

THE EXPLORATION OF DIVERSIFICATION BENEFITS  
OF EMERGING MARKETS

by  
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## ABSTRACT

This paper explores whether American investors receive greater diversification gains through portfolios comprising solely of emerging market securities, United States securities, or a portfolio combining emerging market and United States securities. According to popular thought, emerging markets provide international diversification benefits to United States investors through their high returns, high volatilities, and low correlations to developed markets. This popular school of thought is highly debated due to the globalization of world markets and trade liberalization of emerging markets. Additionally, the United States investors face investment barriers and additional risks, such as political and currency risk. As emerging markets mature and develop, United States investors may not receive sufficient diversification gains from holding emerging market securities. This paper will assess the risk-to-return profiles of three different portfolio strategies and analyze the trends in correlation between world financial markets.

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## INTRODUCTION

In recent years, U.S. (domestic) investors have increasingly included emerging market securities into their equity portfolios (Bekaert, 1993; Park & Agtmael, 1993). U.S. investors have increasingly looked at emerging markets as a potential source and provider of diversification gains for their domestic portfolios (Arora, Jain, & Das, 2011). In the past twenty years, the gross domestic products of emerging markets have experienced tremendous growth and have grown at twice the rate than that of the developed and industrial economies (Barry, Peavy III, & Rodriguez, 1998; Arora, Jain, & Das, 2011; Barry & Rodriguez, 2004). From 1983 to 1995, the emerging markets' market capitalization grew from \$167.7 billion to \$1.9 trillion (Barry, Peavy III, & Rodriguez, 1998).

Emerging markets are characterized by their high returns, high growth, and high volatilities as well as their ability to reduce risks in equity portfolios (Vedd & Vedd, 2013). Historically, emerging markets have had low correlations with developed markets (Vedd & Vedd, 2013). It is these high returns and low correlations that allow emerging markets the ability to provide diversification benefits to domestic investors (Arora, Jain, & Das, 2011). According to Phengpis and Swanson (2004) and Markowitz (1952), modern portfolio theory suggests that U.S. investors can achieve international diversification gains by combining U.S. stocks with emerging market stocks. Modern portfolio theory suggests that emerging markets are able to increase the expected returns for the same level of risks when maintaining an international portfolio (Phengpis & Swanson, 2004). However, the emerging markets and their role in international diversification has been a source of controversy in the past few years. Some scholars believe that the integration between world financial markets is increasing, resulting in higher correlations between emerging and developed markets (Haque

& Kouki, 2010). These increases in co-movement between securities decrease the emerging markets' abilities to reduce risk for a domestic investor.

According to Yorulmaz (2011), the interdependency and interaction between emerging and developed markets is the main cause of global portfolio diversification. However, economies are becoming more integrated as a direct result of globalization (Yorulmaz, 2011). As a result, Kumar (2012) asserts that the increasing integration between equity markets reduces U.S. investors' ability to reduce risks in their portfolios. In addition to the increasing levels of co-movement between financial markets, Kumar (2012) states that investors should consider the additional risks that accompany emerging markets, such as political and exchange rate risks, before incorporating emerging markets into domestic investors' portfolios.

Due to the varying literature behind emerging markets and their ability to generate diversification benefits, this study assembles the risk-to-return profiles of a sample set of emerging markets, developed markets, and an artificially created portfolio, composed of both emerging and developed markets. The risk-to-return profiles of emerging markets are compared in an attempt to answer whether or not U.S. investors are better off investing in either a purely domestic portfolio or an equally weighted portfolio of both emerging and developed markets. The subsequent section provides the objectives of the study. Section 3 provides a summary of the previous research on the subject of international diversification. Section 4 describes the hypotheses formed after reviewing previous literature. Section 5 describes the data gathered while Section 6 describes the methodology adopted in this study. Section 7 presents the results and the concluding remarks are expanded upon in Section 8.

