Cross-border Investments, Currency Risks and Portfolio Returns: The Case of Epack - Ghana

Vera Ogeh Fiador[1] & Felicia Joan Asare[2]

[1] Department of Finance, University of Ghana Business School, Legon, Ghana

[2] Databank Financial Services Limited, Asset Management Unit, Accra, Ghana

Correspondence: Vera Ogeh Fiador, Department of Finance, University of Ghana Business School, P. O. Box LG78, Legon, Ghana. Tel: 233-244-766-174. E-mail: vsoli@ug.edu.gh

Abstract

The study sought to examine the impact of currency risks on the performance of cross-border collective investment schemes. Using data monthly from Ghana and selected African countries over the period 2005 to 2010 and employing a Hendry type error correction model, the results of the study seem to indicate that ccurrency risks are important in explaining the returns on cross-border investments albeit with a lag and upon aggregation. The findings also indicate significant effects flowing from macroeconomic variables such as interest rates. These findings indicate a need to consider currency risks and domestic interest rates when compiling investment portfolios. The findings have significant policy implications as regards international or cross-border investments.

Keywords: currency risk, collective investment schemes, international diversification

1. Introduction

Over the past decade, the Ghanaian financial landscape has witnessed the emergence of various collective investment schemes (CIS), which have come to play a significant role in the mobilization of savings. As at the end of 2010, twenty-four (24) CIS had been licensed by the Securities and Exchange Commission (SEC, 2011), with Databank Epack Investment Fund Ltd (Epack), the first licensed equity mutual fund since 2002, dominating the mutual fund industry with respect to market share and assets under management. Epack, an open-ended mutual fund, operates in Ghana with some overseas stocks in its portfolio, mainly as a consequence of the illiquidity on the Ghanaian stock market coupled with limited listed stocks, among other factors.

According to Chen and Ang (2001), and in consonance with several others, international diversification, while giving investors exposure to stock and bond markets outside their country of origin and providing asset diversification and the possibility for yield or gains significantly greater than that in the domestic market, the conversion of stock and bond prices from the currency of 'investment country' to the domestic currency can also have negative implications for the return earned by local investors. As put succinctly by Addae-Dapaah and Tan Yon Hwee (2008), cross border activity means that investors must not only focus on the cashflow patterns but also on the impact of currency movements.

It is not farfetched therefore to hypothesize that the returns of Epack will be susceptible to a number of factors such as inflation, interest rate shocks and currency appreciation or depreciation among other macroeconomic fundamentals of the country where the investments are undertaken as well as on its homefront. The interplay of these factors can either enhance or reduce the net returns accrued to shareholders thereby introducing risk. Managing risks, in view of a given return, first involves the identification and measurement of the impact of the risk before appropiriate steps can be taken. The interest of this study is therefore to unravel how one such risk, the currency risk, influences the returns that that accrue to cross-border investments such as Epack.

2. The Literature

This section reviews relevant issues on international investing, currency risk and investment returns as well some emperical evidence.

2.1 Cross-Border Investments and Related Issues

The dynamics of cross-border investments have received some significant research attention in recent years. This

due to the fact that globalization has blurred the lines between countries, causing investors to easily cross borders in search of high return investments (Agenor, 2003). The general consensus, as regards, cross-border investments, is that investors can potentially improve risk-adjusted performance of their portfolios just by investing internationally (Schmittmann, 2010). This notion, supported by Sharpe-Lintner's CAPM and multi-factor models which suggests that investor go global, is also empirically documented by studies such as Levy and Sarnat (1970), Barry and Lockwood (1995), Ang and Bekaert (2002) and Solnik and McLeavey (2003) to mention a few.

The blurring of borderlines, as a result of globalization has, however, not evolved to cover the differencies betwwen countries' macroeconomic fundamentals and their potential effects on foreign investments, giving rise to a new school of thought that posits that the idea of above-average returns on a combined portfolio of domestic and international investments compared to purely a domestic one is unduly overstretched (Goetzmann & Ibbotson, 2005). According to this divide, the apparent benefits of investing internationally is tempered significantly by the presence of currency risk, which ultimately alters the risk-return profile of international investments.

