Performance Evaluation of Continental and East European ADRs

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ABSTRACT

American Depositary Receipts (ADRs) are the vehicle of choice for many US investors who wish to purchase overseas stocks. The nature and performance of these ADRs, therefore, is a matter of considerable interest to investors, corporate financial managers, and international bankers. This study bridges the gap between academic and practitioner literature on the nature and performance of Continental and East European ADRs. Using rigorous statistical measures grounded in modern portfolio theory, this study reports the risk-adjusted performance of these ADRs with a view to providing valuable input to global investors who are contemplating investments in Continental and East European corporations.

Keywords: ADRs, portfolio choice, investment decisions, emerging markets

INTRODUCTION

Global investors can access international stocks via structured products such as open-end or closed-end mutual funds or by purchase of stocks or Global Depositary Receipts (GDRs) based on stocks. In the United States, GDRs are known as American Depositary Receipts (ADRs). As of January 2009, there were 2034 ADRs listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), the NASDAQ system, and on private trading networks.

An ADR is created when a depositary bank purchases shares in a foreign corporation, holds the shares in trust and issues receipts based on this holding. The receipts are then listed on the US stock market and can be bought and sold by US investors. ADRs offer investors the convenience of trading in a familiar stock market. It may be noted that ADRs also enable foreign firms to raise funds in the US capital market without having to meet the stringent listing requirements of U.S. stock exchanges. This study examines the nature and performance of ADRs based on shares of Continental and East European companies.

When an ADR is issued at the request of the underlying firm, the issue is said to be "sponsored." A sponsored ADR is often referred to as an "American Depositary Share (ADS)." A sponsored ADR can only be issued by one depositary bank. At present, only sponsored ADRs are permitted to list on the NYSE and the AMEX. If an ADR is issued at the request of investors, the issue is said to be "unsponsored." These ADRs may be issued by more than one depositary bank, and can only trade in the OTC market.

The first part of this study examines the nature of ADRs from Continental and East Europe. The features examined in the study are the sponsorship status of the ADR, the industrial origin, depositary bank, and the market on which the ADR is listed. The second part of the study examines the performance of these ADRs using the internationally recognized Morgan Stanley Capital International Europe Australia and Far East (MSCI EAFE) Index and Standard and Poors 500 Index as two alternative market benchmarks.

The rest of this paper is structured as follows. The next section contains a review of literature on ADRs and presents the main findings of studies in the area of modern portfolio theory. The third section is an examination of the nature of ADRs. The fourth section is an evaluation of the performance of these ADRs on a risk-adjusted basis. The last section concludes the paper.

LITERATURE REVIEW

Treynor (1965), Sharpe (1966), and Jensen (1968) pioneered the evaluation of the performance of investment portfolios. They developed statistical techniques that are the most commonly used portfolio performance measures even today. Treynor (1965) suggested a way of evaluating the performance of a portfolio by adjusting the mean excess return for the degree of market risk and thus calculating the performance of the portfolio. Sharpe (1966) computed mean excess return and adjusted for the degree of total risk involved in the portfolio. Jensen (1968) devised a method of determining whether the deviation of portfolio returns from market returns was statistically significant, and, therefore, determining whether the excess return could be attributed to superior management, or purely to chance. The techniques used in these three pioneering studies

were further refined by Kon and Jen (1979), Henrikkson and Merton (1981), and Chang and Lewellen (1984).

Later on, Modigliani and Modigliani (1997) did some pioneering work in the area of financial reward and risk. They proposed a new risk-adjusted performance measure (hereafter referred to as, M Squared), which is intuitively quite appealing to investors. The idea that underlies their methodology is to adjust the returns of a portfolio to the level of risk in an unmanaged stock market index and then measure the returns on the risk-matched portfolio. This technique has two distinct advantages over earlier methods. First, it reports the risk-adjusted portfolio performance as a percentage, which is easily understood by a lay investor. Second, the technique permits investors to determine the degree of leverage that is needed to attain the highest return possible for a given level of risk. On the one hand, aggressive investors can use this information to raise their expected returns by levering their portfolio (borrowing money and investing in the right ADR). On the other hand, risk-averse investors can use this information to reduce their expected risk by unlevering their portfolio (selling off part of their holding in an ADR and investing the proceeds in a risk-free asset, such as a Treasury bill).

Separately, academicians and practitioners in finance have shown an interest in downside risk measures for evaluating portfolio performance. They argue that the risk that the investors really care about is the one that pertains to losing money or earning a return that is less than a minimum acceptable return. The positive deviations from this minimum acceptable return are not relevant for an investor who wants to measure risk-adjusted performance. Some researchers have come up with downside risk measures that take into account only negative deviations from the minimum acceptable return. These measures become more significant when one recognizes the skewness in financial data as a challenge to mean-variance efficiency. The most widely cited performance measure that adjusts for downside risk is the Sortino Ratio (Sortino and Price, 1994). In this paper, we use a modified Sortino Ratio that was introduced by Pedersen and Satchell (2002), who show that this ratio has a sound theoretical foundation.

Academics have studied the benefits of global diversification of investment portfolios extensively. Officer and Hoffmeister (1987) show that portfolio risk can be reduced significantly by including ADRs in a portfolio of purely domestic (U.S.) securities. Aggarwal, Dahiya, and Klapper (2005) analyze the investment allocation decision of mutual fund managers to invest in emerging market firms that are listed in their domestic markets and have issued ADRs in the U.S. as well. They find that ADRs are the preferred mode of holdings if the local market of the issuer has weak investor protection, low liquidity and high transaction costs, and if the firm is small and has limited analyst following. The motivation for cross-listing shares on foreign exchanges has also been widely researched (Saudagaran, 1988).

The relation between the price of ADRs and the underlying shares has also been studied thoroughly (Alexander, Eun, and Janakiramanan, 1987; Alexander, Eun, and Janakiramanan, 1988). Jayaraman, Shastri, and Tandon (1993) study the impact of international cross-listings using ADRs. Because ADRs can be exchanged for the underlying shares, financial arbitrage usually ensures that the price of an ADR is within transactions costs of the price of the underlying share.

To the knowledge of the authors, this is the first study of the nature and performance of ADRs on Continental and East European firms, particularly, their sponsorship status, industrial classification, names of banks that are active in this business, and exchanges on which these ADRs are listed. This is also the first rigorous study of the returns that

have accrued to these ADRs, from the point of view of U.S. based investors. The results of this study should be of interest to investors and mutual fund managers who are looking for opportunities to diversify their international portfolios, to managers of European firms who are contemplating sponsoring the issue of these securities in U.S. markets, and to the managers of banks, which provide international financial services.

NATURE OF CONTINENTAL AND EAST EUROPEAN ADRs

As of January 2009, there are 487 ADR issues on Continental European (Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland) firms and 89 ADR issues on East European (Czech Republic, Hungary, Kazakhstan, Poland, Russia, Ukraine) firms. Of the Continental European ADRs, 201 are sponsored whereas 286 are unsponsored. All East European ADRs are sponsored. Regarding the financial institutions that have issued Continental European ADRs, the Bank of New York Mellon accounts for 372 of these issues, followed by Citibank with 92 issues, Deutsche Bank with 81 issues, J.P. Morgan Chase with 67 issues, and Mellon Investor Services with one issue. It may be noted that these figures add up to more than the 487 Continental ADRs because unsponsored ADRs may be issued by more than one financial institution. Regarding East European ADRs, 64 were issued by the Bank of New York Mellon, 13 by J.P. Morgan Chase, and 12 by Deutsche Bank. Regarding the exchanges on which Continental European ADRs are listed, 55 are listed on the NYSE, 19 are listed on NASDAQ, three are listed on Portal, 401 are listed on OTC (other than NASDAQ), and the other nine are listed on OTCQX. Six ADRs from East Europe are listed on the NYSE, 61 are listed on OTC, and 22 are listed on Portal.