### RESEARCH QUESTION

The main objective of international diversification is to provide an opportunity to increase portfolio performance by incorporating international securities, which have low correlation, into the portfolio securities (Haque & Kouki, 2010). However, there is a gap in the literature regarding emerging markets and their true ability to provide diversification benefits to U.S investors. The suggestion that emerging markets and developed markets are losing their low correlation coefficients, which are attributed to globalization and trade liberalizations, suggests that emerging market have lost their ability to reduce risks for domestic investors. The increases in market correlations spur the controversy that surrounds the previous theory of emerging markets and international diversification.

Due to the controversial literature regarding emerging markets and their ability to generate diversification benefits, this paper attempts to determine whether U.S. investors receive diversification gains from holding an international portfolio composed of developed and emerging market securities and whether the correlations between world financial markets have risen or decreased in the past 20 years. Specifically, this study attempts to determine whether U.S. investors receive higher return-to-risk ratios by holding either a well-diversified domestic portfolio or an international portfolio composed of emerging market and developed market securities. The results of the study will allow U.S. investors and academics to ascertain the historical diversification gains emerging markets have provided, the correlation trends between world financial markets, and aid U.S. equity investors in their portfolio selection decisions.



## LITERATURE REVIEW

Investors view emerging markets as an important asset class due to the potential benefits these capital markets provide foreign investors (Barry, Peavy III, & Rodriguez, 1998). Emerging markets are typically characterized by their high stock returns and high volatilities (Barry, Peavy III, & Rodriguez, 1998). In addition to these characterizations, Rashima Vedd and Paul Lazarony (2014) suggest that the typically low correlations, associated between emerging markets and developed markets, have the ability to reduce portfolio risks and increase the expected returns of a well-diversified portfolio (Vedd & Lazarony, 2014). Therefore, there has been an increasing level of interest by international investors who are seeking investment opportunities in emerging markets in order to obtain diversification benefits by diversifying their asset holdings in their portfolios (Arora & Jain & Das, 2011). Diversification is the technique used to minimize an investor's portfolio risk while maximizing expected portfolio returns by constructing a portfolio that incorporates a wide variety of assets (Mangram, 2013). Modern Portfolio Theory (MPT) is the investment framework that incorporates portfolio diversification and provides a model for portfolio selection (Mangram, 2013).

### **Modern Portfolio Theory and Diversification**

MPT is a normative theory that provides the “investment framework for the selection of investment portfolios based on the maximization of expected returns of the portfolio and the simultaneous minimization of investment risk” while selecting the appropriate proportions of assets (Mangram, 2013; Fabozzi, Gupta, & Markowitz, 2002). In Harry Markowitz's 1952 dissertation, *Portfolio Selection*, he states that a core concept of MPT is portfolio diversification (Mangram, 2013). According to Mangram (2013) and Bodie, Kane,

and Marcus (2011), portfolio diversification is the method investors use to minimize the effects of an individual asset performance while maximizing expected returns and use to try to reduce their exposure to nonsystematic risk which are micro-level risks that affect a certain asset or asset group (Mangram, 2013; Bodie, Kane, & Marcus, 2011). In portfolio diversification, the investor has the opportunity to reduce unsystematic risk by hold a variety of assets yet the investor will not be able eliminate the systematic risk (or market risk), which is the risk that is reflected on market-wide assets (Bodie, Kane, & Marcus, 2011). Thus, Rim and Setaputra (2012) found that investors are able to minimize their portfolio's systematic risks by holding positions in emerging markets due their low correlations to U.S stock indices and different market risks. Price (1994), Stanley (1995), Barry and Lockwood (1995), Barry et al. (1998), and Arora et al. (2011) also found that the low correlations between emerging markets and developed markets indicate opportunities for diversification for investors of developed markets.

