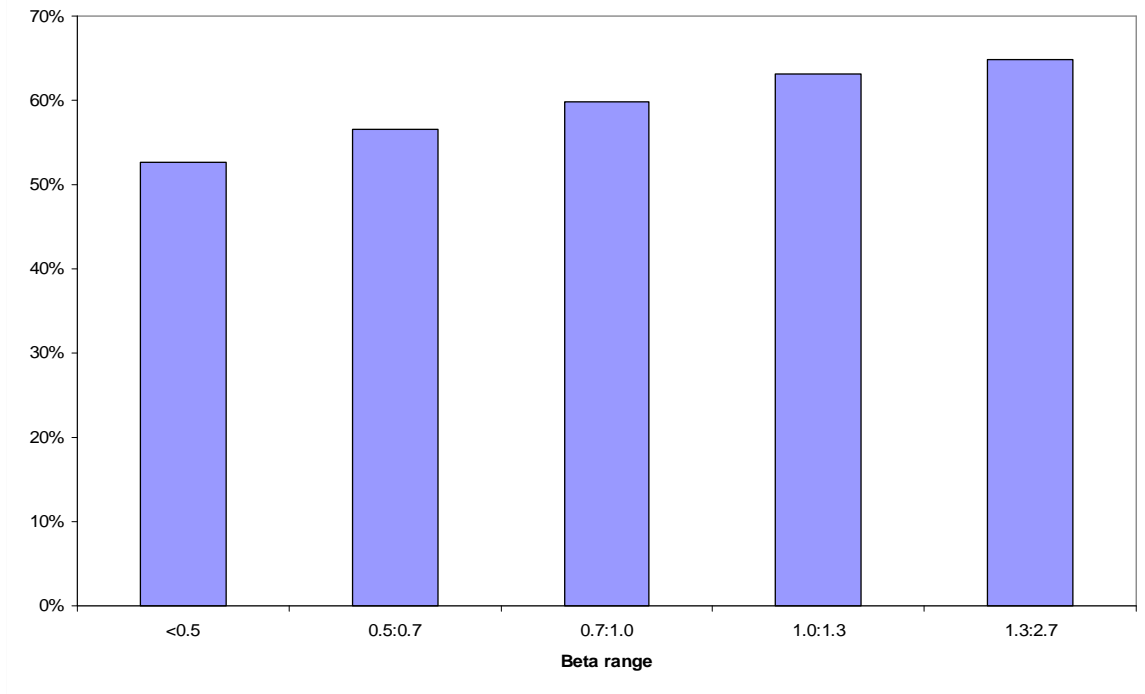


Exhibit 5
% Composition of ADRs (vs. Non-ADRs)
by Price-to-Book Buckets in EAFE

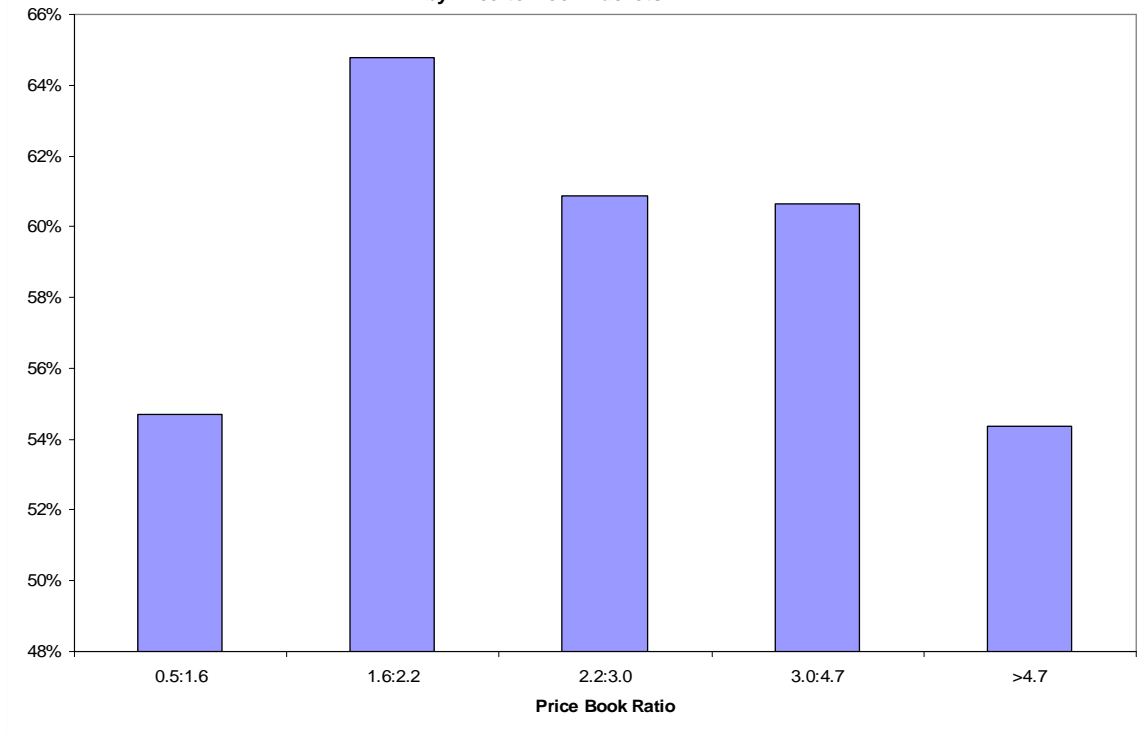