With respect to industrial classification, 33 of the Continental European ADRs are in the banking industry; 27 in pharmaceuticals and biotechnology; 23 in industrial engineering; 21 each in construction and materials and financial services; 19 in media; 18 each in fixed line telecommunications and industrial transportation; 16 each in software and computer services, support services, and technical hardware and equipment; 15 each in electronics and electric equipment and oil and gas producers; 14 each in chemicals and personal goods, 13 in automobiles and parts, 12 each in gas, water, and multiutility, general industrials, nonlife insurance, and travel and leisure; 11 each in food producers, general retailers, health care equipment and services, and oil equipment, services, and distribution; 10 in industrial metals and mining; nine in forestry and paper; eight in electricity; seven each in aerospace and defense, alternative energy, household goods and home construction, leisure goods, and life insurance; six each in beverages, food and drug retailers, and real estate investment and services; five each in equity investment instruments, mining, and mobile telecommunications; and one in tobacco.

Regarding industrial classification, 33 of the East European ADRs are in the electricity industry; 12 in fixed line telecommunications; 10 in oil and gas producers; seven in industrial metals and mining, four in chemicals, three each in general retailers, industrial transportation, and mobile telecommunications; two each in automobiles and parts, banks, and food producers; and one each in aerospace and defense, alternative energy, construction and materials, electronics and electric equipment, industrial

engineering, media, mining, and personal goods. All data are obtained from the website of the Bank of New York Mellon.

PERFORMANCE

A. Data and Methodology

Monthly return data for the three-year period January 2005 - December 2007 are obtained from CRSP. CRSP has full return data for six East European ADRs and 62 Continental European ADRs. Therefore, the final sample for the performance analysis consists of 68 ADRs. The return on U.S. 4-week Treasury Bills is used as the proxy for the risk-free rate. The MSCI EAFE Index and the S&P 500 Index are utilized as market benchmarks.

Monthly returns are averaged over the three-year period to obtain the *Mean return*. Risk-free rate of return is subtracted from the mean return to compute the *Mean excess return*. *Mean excess return* of each ADR is divided by its standard deviation to compute the *Sharpe measure*:

$$Si = \frac{Ri - Rf}{\sigma i}$$

where R_i = mean return on ADR i,
R_f = mean risk-free rate of return,
σ_i= standard deviation of returns for ADR i.

Mean excess return of each ADR is divided by its beta to obtain the *Treynor measure*:

$$Ti = \frac{Ri - Rf}{\beta_i}$$

where β_i is estimated from the market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

where R_{mt} = market return during period t,
e_{it} = error term.

Expected return of each ADR is subtracted from its actual *mean return* to compute *Jensen's Alpha*:

$$\alpha i = Ri - E[Ri]$$

where the expected return for each ADR is obtained using the Capital Asset Pricing Model:

$$E[Ri] = Rf + \beta i (Rm - Rf)$$

Jensen's Alphas are then tested for statistical significance.

Mean excess return for each ADR is divided by the *downside deviation* of that ADR's return from the risk-free rate of return to compute The *Sortino Ratio*:

$$SO_i = \frac{Ri - Rf}{DD_i}$$

where the *downside deviation* is estimated as follows:

$$\mathrm{DD}i = [\frac{1}{n-1} \sum_{j=1}^{n} (\max\{0, R_f - R_{ij}\})^2]^{1/2}$$

Sharpe measure is multiplied by the market standard deviation and then the risk-free rate added to calculate the *M Squared measure*:

$$M^2{}_i = \frac{Ri - Rf}{\sigma i} \sigma m + Rf$$

Benchmark standard deviation is divided by the ADR standard deviation to obtain the *Leverage Factor*:

$$L_i = \frac{\sigma m}{\sigma i}$$

Leverage Factor reports a comparison of the *total risk* in the ADR with the *total risk* in the market portfolio. For example, a *Leverage Factor* less than one implies that the risk of the ADR is greater than the risk of the market index, and that the investor should consider unlevering the ADR by selling off part of the holding in the ADR and investing the proceeds in a risk-free security, such as a Treasury bill. On the other hand, a *Leverage Factor* greater than one implies that the standard deviation of the ADR is less than the standard deviation of the market index, and that the investor should consider levering the ADR by borrowing money (if possible, at the risk-free rate of return) and investing in that particular ADR.

The significance of the *Leverage Factor* is that we use it to form a portfolio that has the same total risk (standard deviation) as the market portfolio using the ADR and the risk-free asset. By forming this portfolio, we limit our risk exposure to the market risk without sacrificing too much on the return. These *Leverage Factors* are used to compute the adjusted returns in Tables 5 and 6. First, the *Mean Monthly Adjusted Return* is computed using the *Leverage Factor*:

$$MAR_i = L_i R_i + (1 - L_i) R_f$$

Finally, *Mean Annual Adjusted Return* is calculated by compounding over 12 months:

$$AAR_i = (1 + MAR_i)^{12} - 1$$

B. Results

The 68 ADRs with full monthly return data are identified in Tables 1 and 2 along with their risk, return, and performance statistics. MSCI EAFE is the market benchmark in Table 1 and S&P 500 is the market benchmark in Table 2. Returns, of course, are

Table 1: 3-Year Performance on a Monthly Basis (2005-2007)
Using MSCI EAFE as Market Benchmark