Currency risk, also referred to exchange rate risk, represents the degree or potential to which an investment is likely to be affected by exchange rate movements. It can also be referred as the "the sensitivity of a firm's economic value, or stock price, to exchange rate changes" (Heckman, 1983) or its "economic exposure to exchange rate risk" (Adler & Dumas, 1984). Prior studies in the empirical literature have primarily focused on the measurement and impact of currency risk through the use of regressions and provided mixed results. However, after Adler and Dumus (1984), most studies on currency risk exposure have focused on measuring the exposure or currency risk as an elasticity between the change in firm value and exchange rate. Adler and Dumas (1984) regressed the return of an asset on an exchange rate change and reported different signs for different exchcnage rates. Bodnar and Wong (2000), regressed the stock returns on the change in exchange rate to obtain the currency risk elasticity.

Others researchers introduced additional exogenous variables to the model to ascertain whether the results will be the same. Jorion (1990) found evidence of significant exchange rate exposure by incorporating the market return as a control variable to determine the impact on the return on assets. He showed that the level of foreign sales is the main determinant of exchange rate exposure for large U.S. multinational firms.

However, Amihud (1994) and Bartov and Bodnar (1994) found no evidence of contemporaneous currency exposure for U.S. multinationals, although Bartov and Bodnar do find that U.S. firms respond to past quarterly exchange rate movements. Simalarly, by employing multivariate modelling approach, Miller and Reuner (2000) estimated economic exposure using a three-currency model, which included variables such as overall stock market return and interest rates. Flanney and James (1984) and Sweeney and Warga (1986) also used interest rates in their models when estimating the currency exposure of firms. In fact, Khoo (1994) added oil prices to interest rate in his estimation of foreign exchange of mining companies in Australia while Benson and Faff (2002), developed an accumulation index incorporating dividends to represent the domestic market return, the Australian Government 13-week Treasury notes to represent the risk free interest rate and the Morgan Stanley Capital International World Index (MSCI) to represent the international market return. They reviewed the possibility of using the weights of invested stock to determine the true impact of currency risk on excess fund returns in Australia. They found that the composite market return index is predictive with regards to portfolio returns. Most of such empiricals also control for the following in the regressions: interest rates, domestic and international indices.

It is obvious from the foregoing that the issue of currency risk cannot be taken lightly, as there is evidence even for domestic stock markets that currency risk exposure is valuable in explaining stock performance (Zubeiru et al., 2007; Adler & Dumas, 1984). Webb (1996) cautions, however, that though the issue of currency risk is evidently important, the impact holds more for international diversification in bonds and real estate than for stocks while Jorion (1990), indicates that its relevance only becomes apparent when it constitutes a significant portion of the assets' risk. These viewpoints are summarized by Solnik (1996) who indicates that definitely in the area of international investing, currency risk is considered the most important area of risk management.

3. Methodology

This section, considers the methodology adopted for the research, the data collection and measurement techniques, the models adopted and estimation. .

The deductive approach is used for this study. This approach allows for the development of a theory (theories) and hypothesis (hypotheses) and designing of a research strategy to test these as well as the anticipation of

phenomena and prediction of their occurrence (Saunders, Lewis & Thornhill, 2000).

3.1 Data Sources, Measurement and Model

The purpose of this research is to assess the impact of currency risk on investment returns on an internationally diversified portfolio. Although Epack held investments across twelve (12) African countries including Ghana for the study period, (6) six countries which had investments of less than 3 percent (average over the past seven years) were not captured individually in the model, following the intuition of Jorion (1990) that currency relevance flowed from significance of size in asset risk profile, leaving six individual countries. In order to avoid the possibility of omission bias, these other countries were captured as an average exchange rate. Following the literature, the regressors included exchange rate in the seven (7) "countries" with the interest rate (91 day Treasury bill in Ghana) and Databank Stock Index as controls for the domestic economy. The research employed monthly secondary data from 2005 to 2010. Exchange rate data for the various countries, Epack returns, and databank stock index were obtained from Databank Asset Management Ltd. compilations. Whereas, interest rates data was obtained from Bank of Ghana periodic publications.