Exhibit 6
%Composition of ADRs (vs. Non-ADRs)
by Dividend Yield Buckets in EAFE

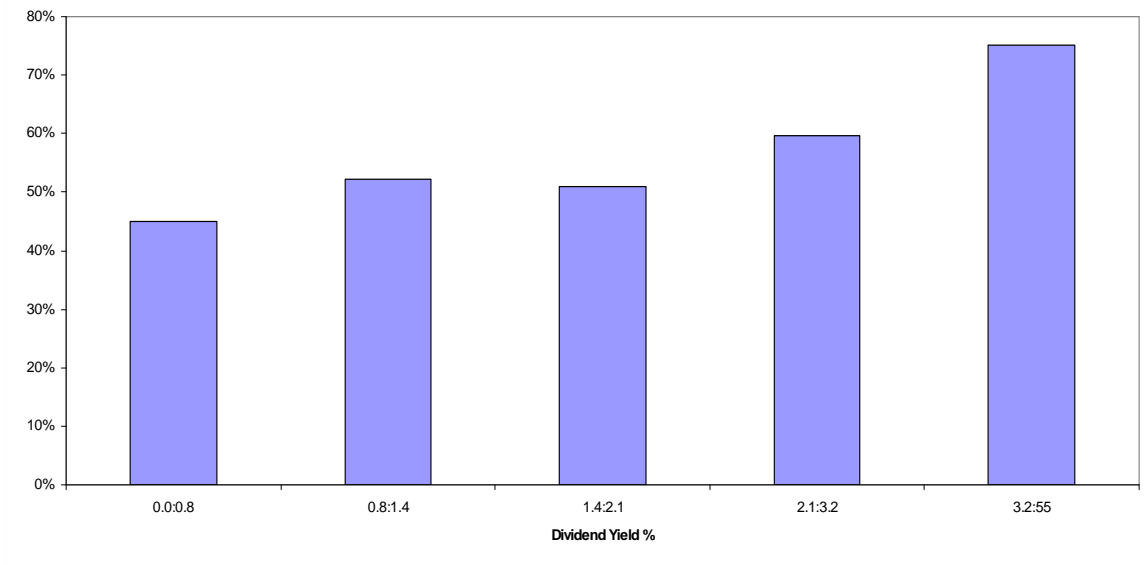


Exhibit 7
Performance of ADRs versus Broader Indexes