	ADRs	Country	Avg (%)	Std (%)	Sharpe	Sortino	Beta	M Squared	Alpha	Alpha t-stat	Treynor
1	ABB	Switzerland	4.86	6.26	0.72	1.93	1.45	2.38	3.13	3.11*	3.13
2	Acergy	Norway	3.95	9.81	0.37	0.65	1.53	1.38	2.14	1.56	2.37
3	Aegon	Netherlands	1.15	5.29	0.15	0.23	1.11	0.77	-0.26	-0.15	0.73
4	Air France-KLM	France	2.07	7.70	0.23	0.39	1.36	0.97	0.43	0.57	1.28
5	Alcatel-Lucent	France	-1.64	8.60	-0.23	-0.28	1.75	-0.32	-3.65	-1.94	-1.13
6	Allianz	Germany	1.62	5.37	0.24	0.37	1.03	1.01	0.30	0.32	1.25
7	ArcelorMittal	Luxembourg	2.82	12.51	0.20	0.34	2.58	0.90	0.01	0.71	0.97
8	ASM International	Netherlands	1.43	8.48	0.13	0.19	1.43	0.70	-0.28	0.09	0.77
9	ASML	Netherlands	2.05	7.04	0.24	0.43	1.05	1.02	0.71	0.60	1.64
10	AXA	France	1.76	4.94	0.29	0.53	1.05	1.15	0.42	0.49	1.36
11	Banco Bilbao Vizcaya Argentaria	Spain	1.26	4.61	0.20	0.40	1.02	0.91	-0.05	-0.03	0.92
12	Banco Santander S.A	Spain	1.96	4.43	0.37	0.84	1.06	1.37	0.61	0.76	1.54
13	CGG Veritas	France	4.80	11.93	0.37	0.95	2.41	1.39	2.14	1.72	1.85
14	CNH Global	Netherlands	3.98	9.96	0.37	0.88	0.88	1.37	2.81	1.56	4.16
15	Coca-Cola HBC	Greece	3.07	5.85	0.47	1.17	1.15	1.66	1.63	1.64	2.38
16	Credit Suisse	Switzerland	1.38	5.70	0.18	0.32	1.51	0.85	-0.41	0.08	0.70
17	Crucell	Netherlands	0.99	10.41	0.06	0.12	0.75	0.51	-0.06	-0.17	0.88
18	Daimler	Germany	2.48	7.36	0.29	0.67	1.68	1.16	0.52	0.90	1.27
19	Dampskibsselskabet Torm	Denmark	2.56	7.33	0.30	0.56	0.90	1.19	1.36	0.96	2.49
20	Dassault Systemes	France	0.62	4.86	0.06	0.09	0.76	0.50	-0.45	-0.72	0.38
21	Delhaize	Belgium	0.72	5.78	0.07	0.09	1.02	0.52	-0.60	-0.54	0.38
22	Deutsche Bank	Germany	1.43	5.28	0.21	0.36	1.24	0.92	-0.09	0.14	0.89
23	Deutsche Telekom	Germany	0.42	5.36	0.02	0.03	0.47	0.38	-0.36	-0.86	0.19
24	Edap	France	2.84	24.24	0.10	0.25	1.88	0.63	0.70	0.38	1.34
25	Eni	Italy	1.57	4.53	0.27	0.50	1.05	1.10	0.22	0.30	1.17
26	Ericsson	Sweden	-0.38	7.74	-0.09	-0.11	1.28	0.07	-1.94	-1.22	-0.56
27	Flamel Technologies	France	-0.56	15.63	-0.06	-0.08	1.40	0.17	-2.24	-0.70	-0.64
28	France Telecom	France	0.75	5.86	0.07	0.12	0.59	0.53	-0.15	-0.50	0.71
29	Fresenius Medical Care	Germany	2.13	4.76	0.38	0.75	0.79	1.40	1.04	0.91	2.28
30	GPC Biotech	Germany	-1.72	18.07	-0.11	-0.13	1.72	0.01	-3.71	-0.99	-1.20
31	Head	Netherlands	0.68	8.17	0.04	0.07	1.29	0.45	-0.89	-0.43	0.27
32	Hellenic Telecom	Greece	2.30	5.72	0.34	0.66	0.88	1.31	1.12	0.95	2.23
33	ILOG	France	-0.12	8.40	-0.05	-0.07	1.31	0.18	-1.71	-0.96	-0.34
34	Infineon Technologies	Germany	0.51	8.17	0.02	0.03	1.68	0.39	-1.44	-0.54	0.11
35	ING Groep	Netherlands	1.20	5.32	0.16	0.27	1.22	0.79	-0.30	-0.10	0.71
36	Koninklijke KPN	Netherlands	2.35	5.19	0.39	0.82	0.91	1.43	1.14	1.07	2.22
37	Koninklijke Philips Electronics	Netherlands	1.64	5.35	0.24	0.43	1.10	1.02	0.24	0.34	1.19
38	Logitech International	Switzerland	2.80	8.34	0.30	0.68	1.08	1.17	1.42	1.02	2.28
39	Luxottica	Italy	1.45	4.91	0.23	0.39	0.84	0.98	0.31	0.16	1.34
40	National Bank of Greece	Greece	2.55	5.78	0.38	0.65	1.12	1.42	1.14	1.17	1.98
41	Natuzzi	Italy	-2.02	7.64	-0.31	-0.33	0.81	-0.54	-3.14	-2.44*	-2.89
42	Nokia	Finland	2.88	5.81	0.44	1.13	0.96	1.57	1.62	1.47	2.65
43	Novartis	Switzerland	0.42	3.64	0.02	0.03	0.43	0.40	-0.33	-1.14	0.20
44	Novo Nordisk	Denmark	2.69	4.95	0.48	1.12	0.61	1.68	1.77	1.47	3.87
45	Portugal Telecom	Portugal	1.10	4.57	0.17	0.33	0.56	0.81	0.23	-0.21	1.37
46	Randgold Resources	Jersey	3.92	11.42	0.31	0.71	2.45	1.22	1.23	1.34	1.47

47 Repsol YPF	Spain	1.24	5.70	0.16	0.29	1.02	0.78	-0.08	-0.05	0.89
48 Sanofi-Aventis	France	0.69	5.51	0.07	0.09	0.53	0.52	-0.15	-0.59	0.68
49 SAP	Germany	0.65	5.86	0.06	0.08	0.72	0.49	-0.37	-0.59	0.45
50 SCOR Holding	Switzerland	1.90	7.08	0.22	0.38	1.38	0.96	0.24	0.48	1.14
51 Siemens	Germany	2.08	6.25	0.28	0.51	0.99	1.12	0.79	0.68	1.76
52 StatoilHydro	Norway	2.61	8.87	0.26	0.51	2.03	1.06	0.32	0.85	1.12
53 STMicroelectronics	Italy	-0.54	6.56	-0.13	-0.16	1.36	-0.05	-2.18	-1.54	-0.64
54 Syngenta	Switzerland	2.74	5.33	0.45	1.22	0.84	1.62	1.61	1.44	2.88
55 Telecom Italia	Italy	-0.22	4.71	-0.12	-0.16	0.78	0.00	-1.31	-1.66	-0.71
56 Telefonica	Spain	2.06	4.87	0.35	0.88	0.68	1.34	1.07	0.81	2.55
57 Thomson	France	-1.31	7.56	-0.22	-0.27	1.53	-0.29	-3.12	-1.94	-1.07
58 TOTAL	France	1.56	4.71	0.26	0.44	1.02	1.07	0.25	0.29	1.21
59 UBS	Switzerland	0.63	5.39	0.06	0.09	1.40	0.49	-1.04	-0.65	0.22
60 Unilever	Netherlands	1.79	4.15	0.35	0.81	0.33	1.33	1.14	0.59	4.39
61 Veolia Environnement	France	2.92	5.32	0.49	1.04	1.07	1.71	1.55	1.62	2.41
62 Wavecom	France	3.44	14.32	0.22	0.38	0.83	0.95	2.31	0.88	3.74
63 Magyar Telekom	Hungary	1.16	7.31	0.11	0.19	1.31	0.65	-0.44	-0.11	0.63
64 Mechel Steel	Russia	5.43	14.82	0.34	0.82	1.76	1.31	3.41	1.64	2.90
65 Mobile TeleSystems	Russia	3.50	7.62	0.42	0.84	0.78	1.51	2.42	1.63	4.06
66 Rostelecom	Russia	5.91	10.91	0.51	1.77	0.32	1.78	5.26	2.45*	17.22
67 Vimpel Communications	Russia	5.43	9.22	0.55	1.21	1.22	1.90	3.92	2.57*	4.17
68 Wimm-Bill-Dann Foods	Russia	7.07	12.32	0.55	1.65	1.10	1.88	5.68	2.74*	6.14
MSCI EAFE		1.29	2.84	0.34	0.62	1.00	1.29	0.00	0.00	0.96
US 4-Week Treasury Bill		0.33	0.08	0.00	0.00	0.01	0.33	-0.01	-2.04*	0.00

* Significant at the 5% level.

reported in US dollars. The ADRs are ranked in alphabetical order for each region; Continental European ADRs are listed first, followed by East European ADRs. The ADR with the highest mean return is Wimm-Bill-Dann Foods of Russia with an average monthly return of 7.07 percent. In comparison, the monthly mean return of the benchmark MSCI EAFE Index is 1.29 percent and the monthly mean return of the benchmark S&P 500 Index is 0.72 percent. The ADR with the highest total risk (measured by the standard deviation of returns) is Edap of France with a monthly standard deviation of 24.24 percent. In comparison, the standard deviation of the benchmark MSCI EAFE Index is 2.84 percent and the standard deviation of the benchmark S&P 500 Index is 2.25 percent. Further, Tables 1 and 2 report the numerical values of the Sharpe and Sortino measures, which are used to rank the ADRs in Tables 3 and 4. The highest Sharpe and Sortino measures obtained (0.72 and 1.93) are by ABB of Switzerland. In comparison, the Sharpe measure and the Sortino measure of the benchmark MSCI EAFE Index is 0.34 and 0.62, respectively. On the other hand, the Sharpe measure and the Sortino measure of the benchmark S&P 500 Index is 0.17 and 0.25, respectively.