The main benefit of international diversification is that investors are able to increase returns and decrease risks by holding varying assets that react differently to a given event. Mangram (2013) provides the following example of how diversification works:

Negative news related to the European debt crisis generally causes the stock market to move significantly lower. At the same time, the same news has had a general [positive] impact on the price of certain commodities such as gold. (p.66)

In order to maximize the benefits of diversification, Mangram (2013) suggests that investors not only should invest in different stocks within an industry but also invest in multiple asset classes, such as: stocks, bonds, and commodities. It is important to note that diversification

can reduce some risk however, it is almost impossible to eliminate all risks|  
(Mangram, 2013).

### Portfolio Selection: Efficient Frontier of Risky Assets

Modern Portfolio Theory also provides a model for portfolio selection by incorporating the concept of the efficient frontier and the mean-variance frontier (Mangram, 2013)(Bodie, Kane, & Marcus, 2011). Several dissertations use the efficient frontier and the mean-variance frontier to discover the possible diversification effect. Since the main objective behind diversification is to minimize risks and maximize returns, analysts and investors employ the minimum-variance frontier as the first step in international portfolio selection. According to Bodie et al. (2011), the mean-variance frontier of risky assets is a graph that displays the “lowest possible variances for a given portfolio expected return” (p. 211). Figure 1 displays an example of the minimum-variance frontier.

Figure 1: The minimum-variance frontier of a risky asset. (Bodie, Kane, and Marcus, 2011)

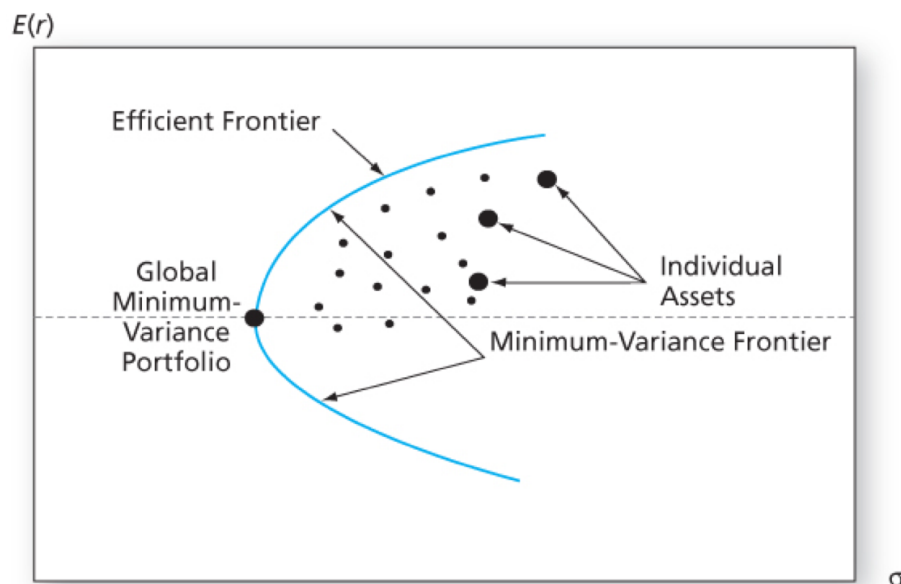
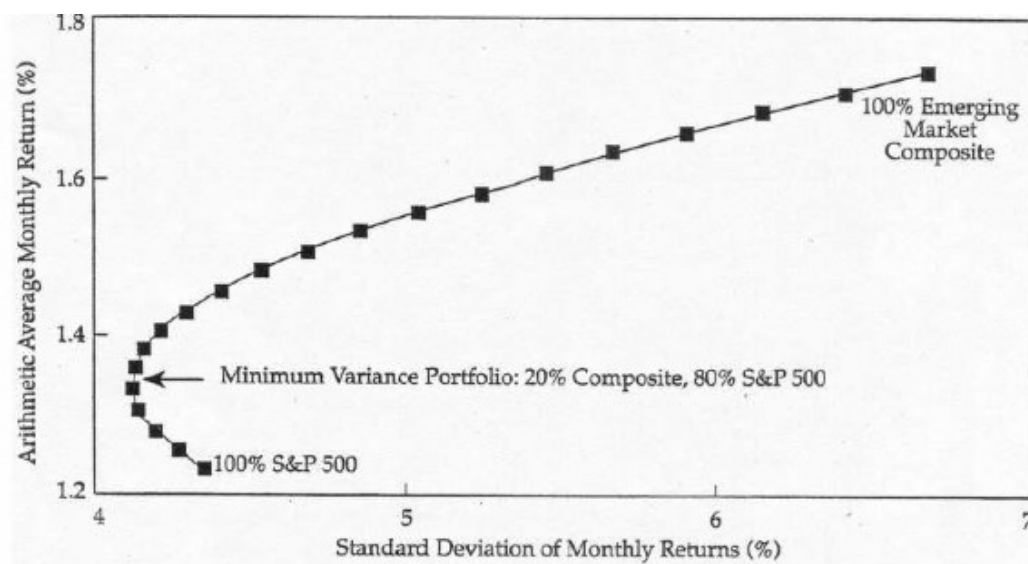