January 1998 to June 2007

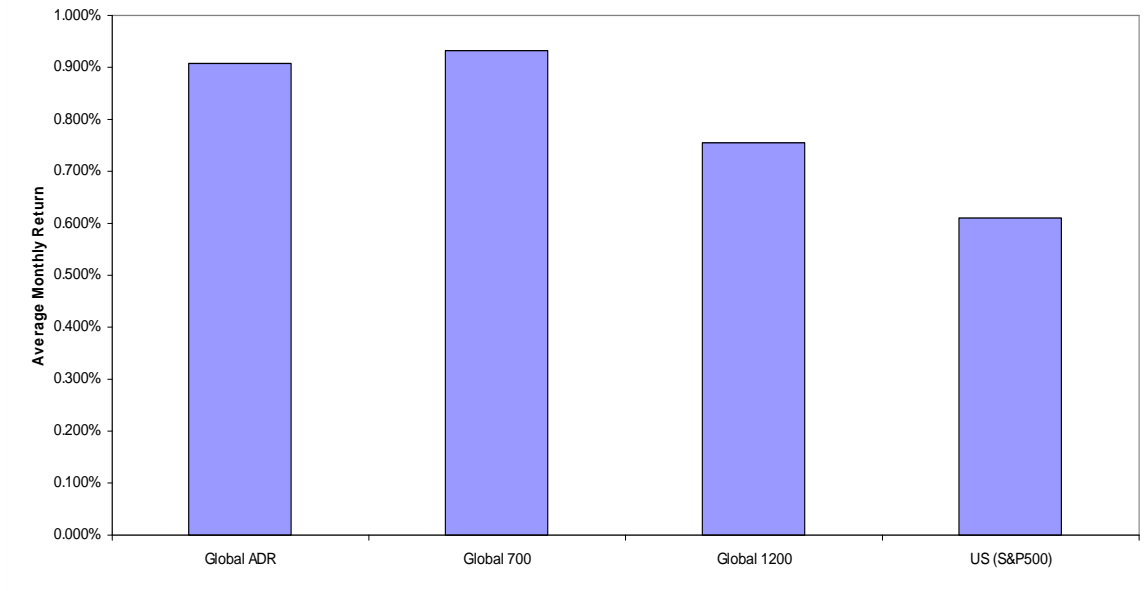


Exhibit 8
Coefficient of Variation: ADRs versus Diversified Indexes
January 1998 to June 2007