Table 1 also reports the values of ADR Betas, M Squared measures, Jensen's Alphas (and their t-statistics), and Treynor measures, all of which are computed using the benchmark MSCI EAFE Index. The ADR with the highest systematic risk (Beta=2.58) is ArcelorMittal of Luxembourg. In comparison, the Beta of the benchmark MSCI EAFE Index is, by definition, exactly 1.0. The ADR with the highest M Squared measure (2.38) is ABB of Switzerland. In comparison, the benchmark MSCI EAFE index has an M Squared measure of 1.29. The ADR with the highest Alpha measure is Wimm-Bill-Dann Foods of Russia with Alpha equal to 5.68, which is significant at the five percent level. Vimpel Communications of Russia, Rostelecom of Russia, and ABB of Switzerland also

have significantly positive Alphas. Note that a statistically significant alpha implies that it is improbable that the underlying returns arose solely from stock market conditions. The Alpha measure of the benchmark MSCI EAFE Index is, by definition, zero. Finally, the ADR with the highest Treynor measure (17.22) is Rostelecom of Russia, partly due to having the lowest Beta of 0.32. In comparison, the Treynor measure for the MSCI EAFE Index is 0.96.

Table 2 also reports the values of ADR Betas, M Squared measures, Jensen's Alphas (and their t-statistics), and Treynor measures, all of which are computed using the benchmark S&P 500 Index. The ADR with the highest systematic risk (Beta=3.52) is ArcelorMittal of Luxembourg. In comparison, the Beta of the benchmark S&P 500 Index is, by definition, exactly 1.0. The ADR with the highest M Squared measure (1.96) is ABB of Switzerland. In comparison, the benchmark S&P 500 index has an M Squared measure of 0.72. The ADR with the highest Alpha measure is Wimm-Bill-Dann Foods of Russia with Alpha equal to 6.56, which is significant at the five percent level. ABB of Switzerland, CGG Veritas of France, Coca Cola HBC of Greece, Nokia of Finland, Novo Nordisk of Denmark, Syngenta of Switzerland, Veolia Environnement of France, Mobile TeleSystems of Russia, Rostelecom of Russia, and Vimpel Communications of Russia also have significantly positive Alphas. The number of ADRs with significantly positive Alphas increases from four to 11 since it is more likely to outperform S&P 500, which has underperformed MSCI EAFE in the study period. The Alpha measure of the benchmark S&P 500 Index is, by definition, zero. Finally, the ADR with the highest Treynor measure (40.83) is Rostelecom of Russia, partly due to having the lowest Beta of 0.14. In comparison, the Treynor measure for the S&P 500 Index is 0.39.

Table 2: 3-Year Performance on a Monthly Basis (2005-2007) Using S&P 500 as Market Benchmark

	ADRs	Country	Avg (%)	Std (%)	Sharpe	Sortino	Beta	M Squared	Alpha	Alpha t-stat	Treynor
1	ABB	Switzerland	4.86	6.26	0.72	1.93	1.58	1.96	3.91	3.73*	2.86
2	Acergy	Norway	3.95	9.81	0.37	0.65	1.58	1.16	3.01	1.93	2.28
3	Aegon	Netherlands	1.15	5.29	0.15	0.23	1.60	0.68	0.20	0.45	0.51
4	Air France-KLM	France	2.07	7.70	0.23	0.39	1.91	0.84	1.00	1.01	0.91
5	Alcatel-Lucent	France	-1.64	8.60	-0.23	-0.28	2.37	-0.18	-2.88	-1.59	-0.83
6	Allianz	Germany	1.62	5.37	0.24	0.37	1.48	0.87	0.71	0.93	0.87
7	ArcelorMittal	Luxembourg	2.82	12.51	0.20	0.34	3.52	0.78	1.14	0.99	0.71
8	ASM International	Netherlands	1.43	8.48	0.13	0.19	2.07	0.62	0.30	0.49	0.53
9	ASML	Netherlands	2.05	7.04	0.24	0.43	1.60	0.88	1.10	1.08	1.07
10	AXA	France	1.76	4.94	0.29	0.53	1.40	0.98	0.89	1.15	1.02
11	Banco Bilbao Vizcaya Argentaria	Spain	1.26	4.61	0.20	0.40	1.12	0.79	0.50	0.64	0.83
12	Banco Santander S.A	Spain	1.96	4.43	0.37	0.84	1.13	1.16	1.20	1.50	1.45
13	CGG Veritas	France	4.80	11.93	0.37	0.95	2.22	1.17	3.61	2.02*	2.01
14	CNH Global	Netherlands	3.98	9.96	0.37	0.88	1.39	1.16	3.12	1.92	2.64
15	Coca-Cola HBC	Greece	3.07	5.85	0.47	1.17	1.14	1.38	2.30	2.25	2.39
16	Credit Suisse	Switzerland	1.38	5.70	0.18	0.32	1.75	0.75	0.38	0.65	0.60
17	Crucell	Netherlands	0.99	10.41	0.06	0.12	0.71	0.47	0.39	0.16	0.94
18	Daimler	Germany	2.48	7.36	0.29	0.67	1.78	0.99	1.46	1.37	1.21
19	Dampskibsselskabet Torm	Denmark	2.56	7.33	0.30	0.56	0.89	1.01	1.88	1.44	2.51
20	Dassault Systemes	France	0.62	4.86	0.06	0.09	1.30	0.46	-0.21	-0.11	0.22
21	Delhaize	Belgium	0.72	5.78	0.07	0.09	1.28	0.48	-0.11	0.00	0.30