Figure 1 shows the benefits investors obtain from holding portfolios rather than individual assets since a diversified portfolio allows investors to increase their expected return while minimizing the standard deviation and signifies the best possible risk-return combination (Bodie, Kane, & Marcus, 2011). Bodie et al. (2011) the portion of the curve that is above the “global minimum- variance portfolio” provides the best risk-to-reward trade off and symbolizes the best optimal portfolios; this portion of the frontier is called the efficient frontier of risky assets (Mangram, 2013). The portfolio selection theory states that the typical investor will seek a portfolio combination that is located on the efficient frontier, therefore allowing investors to select a portfolio that will maximize their expected return for their individualized assignment of acceptable risk (Pfau, 2011).

The efficient frontier of risky assets supports the main objective of the diversification by selecting the optimal portfolio that generates the highest expected return for the lowest amount of investment risk. Phengpis and Swanson (2004) used the international efficient frontier to find that by combining U.S. stocks and foreign stocks, U.S. investors could gain international diversification benefits (Arora, Jain, & Das, 2011). Barry *et al.* (1998) also found through the minimum-variance frontier, that the combination of emerging market securities and the S&P 500 created a less risky portfolio than that of a portfolio composed solely of US stocks. According to Barry et al. (1998), Figure 2 depicts the portfolio consisting solely of U.S. securities is considered inefficient since it is located on the portion of the efficient frontier that is located below the minimum-variance frontier.

Figure 2. “Portfolio Combination of the Emerging Market Composite Index and the S&P 500, 1985-95” (Barry, Peavy III, and Rodriguez, 1998)



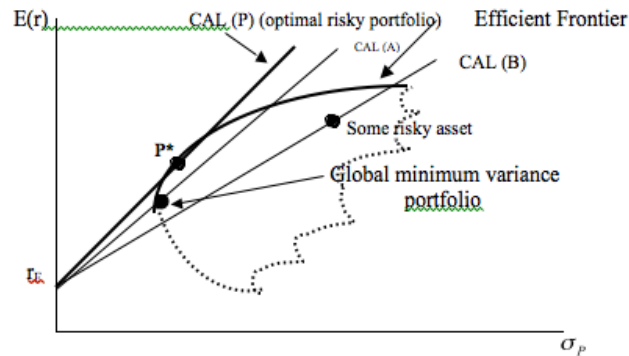
The international efficient frontier and optimal portfolio theory are not the only methods used to discover possible diversification opportunities when investing in emerging markets.