For this study, the model is derived from the work of Adler and Simon (1986), who regressed stock returns on percentage change in exchange rates. This research will however include variables such as the 91-day T-bill rate, as a proxy for the risk free interest rate and domestic market return using the Databank Stock Index also in the spirit of Benson and Faff (2002) who incorporated the domestic market return and a risk free interest rate.

The model for the analysis is stated as follows:

$$Pepack = F (Pegypt, Pkeny, Pmau, Pmala, Pnige, Ptan, Pavex, Pirg, Pdsi)$$

Pepack is Percentage Change in Epack portfolio returns; *Pegypt* is Percentage Change in Exchange rate Egypt; *Pkeny* is Percentage Change in Exchange rate Kenya; *Pmau* is Percentage Change in Exchange rate Mauritius; *Pmala* is Percentage Change in Exchange rate Malawi; *Pnige* is Percentage Change in Exchange rate Nigeria; *Ptan* is Percentage Change in Exchange rate Tanzania; *Pavex* is Percentage Change in Average Exchange Rate of countries with less than 3% in the fund asset; *Pirg* is Domestic Interest Rate; and *Pdsi* is Databank Stock Index.

The general linear econometric model is given as:

$$Pepack = \beta_1 + \beta_2 Pegypt + \beta_3 Pkeny + \beta_4 Pmau + \beta_5 Pmala + \beta_6 Pnige +$$
$$\beta_7 P\tan + \beta_8 Pirg + \beta_9 Pavex + \beta_{10} Pdsi + \ell_t \qquad (1)$$

4. Estimation and Presentation of Results and Findings

The results of the estimations and the various diagnostic tests are presented below.

4.1 Stationarity of Variables

The monthly data were tested individually using the Augumented Dickey Fuller (ADF) Test in E-views. Most of the data were not stationary at levels and thus each series was tested at first and second difference. The order of integration is the number of unit roots contained in the series, or the number of differencing operations it takes to make the series stationary. A series is said to be stationary if the mean and autocovariances of the series do not depend on time. A differenced stationary series is said to be integrated and is denoted as I (d) where d is the order of integration. Any series that is not stationary is said to be non-stationary. The results of the test are summarised in the table 1.

Table 1. Variable definition and unit root tests

Variable	Augmented Dickey Fuller Test			
	T- statistic	Probability	Critical Value 5 percent	Order of Integration
Pepack	-4.0005	0.0025	-2.9036	I(0)
Pegypt	-4.7751	0.0002	-2.9036	I(0)
Pirg(at 1st difference)	-8.1330	0.0000	-2.9036	I(1)
Pdsi	-4.3410	0.0008	-2.9030	I(0)
Pkeny	-6.9660	0.0000	-2.9036	I(0)
Pmau	-6.9602	0.0000	-2.9030	I(0)
Pmala	-3.3835	0.0148	-2.9030	I(0)
Pnige(at 1st difference)	-8.7004	0.0000	-2.9069	I(1)
Ptan	-5.0197	0.0001	-2.9030	I(0)
Pavex	-5.3201	0.0000	-2.9030	I(0)

From the results, the exchange rate of Nigeria and domestic interest rate were stationary at first difference while the rest of the variables were stationary at order zero I(0). Given that not all the variables were stationary at levels, one is unable to use the classical general linear model. We proceed to test for co integration of the variables.

4.2 Co-integration and Error Correction Model One (ECM)

It is possible that a linear combination of two or more non-stationary series may be stationary (Granger, 1987). If such a stationary linear combination exists, the non-stationary time series are said to be co-integrated and interpreted as having a long-run equilibrium relationship among the variables. Given that the variables are of different orders of integration and particularly not stationary at levels, they violate the Engle–granger condition for co-integration which requires all the variables to be integrated of order 1 or the same order before the test can be run. However, Johansen (1988) provided a co-integration test procedure for time series variables which have either the same order or different orders of integration. Hence, we employ the Johansen co-integration test which uses the likelihood ratio of variables to determine their long term relationship. The model can only be defined if it passes the Johansen co integration test.