22 Deutsche Bank	Germany	1.43	5.28	0.21	0.36	1.61	0.80	0.48	0.75	0.68
23 Deutsche Telekom	Germany	0.42	5.36	0.02	0.03	0.90	0.37	-0.26	-0.30	0.10
24 Edap	France	2.84	24.24	0.10	0.25	0.94	0.56	2.15	0.52	2.68
25 Eni	Italy	1.57	4.53	0.27	0.50	1.09	0.94	0.81	1.01	1.13
26 Ericsson	Sweden	-0.38	7.74	-0.09	-0.11	1.82	0.12	-1.42	-0.82	-0.39
27 Flamel Technologies	France	-0.56	15.63	-0.06	-0.08	2.72	0.20	-1.94	-0.48	-0.33
28 France Telecom	France	0.75	5.86	0.07	0.12	1.03	0.49	0.02	0.03	0.41
29 Fresenius Medical Care	Germany	2.13	4.76	0.38	0.75	0.50	1.18	1.61	1.61	3.58
30 GPC Biotech	Germany	-1.72	18.07	-0.11	-0.13	2.64	0.08	-3.07	-0.80	-0.78
31 Head	Netherlands	0.68	8.17	0.04	0.07	0.17	0.43	0.28	-0.03	2.08
32 Hellenic Telecom	Greece	2.30	5.72	0.34	0.66	1.36	1.11	1.45	1.55	1.45
33 ILOG	France	-0.12	8.40	-0.05	-0.07	0.68	0.21	-0.71	-0.58	-0.66
34 Infineon Technologies	Germany	0.51	8.17	0.02	0.03	1.83	0.38	-0.52	-0.14	0.10
35 ING Groep	Netherlands	1.20	5.32	0.16	0.27	1.71	0.70	0.21	0.50	0.51
36 Koninklijke KPN	Netherlands	2.35	5.19	0.39	0.82	0.97	1.21	1.64	1.73	2.08
37 Koninklijke Philips Electronics	Netherlands	1.64	5.35	0.24	0.43	1.49	0.88	0.73	0.95	0.88
38 Logitech International	Switzerland	2.80	8.34	0.30	0.68	1.85	1.00	1.75	1.44	1.33
39 Luxottica	Italy	1.45	4.91	0.23	0.39	1.02	0.84	0.73	0.82	1.10
40 National Bank of Greece	Greece	2.55	5.78	0.38	0.65	1.33	1.20	1.71	1.78	1.67
41 Natuzzi	Italy	-2.02	7.64	-0.31	-0.33	0.95	-0.36	-2.72	-2.06*	-2.47
42 Nokia	Finland	2.88	5.81	0.44	1.13	1.08	1.32	2.13	2.08*	2.36
43 Novartis	Switzerland	0.42	3.64	0.02	0.03	0.43	0.38	-0.08	-0.42	0.20
44 Novo Nordisk	Denmark	2.69	4.95	0.48	1.12	1.03	1.40	1.96	2.18*	2.28
45 Portugal Telecom	Portugal	1.10	4.57	0.17	0.33	0.41	0.71	0.61	0.46	1.87
46 Randgold Resources	Jersey	3.92	11.42	0.31	0.71	2.17	1.04	2.75	1.65	1.65
47 Repsol YPF	Spain	1.24	5.70	0.16	0.29	1.10	0.69	0.48	0.51	0.82
48 Sanofi-Aventis	France	0.69	5.51	0.07	0.09	0.41	0.48	0.20	-0.03	0.86
49 SAP	Germany	0.65	5.86	0.06	0.08	0.98	0.45	-0.06	-0.06	0.33
50 SCOR Holding	Switzerland	1.90	7.08	0.22	0.38	1.10	0.83	1.15	0.96	1.43
51 Siemens	Germany	2.08	6.25	0.28	0.51	1.24	0.96	1.27	1.23	1.41
52 StatoilHydro	Norway	2.61	8.87	0.26	0.51	1.39	0.91	1.75	1.24	1.65
53 STMicroelectronics	Italy	-0.54	6.56	-0.13	-0.16	2.07	0.03	-1.67	-1.09	-0.42
54 Syngenta	Switzerland	2.74	5.33	0.45	1.22	0.74	1.35	2.13	2.10*	3.25
55 Telecom Italia	Italy	-0.22	4.71	-0.12	-0.16	0.85	0.07	-0.88	-1.08	-0.65
56 Telefonica	Spain	2.06	4.87	0.35	0.88	0.71	1.13	1.45	1.50	2.43
57 Thomson	France	-1.31	7.56	-0.22	-0.27	1.62	-0.16	-2.27	-1.55	-1.02
58 TOTAL	France	1.56	4.71	0.26	0.44	0.85	0.92	0.90	0.97	1.44
59 UBS	Switzerland	0.63	5.39	0.06	0.09	1.61	0.46	-0.32	-0.09	0.19
60 Unilever	Netherlands	1.79	4.15	0.35	0.81	0.27	1.12	1.35	1.36	5.31
61 Veolia Environnement	France	2.92	5.32	0.49	1.04	1.12	1.43	2.16	2.29*	2.31
62 Wavecom	France	3.44	14.32	0.22	0.38	1.92	0.82	2.37	1.13	1.62
63 Magyar Telekom	Hungary	1.16	7.31	0.11	0.19	1.21	0.58	0.36	0.35	0.68
64 Mechel Steel	Russia	5.43	14.82	0.34	0.82	1.04	1.10	4.70	1.89	4.92
65 Mobile TeleSystems	Russia	3.50	7.62	0.42	0.84	0.81	1.27	2.86	2.10*	3.91
66 Rostelecom	Russia	5.91	10.91	0.51	1.77	0.14	1.48	5.52	2.79*	40.83
67 Vimpel Communications	Russia	5.43	9.22	0.55	1.21	2.26	1.57	4.22	2.98*	2.25
68 Wimm-Bill-Dann Foods	Russia	7.07	12.32	0.55	1.65	0.47	1.56	6.56	3.05*	14.43
S&P 500		0.72	2.25	0.17	0.25	1.00	0.72	0.00	0.00	0.39
US 4-Week Treasury Bill		0.33	0.08	0.00	0.00	0.01	0.33	0.00	-1.03	0.00

* Significant at the 5% level.

Table 3: Three-Year Ranking (2005-2007)
Using MSCI EAFE as Market Benchmark

ADRs	Country	Sharpe Rank (M Squared	Sortino Rank	Treynor Rank	Alpha Rank
ABB	Switzerland	1	1	9	5
Vimpel Communications	Russia	2	5	4	3
Wimm-Bill-Dann Foods	Russia	3	3	2	1
Rostelecom	Russia	4	2	1	2
Veolia Environnement	France	5	9	15	15
Novo Nordisk	Denmark	6	8	7	11
Coca-Cola HBC	Greece	7	6	16	12
Syngenta	Switzerland	8	4	11	14
Nokia	Finland	9	7	12	13
Mobile TeleSystems	Russia	10	13	6	7
Koninklijke KPN	Netherlands	11	16	21	19
National Bank of Greece	Greece	12	24	22	20
Fresenius Medical Care	Germany	13	18	19	24
CGG Veritas	France	14	10	23	10
Acergy	Norway	15	23	17	9
Banco Santander S.A	Spain	16	14	26	28
CNH Global	Netherlands	17	12	5	6
Telefonica	Spain	18	11	13	23
Unilever	Netherlands	19	17	3	21
Hellenic Telecom	Greece	20	22	20	22
Mechel Steel	Russia	21	15	10	4
MSCI EAFE		22	25	41	41
Randgold Resources	Jersey	23	19	27	18
Dampskibsselskabet Torm	Denmark	24	26	14	17
Logitech International	Switzerland	25	20	18	16
Daimler	Germany	26	21	33	29
AXA	France	27	27	29	31
Siemens	Germany	28	29	24	25
Eni	Italy	29	30	37	39
TOTAL	France	30	31	35	35
StatoilHydro	Norway	31	28	39	32
ASML	Netherlands	32	33	25	26
Koninklijke Philips	Netherlands	33	32	36	36
Allianz	Germany	34	39	34	34
Luxottica	Italy	35	36	31	33
Air France-KLM	France	36	35	32	30
SCOR Holding	Switzerland	37	37	38	37
Wavecom	France	38	38	8	8
Deutsche Bank	Germany	39	40	43	45
Banco Bilbao Vizcaya	Spain	40	34	42	42
ArcelorMittal	Luxembourg	41	41	40	40
Credit Suisse	Switzerland	42	43	50	54
Portugal Telecom	Portugal	43	42	28	38
ING Groep	Netherlands	44	45	48	50
Repsol YPF	Spain	45	44	44	44
Aegon	Netherlands	46	47	47	48
ASM International	Netherlands	47	49	46	49
Magyar Telekom	Hungary	48	48	52	55
Edap	France	49	46	30	27
France Telecom	France	50	51	49	46
Delhaize	Belgium	51	52	54	57
Sanofi-Aventis	France	52	53	51	47
Crucell	Netherlands	53	50	45	43
Dassault Systemes	France	54	54	55	56
UBS	Switzerland	55	55	57	59
SAP	Germany	56	56	53	53
Head	Netherlands	57	57	56	58
Novartis	Switzerland	58	58	58	51
Infineon Technologies	Germany	59	59	60	61
Deutsche Telekom	Germany	60	60	59	52
ILOG	France	61	61	61	62
Flamel Technologies	France	62	62	63	65