### Sharpe Ratio

The Sharpe ratio is another method of analyzing the possible diversification benefits for portfolios and the selection of portfolios (Mangram, 2013). Mangram (2013) asserts that the Sharpe ratio stems from Markowitz’s work on portfolio selection and portfolio diversification. The Sharpe ratio measures the excess return for a given risk per unit (Sharpe, 1994; Johnston, Hatem, & Scott, 2011). This ratio is an assessment of the trade-off between expected return and risk (Maller, Durand, & Jadarpour, 2010). Bodie et al. (2011) define the capital allocation line (CAL) as the graph that portrays the different “feasible risk-return combinations of risky and risk-free asset” (p. G-2). Therefore, the Sharpe ratio is the slope of the CAL, which “combines the T-bill and minimum variance portfolio” (Bodie, Kane, & Marcus, p. 206). The main objective of the Sharpe ratio is to select the CAL with the greatest

slope for any given portfolio (Bodie, Kane, & Marcus, 2011). Figure 3 provides an example of the maximizing CAL for portfolio P.

Figure 3: Maximizing CAL (Bodie, Kane, and Marcus, 2011)



In Figure 3, the optimal CAL is CAL (P) due to its ability to maximize the greatest return-to-risk ratio for the portfolio of risky assets and risk-free asset. After discovering the Sharpe ratio for a given portfolio, it is up to the individual investor to decide the specific weights to assign each risky asset in the given optimal portfolio (Bodie, Kane, and Marcus, 2011). The determination of assigned weights for the different asset types depends on the investor's degree risk aversion,  $A$ , which is the acceptable trade-off between reward and risk an investor is willing to undertake (Pfau, 2011). The following equation is the Sharpe ratio:

$$S_p = \frac{E(r_p) - r_f}{\sigma_p}$$

Where:

$E(r_p)$  = the Excess return of the portfolio

$r_f$  = rate of return for the risk free asset (such as t-bills)

$\sigma_p$  = standard deviation of the portfolio

Equation 1

While the following equation incorporates an investor's degree of risk aversion,  $A$ , and solves for the weight that will be assigned to risky assets (Pfau, 2011).

$$y = \frac{E(r_p) - r_f}{A \sigma_p^2}$$

Where:

$E(r_p)$  = the Excess return of the portfolio

$r_f$  = rate of return for the risk free asset (such as t-bills)

$\sigma_p$  = standard deviation of the portfolio

$A$  = the coefficient of risk aversion

Equation 2

The use of the Sharpe ratio allows analysts and investors to determine which combination of risky assets and risk-free assets will allow them obtain the highest degree of risk-to-return for their investment. Specifically, Meric, Leal, Taner, and Meric (2001) used the Sharpe ratio to discover that there were “decreasing diversification benefits for U.S. investors investing in Latin American [emerging] capital markets due to an increase in correlations between the developed markets and emerging markets after the 1987 [US] stock market crash” (p. 232). While Arora et al. (2011) used the Sharpe ratio to find that their sample of emerging markets offered more appealing risk-adjusted returns than that of developed markets and showed positive signs for portfolio diversification (p. 743). The research behind the ability of emerging markets to provide diversification benefits is controversial and can be analyzed either by the conduction of optimal portfolio theory or by employing the Sharpe ratio.

### **Market Integration**

Emerging markets are thought to provide diversification benefits to international investors through their historically low correlations to developed capital markets. According to Mangram (2013), the “correlation coefficient [of returns] is a measure of risk to volatility

and measures the degree to which two variables are related” (p. 65). Through correlation analysis, analysts and investors have seen a trend of increasing global market integration between the emerging and developed markets (Vedd & Lazarony, 2014). Vedd et al. (2014) suggest that higher correlations between emerging and developed markets are a result of growing emerging markets and the development of financial and trade links between world markets (p. 93). The higher correlations between emerging markets and the developed markets decrease the potential gains investors can receive through international investments (Vedd & Lazarony, 2014). Specifically, the higher correlations might result in the decrease of risk reduction in an international portfolio (Vedd & Lazarony, 2014).