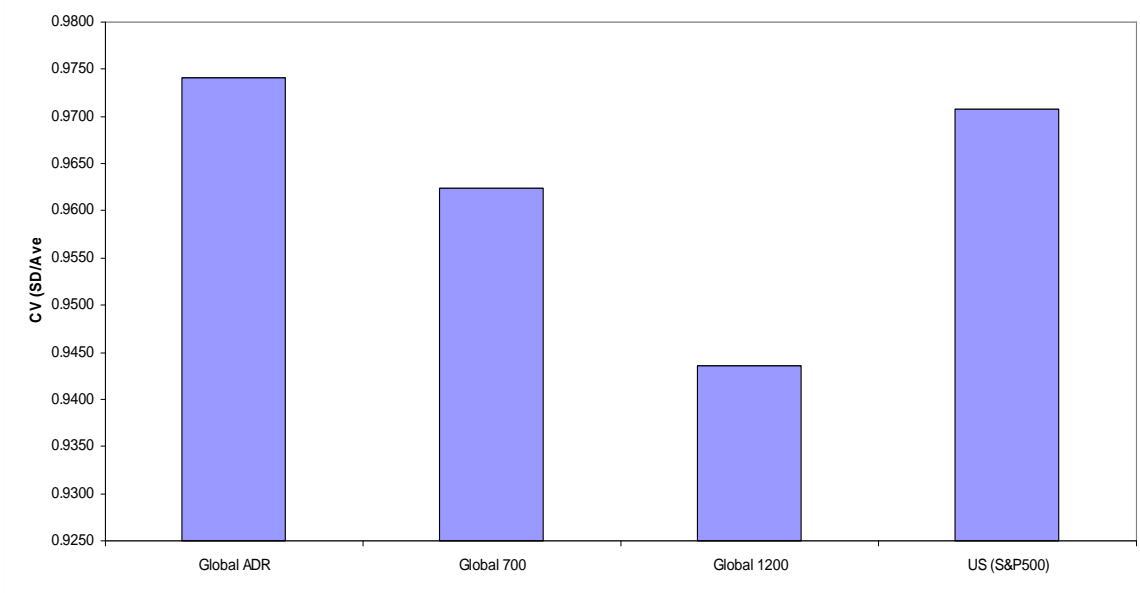
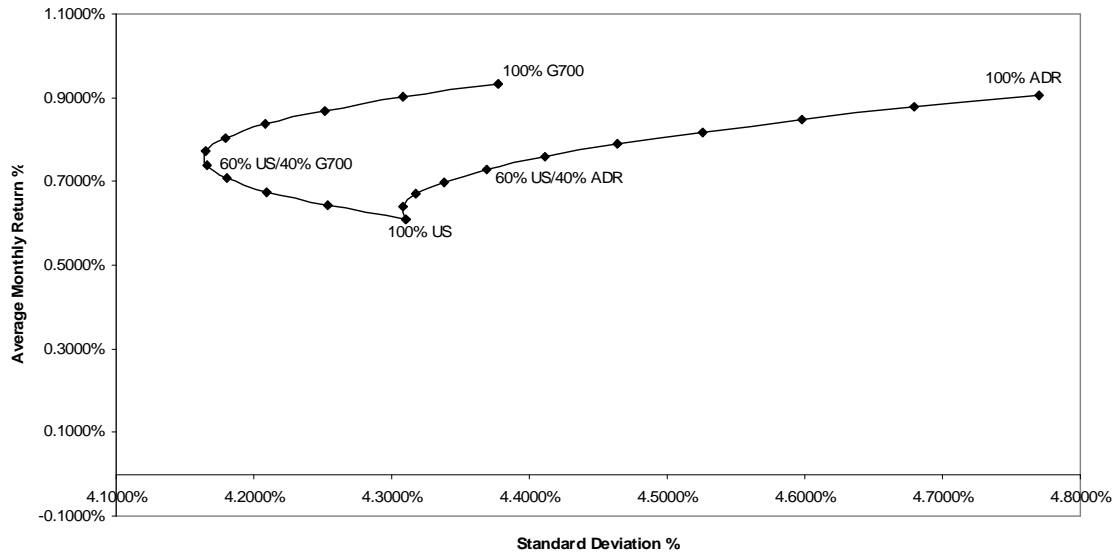


Exhibit 9
Efficient Frontier Analysis:
US & Global 700 vs. US & ADR
January 1998 to June 2007



¹ ADRs are listed on the NYSE, ASE and NASDAQ.

² An ADR can be unsponsored; a US bank buys shares of a foreign corporation, does not register them with the SEC and deposits them at a custodian bank. However, such ADRs are increasingly uncommon and cannot be listed on the major American stock exchanges since they do not comply with the listing requirements. In addition, there are Rule 144A Depositary Receipts, which are special ADRs that can only be sold to Qualified Institutional Buyers as a private placement.

³ On November 15, 2007, the U.S. Securities and Exchange Commission announced new rules for the listing of foreign stocks on U.S. exchanges. As such, foreign companies that prepare their financial statements according to International Financial Reporting Standards (IFRS) as accepted by the International Accounting Standards Board (IASB) *no* longer have to prepare or reconcile their financial statements to U.S. GAAP.

⁴ In our displays (exhibits) of ADR characteristics, the percentage of ADRs and non-ADRs in EAFE add to “100” by factor *buckets*. For example, in Exhibit 1, ADRs on United Kingdom stocks make up 81% percent of U.K. stocks covered in the EAFE index. We also refer to this factor-bucket-based percentage as the ADR-to-non-ADR ratio.