Ericsson	Sweden	63	63	62	63
GPC Biotech	Germany	64	64	68	69
Telecom Italia	Italy	65	66	65	60
STMicroelectronics	Italy	66	65	64	64
Thomson	France	67	67	66	66
Alcatel-Lucent	France	68	68	67	68
Natuzzi	Italy	69	69	69	67

Table 3 reports the rankings of all ADRs and the MSCI EAFE Index. The Sharpe ranks indicate that 21 ADRs have returns (adjusted for total risk) that exceed the risk-adjusted returns of the MSCI EAFE Index. The Sortino ranks indicate that 24 ADRs have returns (adjusted for total risk) that exceed the risk-adjusted returns of the MSCI EAFE Index. The Treynor and Alpha ranks in Table 3 indicate that 40 ADRs have returns (adjusted for systematic risk) that exceed the risk-adjusted returns of the MSCI EAFE Index. The ranking based on the M Squared measure is identical to the ranking based on the Sharpe measure.

Table 4: Three-Year Ranking (2005-2007) Using S&P 500 as Market Benchmark

ADRs	Country	Sharpe Rank (M Squared Rank)	Sortino Rank	Treynor Rank	Alpha Rank
ABB	Switzerland	1	1	8	5
Vimpel Communications	Russia	2	5	18	4
Wimm-Bill-Dann Foods	Russia	3	3	2	1
Rostelecom	Russia	4	2	1	2
Veolia Environnement	France	5	9	15	13
Novo Nordisk	Denmark	6	8	16	17
Coca-Cola HBC	Greece	7	6	13	12
Syngenta	Switzerland	8	4	7	16
Nokia	Finland	9	7	14	15
Mobile TeleSystems	Russia	10	13	5	9
Koninklijke KPN	Netherlands	11	16	20	22
National Bank of Greece	Greece	12	24	23	21
Fresenius Medical Care	Germany	13	18	6	23
CGG Veritas	France	14	10	21	6
Acergy	Norway	15	23	17	8
Banco Santander S.A	Spain	16	14	28	29
CNH Global	Netherlands	17	12	10	7
Telefonica	Spain	18	11	12	25
Unilever	Netherlands	19	17	3	27
Hellenic Telecom	Greece	20	22	27	26
Mechel Steel	Russia	21	15	4	3
Randgold Resources	Jersey	22	19	24	10
Dampskibsselskabet Torm	Denmark	23	25	11	18
Logitech International	Switzerland	24	20	32	19
Daimler	Germany	25	21	33	24
AXA	France	26	26	37	35
Siemens	Germany	27	28	31	28
Eni	Italy	28	29	34	36
TOTAL	France	29	30	29	34
StatoilHydro	Norway	30	27	25	20
ASML	Netherlands	31	32	36	32
Koninklijke Philips Electronics	Netherlands	32	31	40	37
Allianz	Germany	33	38	41	39
Luxottica	Italy	34	35	35	38
Air France-KLM	France	35	34	39	33
SCOR Holding	Switzerland	36	36	30	30
Wavecom	France	37	37	26	11
Deutsche Bank	Germany	38	39	47	43
Banco Bilbao Vizcaya Argentaria	Spain	39	33	43	41
ArcelorMittal	Luxembourg	40	40	45	31
Credit Suisse	Switzerland	41	42	48	45
S&P 500		42	46	53	53

Portugal Telecom	Portugal	43	41	22	40
ING Groep	Netherlands	44	44	51	49
Repsol YPF	Spain	45	43	44	42
Aegon	Netherlands	46	47	50	51
ASM International	Netherlands	47	49	49	47
Magyar Telekom	Hungary	48	48	46	46
Edap	France	49	45	9	14
France Telecom	France	50	51	52	52
Delhaize	Belgium	51	52	55	56
Sanofi-Aventis	France	52	53	42	50
Crucell	Netherlands	53	50	38	44
Dassault Systemes	France	54	54	56	57
UBS	Switzerland	55	55	58	59
SAP	Germany	56	56	54	54
Head	Netherlands	57	57	19	48
Novartis	Switzerland	58	58	57	55
Infineon Technologies	Germany	59	59	60	60
Deutsche Telekom	Germany	60	60	59	58
ILOG	France	61	61	65	61
Flamel Technologies	France	62	62	61	65
Ericsson	Sweden	63	63	62	63
GPC Biotech	Germany	64	64	66	69
Telecom Italia	Italy	65	66	64	62
STMicroelectronics	Italy	66	65	63	64
Thomson	France	67	67	68	66
Alcatel-Lucent	France	68	68	67	68
Natuzzi	Italy	69	69	69	67

Table 4 also reports the rankings of all ADRs, but with the S&P 500 Index. The Sharpe ranks indicate that 41 ADRs have returns (adjusted for total risk) that exceed the risk-adjusted returns of the S&P 500 Index. The Sortino ranks indicate that 45 ADRs have returns (adjusted for total risk) that exceed the risk-adjusted returns of the S&P 500 Index. The Treynor and Alpha ranks in Table 3 indicate that 52 ADRs have returns (adjusted for systematic risk) that exceed the risk-adjusted returns of the S&P 500 Index. The ranking based on the M Squared measure is identical to the ranking based on the Sharpe measure. However, the M Squared measure enables us to draw some inferences, which cannot be drawn from the Sharpe measure (or, as a matter of fact, from any other measure), and these are detailed at the end of this section.

Table 5 reports the average returns that accrue to the whole sample of ADRs with and without risk-adjustment using the MSCI EAFE Index as the benchmark. The returns are annualized for the convenience of investors. This is done by compounding the monthly mean returns over twelve periods. In this table, Wimm-Bill-Dann Foods of Russia, which ranks first based on unadjusted returns, falls back to rank three on the basis of returns adjusted for risk. Mechel Steel of Russia, which ranks third based on unadjusted returns, falls back to rank 21 on the basis of returns adjusted for risk. On the other hand, MSCI EAFE, which ranks 43rd on an unadjusted basis, ranks 22nd when the returns are adjusted for risk. ABB of Switzerland ranks fifth on the basis of unadjusted

Table 5: Three-Year Annualized Performance: Unadjusted and Adjusted for Risk Using MSCI EAFE as Market Benchmark

ADRs	Country	Unadjusted Annualized Returns	Unadjusted Rank	Adjusted Annualized Returns (%)	Adjusted Rank	Leverage Factor
ABB	Switzerland	76.63	5	32.63	1	0.45
Vimpel Communications	Russia	88.55	4	25.33	2	0.31
Wimm-Bill-Dann Foods	Russia	127.09	1	25.10	3	0.23
Rostelecom	Russia	99.11	2	23.59	4	0.26