Table 2. Results of Johansen co-integration test

Sample: 2005M01 2010M12					
Included observations: 69					
Series: PEPACK PEGYPT PDSI PAVEX PIRG PKENY PMALA PMAU PNIGE PTAN					
Selected (0.05 level*) Number of Co integrating Relations by Model					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	4	4	5	5	9
Max-Eig	2	3	3	3	3

Note: *Critical values based on MacKinnon-Haug-Michelis (1999).

Since the results indicate a minimum rank of more than zero it could be concluded that the variables co-integrate and thus have a long-term relationship. An error correction model could be defined for the variables in the model. The Hendry type model was adopted because it provides the opportunity to examine the long-term and short-term effects of the exogenous variables on the endogenous variable. Thus, a variable may have a short-term impact on the endogenous variable but no long-term impact in the model. A Hendry type Error Correction Model is defined as follows:

$$D(Pepack) = \beta_1 + \beta_2 D(Pegypt) + \beta_3 D(Pkeny) + \beta_4 D(Pmau) + \beta_5 D(Pmala) +$$
$$\beta_6 D(Pnige) + \beta_7 D(P\tan) + \beta_8 D(Pirg) + \beta_9 (Pavex) + \beta_{10} D(ldsi) + \beta_{11} Pepack(-1)$$
$$+ \beta_{12} Pegypt(-1) + \beta_{13} Pkeny(-1) + \beta_{14} Pmau(-1) + \beta_{15} Pmala(-1) \qquad (2)$$
$$+ \beta_{16} Pnige(-1) + \beta_{17} P\tan(-1) + \beta_{18} Pirg(-1) + \beta_{19} Pavex(-1) + \beta_{20} Pdsi(-1) + \ell_t$$

Where, D is the difference operator defined by: $D(X)_t = X_t - X_{t-1}$

4.3 Results of First Run of Model

Estimation of equation 2 produced a general over-parameterized model of the Hendry type error correction model. The insignificant variables in the initial results were eliminated to arrive at a parsimonious model using the AIC and SBC as guides.

4.4 Discussion of Study Findings

As per the findings of the study, current changes in the foreign exchange rates in all the countries prove inconsequential in explaining return changes on the Epack equity mutual funds. This in consonance with Amihud (1994) and Bartov and Bodnar (1994) who found no evidence of contemporaneous currency exposure for U.S. multinationals. On the other hand, the foreign exchange rate changes in the previous periods, prove significant in explaining the performance of the fund albeit not for all the countries making up the portfolio. This is also in consonance with Bartov and Bodnar (1994) who found that U.S. firms do respond to past quarterly exchange rate movements. This might be an indication that portfolio returns only adjust to the changes in the currencies ex-post. In other words, expectations on the currency movement may influence portfolio re-compositions and ultimately their returns. By implication, it is expected that as a result of changes that may

have taken place in the foreign currency of an investment country and possibly expecting the direction of change to continue may result in the reconstitution of the portfolio and thereby affecting returns. Of course, the lag may also represent the time lag between actual occurrence and adjustments to reflect such.

Table 3. Parsimonious results of model

Dependent Variable: D(PEPACK)				
Method: Least Squares				
Sample (adjusted): 2005M02 2010M12				
Included observations: 71 after adjustments				
	Coefficient	Std. Error	t-Statistic	Prob.
C	4.675735	1.092300	4.280634	0.0001
D(PAVEX)	0.247289	0.171888	1.438667	0.1554
D(PDSI)	0.314554	0.106645	2.949537	0.0045
D(PMAU)	-0.067579	0.118067	-0.572379	0.5692
PEPACK(-1)	-1.288685	0.118492	-10.87574	0.0000
PDSI(-1)	0.258498	0.104848	2.465468	0.0166
PIRG(-1)	-0.182965	0.064980	-2.815725	0.0066
PNIGE(-1)	0.235730	0.162745	1.448462	0.1527
PAVEX(-1)	0.517679	0.194243	2.665116	0.0099
PKENY(-1)	-0.262171	0.166369	-1.575837	0.1203
DUM2	-2.776775	0.859403	-3.231051	0.0020
R-squared	0.738047	Mean dependent var		0.189437
Adjusted R-squared	0.694388	S.D. dependent var		4.669071
S.E. of regression	2.581164	Akaike info criterion		4.875882
Sum squared resid	399.7444	Schwarz criterion		5.226438
Log likelihood	-162.0938	Hannan-Quinn criter.		5.015287
F-statistic	16.90487	Durbin-Watson stat		1.930228
Prob(F-statistic)	0.000000			

The only variable that also proved significant in terms of current changes is the DSI. It can be inferred that since there was no need for currency conversions required in factoring in changes in the DSI, the changes reflect immediately, this finding is in consonance with conventional wisdom also given the weight of domestic stocks in the Epack fund (46%).