The data behind the degree of international integration and co-movement is highly debated. Vedd and Lazarony (2014) argue that although the global markets are becoming more connected and integrated, the emerging markets’ perceived barriers to investment mitigates the integration between the emerging markets and the developed markets thus maintaining the low correlation factors between these capital markets (pg. 94). These low correlation factors allow investors to benefit from increasing their chances of receiving higher returns (Vedd & Lazarony, 2014). Rim and Setaputra’s (2012) research supports the findings of Vedd and Lazarony (2014) and support the idea that investing in emerging markets during times of crisis has the potential to increase the gains investors can receive due to the lack of integration between markets (p. 110). Meanwhile, Wang and Bilson (2013) suggest that market integration results in an increase in the correlation coefficients between returns and results in a higher chance of a “contagious crisis” in all markets (p. 7631). Furthermore, Wang and Bilson (2013) also state that the benefits of international diversification in the long run might be overstated as markets become increasingly integrated



(p. 7634). Similarly, Haque and Kauki (2010) found that during the last decade capital markets have in fact become more integrated therefore, market integration decreased investors' opportunity to reduce diversification benefits due to market movements (p. 6613). Congruently, Meric, et al. (2001) found that the correlations between markets are rising and there is not a significant difference between a well-diversified portfolio composed of all US stocks and that of a well-diversified portfolio composed of US and Latin American stocks (p. 219). Currently, there is not a universal thought as to whether the amount of market integration between capital markets decreases or increases investors' ability to receive diversification benefits. However, an investor seeking international or emerging market investment opportunities should not ignore the trend in market integration since it might have an effect on the correlations between capital markets.

### **Investment Barriers**

According to Barry et al. (1997), investors seeking to invest in emerging markets are faced with different risks and investment barriers than those presented by the United States capital market or that of other developed markets. Although many emerging markets have gone through different degrees of market liberalization, which also impacts the degree of correlation between these emerging and developed markets, emerging markets still present investments barriers to the U.S. investor.

Geert Bekaert (1993) presents three different types of investment barriers that international investors are faced with when attempting to invest in emerging markets (p. 77). The three types of barriers are the legal barriers, indirect barriers, and the emerging-market-specific risks (EMSRs) (Bekaert, 1993,p. 77). The legal barriers are composed of the different legal laws and regulations between the foreign and domestic investor (Bekaert,

1993). The indirect barriers are the differences between available information, specifically the differences in accounting standards and investor protection laws (Bekaert, 1993). Meanwhile, Bekaert (1993) defines the EMSRs as the “liquidity risks, political risk, economic policy risk, macro-economic instability, and currency risk” that are present when investing in emerging markets and are a direct result from the emerging market’s individual investment policies (p.77)(Levy & Sarnat, 1978). Due to the many investment barriers presented by emerging markets, Bekaert (1993) suggests that US investors take these barriers and risks into consideration when deciding whether to invest in emerging markets since this will affect the volatility of returns and yield of returns. Barry et al. (1997) suggest that investors look into buying shares of professionally managed funds that specialize in the desired emerging market, closed-end funds, in order to alleviate some of the costs of gathering information required to overcome the barriers of investment and risks associated with emerging markets (p. 41). However, Barry et al. (1997) state that investors should be aware that a decision to invest in emerging market closed-end fund or directly in the desired emerging market might incorporate a trade-off between the amounts of diversification benefits the investor is seeking and the reduction of transactions costs (Barry, Peavy III, & Rodriguez, 1997). Therefore, the decision to invest in emerging markets should include an analysis of an individual investor’s risk aversion and the amount of information the individual investor can gather on the desired emerging market.

### **Literature Review Conclusion**

The research behind the diversification benefits of incorporating emerging markets into domestic investors’ portfolio is controversial. Historically, the high returns, high volatility, and low correlations between emerging and developed markets provided domestic

investors the opportunity for diversification benefits by maximizing returns while minimizing risk for a given level of risk (Barry, Peavy III, & Rodriguez, 1997) . However, the globalization of markets, the increase of financial and trade links between markets, and emerging market liberation has resulted in a possible increase in market integration and increases in the degree of correlation between emerging and developed markets (Haque & Kauki, 2010). These increases in correlations have been the subject of much debate regarding its impact on international diversification of portfolios. Due to the disputed impact of market integration, investors should consider the correlation factors, potential investment barriers in the emerging markets, and the potential transaction costs of emerging markets before executing trades and holdings (Barry, Peavy III, & Rodriguez, 1997). The following sections include an analysis of the potential diversification effects of holding portfolios composed of major emerging markets.