Veolia Environnement	France	41.25	13	22.61	5	0.53
Novo Nordisk	Denmark	37.51	19	22.18	6	0.57
Coca-Cola HBC	Greece	43.76	12	21.85	7	0.49
Syngenta	Switzerland	38.39	18	21.21	8	0.53
Nokia	Finland	40.51	14	20.59	9	0.49
Mobile TeleSystems	Russia	51.07	10	19.71	10	0.37
Koninklijke KPN	Netherlands	32.11	24	18.64	11	0.55
National Bank of Greece	Greece	35.34	22	18.48	12	0.49
Fresenius Medical Care	Germany	28.81	26	18.22	13	0.60
CGG Veritas	France	75.54	6	18.07	14	0.24
Acergy	Norway	59.13	8	17.83	15	0.29
Banco Santander S.A	Spain	26.23	31	17.79	16	0.64
CNH Global	Netherlands	59.82	7	17.77	17	0.29
Telefonica	Spain	27.67	29	17.26	18	0.58
Unilever	Netherlands	23.70	33	17.14	19	0.68
Hellenic Telecom	Greece	31.42	25	16.89	20	0.50
Mechel Steel	Russia	88.60	3	16.87	21	0.19
MSCI EAFE		16.69	43	16.69	22	1.00
Randgold Resources	Jersey	58.65	9	15.71	23	0.25
Dampskibsselskabet Torm	Denmark	35.40	21	15.29	24	0.39
Logitech International	Switzerland	39.21	17	14.97	25	0.34
Daimler	Germany	34.13	23	14.82	26	0.39
AXA	France	23.24	34	14.71	27	0.57
Siemens	Germany	27.99	27	14.35	28	0.45
Eni	Italy	20.49	37	14.09	29	0.63
TOTAL	France	20.46	38	13.67	30	0.60
StatoilHydro	Norway	36.25	20	13.50	31	0.32
ASML	Netherlands	27.57	30	13.01	32	0.40
Koninklijke Philips	Netherlands	21.49	35	12.99	33	0.53
Allianz	Germany	21.20	36	12.80	34	0.53
Luxottica	Italy	18.86	39	12.38	35	0.58
Air France-KLM	France	27.85	28	12.30	36	0.37
SCOR Holding	Switzerland	25.35	32	12.15	37	0.40
Wavecom	France	50.08	11	11.98	38	0.20
Deutsche Bank	Germany	18.59	41	11.65	39	0.54
Banco Bilbao Vizcaya	Spain	16.27	44	11.42	40	0.62
ArcelorMittal	Luxembourg	39.63	16	11.29	41	0.23
Credit Suisse	Switzerland	17.90	42	10.74	42	0.50
Portugal Telecom	Portugal	14.08	49	10.17	43	0.62
ING Groep	Netherlands	15.36	46	9.95	44	0.53
Repsol YPF	Spain	15.92	45	9.81	45	0.50
Aegon	Netherlands	14.66	48	9.61	46	0.54
ASM International	Netherlands	18.60	40	8.72	47	0.33
Magyar Telekom	Hungary	14.80	47	8.10	48	0.39
Edap	France	40.01	15	7.76	49	0.12
France Telecom	France	9.40	51	6.61	50	0.48
Delhaize	Belgium	8.93	52	6.42	51	0.49
Sanofi-Aventis	France	8.60	53	6.37	52	0.52
Crucell	Netherlands	12.61	50	6.32	53	0.27
Dassault Systemes	France	7.66	57	6.14	54	0.58
UBS	Switzerland	7.87	56	6.04	55	0.53
SAP	Germany	8.14	55	6.01	56	0.48
Head	Netherlands	8.44	54	5.55	57	0.35
Novartis	Switzerland	5.11	60	4.87	58	0.78
Infineon Technologies	Germany	6.35	58	4.84	59	0.35
Deutsche Telekom	Germany	5.18	59	4.64	60	0.53
ILOG	France	-1.40	61	2.17	61	0.34
Flamel Technologies	France	-6.52	65	2.05	62	0.18
Ericsson	Sweden	-4.49	63	0.84	63	0.37
GPC Biotech	Germany	-18.82	68	0.10	64	0.16
Telecom Italia	Italy	-2.64	62	-0.04	65	0.60
STMicroelectronics	Italy	-6.28	64	-0.54	66	0.43
Thomson	France	-14.68	66	-3.39	67	0.38
Alcatel-Lucent	France	-17.95	67	-3.75	68	0.33
Natuzzi	Italy	-21.75	69	-6.33	69	0.37

returns, but ranks first based on returns adjusted for risk. More strikingly, Novo Nordisk of Denmark, which ranks 19th on the basis of unadjusted returns, ranks sixth on the basis of returns adjusted for risk. The leverage factor for this ADR is 0.57, which implies that an investor, who is comfortable with bearing the same level of risk as in the benchmark MSCI EAFE index, could unlever the ADR (lend 43 percent of her down payment, if possible, at the risk-free rate of interest and invest the rest in the ADR) and thereby attain an annual return level of 22.18 percent.

Table 6 reports the average returns with and without risk-adjustment using the S&P 500 Index as the benchmark. In that table, Wimm-Bill-Dann Foods of Russia, which ranks first based on unadjusted returns, falls back to rank three again on the basis of returns adjusted for risk. Mechel Steel of Russia, which ranks third based on unadjusted returns, falls back to rank 21 again on the basis of returns adjusted for risk. On the other hand, S&P 500, which ranks 51st on an unadjusted basis, ranks 42nd when the returns are adjusted for risk. ABB of Switzerland ranks fifth on the basis of unadjusted returns, but ranks first again based on returns adjusted for risk. More strikingly, Syngenta of Switzerland, which ranks 18th on the basis of unadjusted returns, ranks eighth on the basis of returns adjusted for risk. The leverage factor for this ADR is 0.42, which implies that an investor, who is comfortable with bearing the same level of risk as in the benchmark S&P 500 index, could unlever the ADR (lend 58 percent of her down payment, if possible, at the risk-free rate of interest and invest the rest in the ADR) and thereby attain an annual return level of 17.45 percent. The example below details how this return can be obtained.

Consider an investor who would like to earn superior returns on an ADR and, at the same time, bear only an average level of risk. In this example, the average level of risk is measured by the standard deviation of the benchmark S&P 500 index, which is 2.25 percent on a monthly basis. Now consider the following investment strategy: Suppose that the investor has $1,000 to invest. The investor could lend $580 and invest $420 in Syngenta. The end of month return from the ADR portion of the portfolio will be $420 x 0.0274 = $11.51. Suppose that the loaned funds were given at the monthly risk-free rate of 0.33 percent. In that case, the loaned funds will bring $580 x 0.0033 = $1.91. The portfolio return is $11.51 + $1.91 = $13.42, which is a return of 1.34 percent on a monthly basis or 17.32 percent (slightly off the 17.45 percent in Table 6 due to rounding) on an annual basis. Note that the monthly risk of the portfolio is 0.42 x 5.33 = 2.24 percent (again slightly off the 2.25 percent in Table 1 due to rounding), which is the same as the monthly standard deviation of the benchmark S&P 500 Index. This investment strategy, therefore, enables the investor to earn superior returns for an average level of risk. It may be noted that the above example assumes that the returns on risk-free US treasury bills are not correlated with the returns on the ADR.