In terms of the coefficient signs, the DSI, as expected exhibits a positive sign in both cases of current changes and previous changes. By inference, current improvements in the DSI are associated with positive performance of the Epack fund and so is the lag at 1, possibly indicating some kind of persistence of the DSI's effect on the Epack fund. The risk-free interest rate, proxied by the 91-day T-Bill rate, is however, negatively influential with regard to Epack returns. This could imply that as interest rates rise, firm level investments may drop as a result rise in cost of capital, which ultimately affect the stock prices of the firms held by Epack and thereby lowering the returns of Epack. The individual country level foreign exchange rate changes also proved insignificant in explaining return movements of the Epack fund.

The *Pavex* variable, however, proved positively significant in the first lag. In other words, a deteriorating currency position (increasing 'local' currency to unit Dollar) of another foreign currency to the US Dollar, positively impacts the return on Epack. The significance of the *Pavex* variable also holds another implication, that whilst the foreign currency movements in the foreign movements may not be individually significant enough to show up, aggregation may lend weight to it for it to appear significant.

The value of the error correction factor (captured as *Epack (-1)*) -1.2887 is and it indicates the velocity by which the Epack returns will get to its long-run equilibrium when it experiences a currency shock. Given that, the model used monthly data, a currency shock will take $\left(\frac{1}{\lambda_3} \right) = \left(\frac{1}{-1.2887} \right) = 0.78\, years\, (9.4\, months)$ to restore long-term equilibrium.

From table 3, it is evident that lagged Epack returns variable (the error correcting factor) in the ECM is very significant.

4.5 Tests of Suitability and Validity

In terms of model suitability, Table 4 provides the F-Statistic, the D-W Statistic among others. To also check whether the model is well-specified or not, the Ramsey test was run.

Table 4. Ramsey test results

Ramsey RESET Test:			
F-statistic	0.609425	Prob. F(2,58)	0.5471
Log likelihood ratio	1.476580	Prob. Chi-Square(2)	0.4779

The specification test by Ramsey indicated that at 5 percent significance level, the model was well specified with the statistic of 0.55, which is greater than 0.05. Hence, accepting the null hypothesis of analysis and stating that the parsimonious model is well specified.

5. Conclusion and Policy Implications

The research concludes, based on the results obtained, that in aggregate, ccurrency risks are important in explaining the returns earned on the Epack Fund. Macroecomic conditions, interest rates specifically, also influence the investment returns. In general, shocks to the returns on the fund take 9.4 months to fizzle out. In terms of policy implication, it may well be appropriate to watch for balance in investing internationally as aggregation of the currency risks result in significant impact but zero otherwise. The study has important policy implications for international investing.

References

Addae-Dapaah, K., & Tan Yong Hwee, W. (2009). The unsung impact of currency risk on the performance of international real property investment. *Review of Financial Economic*s, *18*. http://dx.doi.org/10.1016/j.rfe.2008.04.002

Adler, M., & Dumas, B. (1984). Exposure to currency risk: Definition and measurement. *Financial Management, 13*(Summer), 41-50. http://dx.doi.org/10.2307/3665446

Andersen, T. G., Bollerslev, T., Diebold, F. X., & Labys, P. (1999). The Distribution of Realized Exchange Rate Volatility. *Journal of the American Statistical Association, 96*(453).

Anderson, S. C., & Ahmed, P. (2005). *Mutual Fund Fees and Expenses, Mutual Funds Fifty Years of Research Findings* (chapter 3). Springer.