### HYPOTHESES

Barry et al. (1997) state the emerging markets are commonly characterized by high returns and high volatility. Furthermore, the typically low correlations associated with emerging markets and developed markets gave breath to the theory that emerging markets have the ability to provide diversification benefits to investors of developed markets. However, as previously mentioned, Vedd and Vedd (2013) recapitulate the idea that there has been a debate regarding the sustainability of international diversification. International diversification is possible due to the degree of market segmentation however, as trade liberation occurs and as of globalization continues, the degree of market segmentation diminishes and increases the correlation between emerging and developed financial markets (Vedd & Vedd, 2013). Yet, Drummen and Zimmermann (1992), Speidell and Sappenfield

(1992), Errunza (1994), and Littell (1997) found that emerging markets' correlations have stayed low regardless of the increase in globalization and trade liberalization. The previous research is controversial as to whether emerging markets can actually provide diversification benefits to international investors. This study's literature review predicts that the diversification benefits provided by emerging markets have diminished for the U.S. investors because of the increasing integration of world financial markets and the correlation factors between the United States and emerging markets have risen.

Hypothesis 1: United States investors do not receive a diversification benefit from investing in an equally weighted international portfolio composed of both emerging markets and developed markets.

Hypothesis 2: United States investors receive a diversification benefit from investing in a well-diversified domestic portfolio.

Hypothesis 3: The correlations between emerging financial markets and developed financial markets have risen.

The previous hypotheses will be accepted or rejected in a subsequent section of this study and will help assess whether or not there have been changes in the portfolio selection theory in regards to international diversification.

## DATA AND METHODOLOGY

In order to accept or reject the previous hypotheses, this study examined the historical returns, volatilities, and correlations between a sample of emerging and developed markets.

## Data

This study used a sample of developed and emerging market indices of economies in order to evaluate the possible benefits U.S. investors might be able to gain through the inclusion of emerging market stocks in their portfolios. The selection of indices was based off of the ISHARES Morgan Stanley Capital International (MSCI) Developed and Emerging Market Indices. The emerging market sample set is composed of the BRIC indices as well as eight other top emerging markets. The specific emerging markets included in the sample set are Brazil, China, Chile, India, Korea, Mexico, Peru, Philippines, Russia, Taiwan, Thailand, and Turkey. These emerging market indices were selected based off which indices had historical prices listed for the longest duration of time and time period for each emerging market. The emerging market sample set covers a time period from 1993 till the beginning of 2014.

The indices that make up the developed markets in this study's sample set are Australia and the United States, which are represented by the indices EWA (ISHARES MSCI Australia Index Fund) and SPY (S&P 500), respectively. The S&P 500 index was selected as the benchmark for comparison against the emerging markets in order to contrast the performance of emerging markets against an assigned benchmark, which is assumed to be the most likely to represent the performance a United States investor might be able to earn while holding a well-diversified domestic portfolio.

The data set for each of the fourteen markets are composed of the weekly, monthly, and yearly adjusted closing prices for the data period of January 1, 1993 to March 1, 2014. The adjusted closing prices for each index were found on Yahoo Finance, which were

reported in U.S. dollars. Table 1 represents the markets included in the sample, the indices that represent each market, and the data time period.