Table 6: Three-Year Annualized Performance:
Unadjusted and Adjusted for Risk Using S&P 500 as Market Benchmark

ADRs	Country	Unadjusted Annualized Returns (%)	Unadjusted Rank	Adjusted Annualized Returns (%)	Adjusted Rank	Leverage Factor
ABB	Switzerland	76.63	5	26.17	1	0.36
Vimpel Communications	Russia	88.55	4	20.61	2	0.24
Wimm-Bill-Dann Foods	Russia	127.09	1	20.44	3	0.18
Rostelecom	Russia	99.11	2	19.28	4	0.21
Veolia Environnement	France	41.25	13	18.53	5	0.42

Novo Nordisk	Denmark	37.51	19	18.20	6	0.45
Coca-Cola HBC	Greece	43.76	12	17.94	7	0.38
Syngenta	Switzerland	38.39	18	17.45	8	0.42
Nokia	Finland	40.51	14	16.97	9	0.39
Mobile TeleSystems	Russia	51.07	10	16.29	10	0.30
Koninklijke KPN	Netherlands	32.11	24	15.46	11	0.43
National Bank of Greece	Greece	35.34	22	15.34	12	0.39
Fresenius Medical Care	Germany	28.81	26	15.14	13	0.47
CGG Veritas	France	75.54	6	15.03	14	0.19
Acergy	Norway	59.13	8	14.84	15	0.23
Banco Santander S.A	Spain	26.23	31	14.81	16	0.51
CNH Global	Netherlands	59.82	7	14.79	17	0.23
Telefonica	Spain	27.67	29	14.40	18	0.46
Unilever	Netherlands	23.70	33	14.30	19	0.54
Hellenic Telecom	Greece	31.42	25	14.12	20	0.39
Mechel Steel	Russia	88.60	3	14.09	21	0.15
Randgold Resources	Jersey	58.65	9	13.19	22	0.20
Dampskibsselskabet Torm	Denmark	35.40	21	12.87	23	0.31
Logitech International	Switzerland	39.21	17	12.62	24	0.27
Daimler	Germany	34.13	23	12.50	25	0.31
AXA	France	23.24	34	12.42	26	0.46
Siemens	Germany	27.99	27	12.14	27	0.36
Eni	Italy	20.49	37	11.93	28	0.50
TOTAL	France	20.46	38	11.61	29	0.48
StatoilHydro	Norway	36.25	20	11.47	30	0.25
ASML	Netherlands	27.57	30	11.09	31	0.32
Koninklijke Philips	Netherlands	21.49	35	11.08	32	0.42
Allianz	Germany	21.20	36	10.93	33	0.42
Luxottica	Italy	18.86	39	10.60	34	0.46
Air France-KLM	France	27.85	28	10.54	35	0.29
SCOR Holding	Switzerland	25.35	32	10.42	36	0.32
Wavecom	France	50.08	11	10.29	37	0.16
Deutsche Bank	Germany	18.59	41	10.03	38	0.43
Banco Bilbao Vizcaya	Spain	16.27	43	9.85	39	0.49
ArcelorMittal	Luxembourg	39.63	16	9.75	40	0.18
Credit Suisse	Switzerland	17.90	42	9.32	41	0.39
S&P500		8.94	51	8.94	42	1.00
Portugal Telecom	Portugal	14.08	48	8.88	43	0.49
ING Groep	Netherlands	15.36	45	8.70	44	0.42
Repsol YPF	Spain	15.92	44	8.59	45	0.39
Aegon	Netherlands	14.66	47	8.44	46	0.42
ASM International	Netherlands	18.60	40	7.73	47	0.27
Magyar Telekom	Hungary	14.80	46	7.25	48	0.31
Edap	France	40.01	15	6.98	49	0.09
France Telecom	France	9.40	50	6.07	50	0.38
Delhaize	Belgium	8.93	52	5.92	51	0.39
Sanofi-Aventis	France	8.60	53	5.88	52	0.41
Crucell	Netherlands	12.61	49	5.84	53	0.22
Dassault Systemes	France	7.66	57	5.70	54	0.46
UBS	Switzerland	7.87	56	5.62	55	0.42
SAP	Germany	8.14	55	5.60	56	0.38
Head	Netherlands	8.44	54	5.24	57	0.28
Novartis	Switzerland	5.11	60	4.70	58	0.62
Infineon Technologies	Germany	6.35	58	4.67	59	0.28
Deutsche Telekom	Germany	5.18	59	4.52	60	0.42
ILOG	France	-1.40	61	2.56	61	0.27
Flamel Technologies	France	-6.52	65	2.46	62	0.14
Ericsson	Sweden	-4.49	63	1.49	63	0.29
GPC Biotech	Germany	-18.82	68	0.91	64	0.12
Telecom Italia	Italy	-2.64	62	0.80	65	0.48
STMicroelectronics	Italy	-6.28	64	0.39	66	0.34
Thomson	France	-14.68	66	-1.89	67	0.30
Alcatel-Lucent	France	-17.95	67	-2.18	68	0.26
Natuzzi	Italy	-21.75	69	-4.26	69	0.29

It should also be noted that the annualized performance of the ADRs are somewhat inflated as a result of the significant appreciation in Euro against the U.S. dollar during the period of study.

CONCLUSION

ADRs represent a convenient vehicle to access other markets such as Europe for international investors who are contemplating purchase of stocks listed in those markets. These securities are useful in two ways. First, they enable global investors to earn returns on European stocks without the dual inconvenience of having to deal with time difference between countries and currency conversion. Second, they allow firms incorporated in Europe to tap U.S. capital markets without having to meet the stringent listing requirements of U.S. stock exchanges. There are 576 ADRs from Continental and East Europe that are listed on U.S. markets, and hence the investors have a wide range of choice of companies across diverse industry groups. This study examines the nature of these ADRs with emphasis on identifying the depositary bank, sponsorship status, industry classification, and market listing. Bank of New York Mellon issued an overwhelming majority of the ADRs, which are divided equally as sponsored and unsponsored. Again, an overwhelming majority of ADRs are listed on the OTC with banking and electricity as the most frequent two industries.

Prior research has reported the performance of individual European stocks in local currencies. However, risk-adjusted returns reported in terms of U.S. dollars would be more useful to international investors for, both, security selection and portfolio construction. In addition, from these investors' points of view, the instrument of choice for accessing European stock markets is the ADR, not the underlying stock itself. Hence, there is need for rigorous evaluation of the performance of ADRs using measures based on modern portfolio theory. There is extensive documentation on the performance of U.S. based stocks, especially for the Standard and Poors 500 Index components. Consequently, this study serves as an important complement to the existing literature on the construction of global portfolios.

In order to facilitate comparison with international stock markets, this study uses the Morgan Stanley Capital International EAFE Index and Standard and Poors 500 Index to evaluate the risk-adjusted performance of European ADRs. The results are similar for both indices although the ADRs seem to outperform the S&P 500 Index more often. ABB of Switzerland has the highest Sharpe and Sortino ratios whereas the Russian ADRs seem to dominate the other measures of performance. Some of these ADRs have unadjusted returns which are high, but once risk is factored in, the adjusted returns do not appear to be very attractive. On the other hand, some ADRs with modest returns may be rather striking to international investors, when their returns are adjusted for risk. Global investors may want to examine each of these securities in detail, in order to evaluate them further for possible inclusion in an investment portfolio. Of course, the contribution of a security to their portfolio return and their portfolio risk matters more to the global portfolio investors than the return and risk of the individual security.

This study provides initial evidence on the risk and return characteristics of ADRs from Europe. It would be beneficial to update this information on a continuing basis, in order to provide documentation to international investors with a desire to diversify into this market, but are not sure of which ADRs they would like to choose. Future research

may focus on decomposing the return to these ADRs into its two components: the financial performance of the underlying firm and the fluctuations in the exchange rate.

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