Ang, A., & Bekaert, G. (2002). International Asset Allocation with Regime Shifts. *Review of Financial Studies*, *15*(4), 1137-1187. http://dx.doi.org/10.1093/rfs/15.4.1137

Bartov, E., & Bodnar, G. M. (1994). Firm valuation, earning expectations and the Exchange rate exposure effect. *Journal of Finance,* 1755-1786. http://dx.doi.org/10.1111/j.1540-6261.1994.tb04780.x

Bartram, S. M., & Dufey, G. (2001). International portfolio investment: theory, evidence, and institutional framework. *Financial Markets. Institutions and Instruments*, *10*(3), 85-155. http://dx.doi.org/10.1111/1468-0416.00043

Benson, K. L., & Faff, R. W. (2002). A performance analysis of Australian international equity trusts, international financial markets. *Institutions and Money, 13*, 69-84. http://dx.doi.org/10.1016/S1042-4431(02)00027-6

Bodnar, G. M., & Gentry, W. M. (1993). Exchange rate exposure and industry characteristics: Evidence from Canade, Japan and the USA. *Journal of International Money and Finance, 12*, 29-45. http://dx.doi.org/10.1016/0261-5606(93)90008-Y

Bodnar, G. M., & Wong, M. H. F. (2000). Estimating exchange rate exposure some 'weighty' issues. National Bureau of Economic Research, *Working Paper* 7497.

Bogle, J. C. (1994). Bogle On Mutual Funds New Perspectives for the Intelligent Investor (p. 28). New York: Bantam Doubleday Dell Publishing Group, Inc.

Campa, J. M., & Fernandes, N. (2006). Sources of gains from international portfolio diversification. *Journal Empirical Finance*, *13*(4-5), 417-443. http://dx.doi.org/10.1016/j.jempfin.2006.01.001

Chen, J. S., & Ang, A. (2001). Asymmetric Correlations of Equity Portfolios. *EFA 2001 Barcelona Meetings.* http://dx.doi.org/10.2139/ssrn.219495

Christopherson, J. A., & Williams, C. N. (1997). *Equity style: What it is and why it matters, in The Handbook of Equity Style Management* (2nd ed. New Hope). F. J. Fabozzi, (Ed.), PA: Frank Fabozzi & Associates.

Consumer Price Index (CPI) Newsletter March 2011. (2011). *March 2011 CPI annexes 2006-2010.* Ghana Statistical Service Publication.

Databank Epack Annual Reports

Dickey, D., & Fuller, W. (1979). Distribution of the Estimators for autoregressive time series with unit root. *Journal of the American Association, 74*. http://dx.doi.org/10.2307/2286348

Engle, R. F., & Granger, C. W. J. (1987). Coitegration and Error correction: representation, estimation and testing. *Econometrica*, *55*, Mars. http://dx.doi.org/10.2307/1913236

Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. *American Economic Review*, 71545-565.

Francis, J. C., & Archer, S. H. (1971). *Portfolio Analysis*. Prentice-Hall.

Gholamreza, M., Shamsher, M., & Taufiq, H. (2010). A review on international portfolio diversification: The Middle East and North African region. *African Journal of Business Management, 4*(19), 2.

Goetzmann, W. N., & Ibbotson, R. G. (2005). *History and the Equity Risk Premium*, pp. 9-10. Retrieved from http://www.econ.ucsb.edu/conferences/equity05/papers/Goetzmann.pdf April 14,2011

Graham, B., & Dodd, D. (1934). *Security Analysis*. New York: Mc Graw Hill.

Grauer, F. A., Litzenberger, R. A., & Stehle, R. E. (1976). Sharing Rules and Equilibrium in an International Capital Market. *Journal of Financial Economics*. http://dx.doi.org/10.1016/0304-405X(76)90005-2

Haslem, J. A. (2003). *Mutual Funds: Risk and performance Analysis for decision making* (p. 278). U.K.: Blackwell Publish Ltd.

Haslem, J. A. (2010). *Mutual Funds Portfolio Structures, Analysis, Management, and Stewardship* (pp.134-135). Hoboken, New Jersey: John Wiley & Sons, Inc.

Johansen, S. (1988). *Statistical analysis of cointergrtion vectors, Journal of economic dynamics and control*, Vol.12. Cited in Doucoure Bakary Fodiye (2004-2005) Methodes Économétriques; Cours et Travaux Pratiques; Logiciels: EVIEWS, STATA, SPSS.

Jorion, P. (1990). The Exchange rate exposure of U.S. multinational. *Journal of Business, 63*(3), 331-345. http://dx.doi.org/10.1086/296510

Khoo, A. (1994). Estimation of foreign Exchange exposure: an application to mining companies in Australia. *Journal of International Money and Finance*, *13*(3), 342-363. http://dx.doi.org/10.1016/0261-5606(94)90032-9

Kirchhoff, H. (2010). *International Currency Information*. Retrieved 7 April 2011 from http://www.ehow.com/about_6800213_international-currency-information.html

Kutty, G. (2010). The Relationship between Exchange Rates and Stock Prices: The Case of Mexico. *North American Journal of Finance and Banking Research, 4*(4), 3.

Lackman, C. L. (1996). Exchange Risk: A Capital Asset Pricing Model Framework. *Journal of Financial and Strategic Decisions, 9*(1), 1-8.

Levy, H., & Sarnat, M. (1970). *International diversification of investment portfolios*.

Levy, H., & Sarnat, M. (1970). The Benefits and Pitfalls of International Diversification. *The American Economic Review, 60*(4). 668-675.

Li, H. Y., Zhang, C., & Zhao, D. (2010). Stock Investment Analysis model Based on AHP and Gray Relational Degree. *Management Science and Engineering*, *4*, 1-6.

Maginn, J. L., Tuttle, D. L., Pinto, J. E., & McLeavey, D. W. (2007). Managing Investment Portfolios: A dynamic process (3rd ed.) (CFA Investment Institute Series, pp. 432-433).

Marcel, R. (2002). Portfolio Theory Diversification, markets for international diversification strategies. *Journal of.Financial Economics*, *50*(3), 351-373.

Miller, K. D., & Reuer, J. J. (1998). Firm strategy and economic exposure to foreign Exchange movements. *Journal of International Business Studies, 29*(3), 493-513. http://dx.doi.org/10.1057/palgrave.jibs.8490004

Mutooni, R., & Muller, C. (2007). Equity style timing. *Investment Analysts Journal*, *65*, 15-24.

Nketiah, N. K., & Amanor, S. (2011). Reducing your investment risk through diversification. *Business & Financial Times*, 24.

Richards, D. (2009). Portfolio diversification failure puts risk under spotlight. *The Globe and Mail Investor*

Magazine, 2.

Rouwenhorst, G. K. (1999). European equity markets and the EMU. *Financial Analyst Journal*, *55*(3), 57-64. http://dx.doi.org/10.2469/faj.v55.n3.2272

Saunders, M., Lewis, P., & Thornhill, A. (2000). *Research Methods for Business Students* (2nd ed.). New York: Prentice Hall.

Securities and Exchange Commission, Various Annual Reports.

Siegel, J. (2002). Stocks for the Long Run (3rd ed.). New York: McGraw Hill.

Solnik, B. H. (1995). Why Not Diversify Internationally Rather Than Domestically. *Financial Analysts Journal, 51*(1), 89-94. http://dx.doi.org/10.2469/faj.v51.n1.1864

Solnik, B. H. (1975). The Advantages of Domestic and International Diversification. In Elton, E. J. & Gruber, M. J. (Eds.), *International Capital Markets*. North-Holland.

Ward, N., & Crosby, R. (2002). Value and Growth Style Investing: Mitigating the Risk of Style Cycles, *GE Asset Management*, White paper, 1-2.

Ziobrowski, A., & Curcio, R. (1991). Diversification benefits of US real estate to foreign investors. *Journal of Real Estate Research*, *6*(2), 119-142.

Ziobrowski, A., & Ziobrowski, B. (1993). Hedging foreign investments in US real estate with currency options. *Journal of Real Estate Research*, *8*(1), 27-54.

Ziobrowski, A., & Ziobrowski, B. (1995). Hedging foreign investments in US real estate with forward contracts. *Journal of Property Valuation and Investment*, *13*(1), 22-43. http://dx.doi.org/10.1108/14635789510077278