Table 1. Countries, Index Tickers, and Time Periods Covered in the Study

Country	Index	Data Period
Australia	EWA	1996-2013
Brazil	EWZ	2001-2013
China	FXI	2005-2013
Chile	ECH	2008-2013
India	PIN	2009-2013
Korea	EWY	2001-2013
Mexico	EWV	1997-2013
Peru	EPU	2010-2013
Philippines	EPHE	2011-2013
Russia	RSX	2008-2013
Taiwan	EWT	2001-2013
Thailand	THD	2009-2013
Turkey	TUR	2009-2013
U.S.A	SPY	1993-2013

The weekly-, monthly-, and yearly-adjusted closing prices were used to calculate the monthly and yearly returns for each stock; the monthly and yearly returns represent the historical returns for each market. In order to more accurately calculate each market return and trend of co-movement, monthly and yearly data were employed instead of daily prices in the effort to reduce the noise typically found in daily returns (Arora, Jain, & Das, 2011; Meric, Leal, Ratner, & Meric, 2001).

## Methodology

### Return

In order to calculate the monthly returns for each emerging and developed markets, the weekly, monthly, and yearly stock market returns were calculated by the following equation (Arora & Jain & Das, 2011):

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \quad \text{Equation (3)}$$

where  $R_t$  equals the weekly, monthly, or yearly stock returns,  $P_t$  is the adjusted closing price for a stock at the end of a week, month, or year, and  $P_{t-1}$  is the adjusted closing price of a stock for the preceding week, month, or year. Once the monthly and yearly market returns were calculated, both the average monthly and yearly returns were calculated by employing the following equation for each market:

$$\bar{r} = \frac{1}{n} \sum_{i=1}^n r_i = \frac{1}{n} (r_1 + \dots + r_n) \quad \text{Equation (4)}$$

where the average return, also represented as  $\mu$ , is the average return,  $n$  is the number of periods represented,  $r_1$  is the return for time period one, and  $r_n$  is the return for the last data period covered in the equation. The average index returns for each country were assumed to represent the average market return for each separate economy.

### Excess Return

This study makes the assumption that the U.S. investor acts rationally and assumes that each investor would choose to allocate funds in the portfolio in which the U.S. investor would assume the highest risk-to-reward ratio available. In addition, the study also makes the assumption that investors require returns greater than the returns provided by risk free

securities, such as T-Bills. Therefore, it is assumed that investors would take into consideration the excess returns that each emerging market and developed market produced when deciding which securities to hold positions in. The excess return for each market is the difference between the actual return of a risky asset and the actual risk free rate (Bodie, Kane, & Marcus, 2011). The actual annual risk free rate is calculated by obtaining the reported FRED St. Louis 3-month T-bill yearly returns and dividing by 100 to get the T-bill yield. Then the excess returns are calculated as:

$$\text{Annual T-Bill yield} = \text{reported returns (by FRED)}/100$$

$$\text{Monthly T-Bill Yield} = (\text{reported returns}/12)/100$$

$$\text{Excess return} = \text{Raw returns} - \text{T-bill yields}$$

Equation 5

The monthly T-Bill yield is reported as annual whole numbers therefore, it is necessary to divide the reported number by twelve to make it a monthly number and then divided by one hundred to make it a monthly percent. Congruently, the annual T-Bill yield is also reported as annual whole numbers, thus the necessity to divide by one hundred arises. Due to the assumed rationality of investors, investors require higher rates of returns for risky assets than the risk free rate. If the rates of returns were less than the risk free rate, investors would choose to allocate their assets into risk free securities because they would know with high certainty that they would be able to earn that risk free rate until maturity (Bodie, Kane, & Marcus, 2011). Thus, this study uses the excess returns when calculating the Sharpe ratio.

## **Risk**

The standard deviation is a measure of risk and is represented by the symbol  $\sigma$  (Bodie, Kane, & Marcus, 2011; Arora, Jain, & Das, 2011). The standard deviation measures the degree of dispersion the expected (average) rates of return deviate from the securities



mean. A higher standard deviation signifies the more volatile the returns are for a certain security and serves as an indicator of risk. Standard deviation is the square root of the variance, which is the “average squared difference between the actual returns and the average return” (Mangram, 2013, pg 63) (Bradford, J. & Miller, T., 2009; Ross, Westerfield & Jaffe, 2002). The standard deviation of excess returns is calculated for every developed and emerging market index in order to assess the reward-to-volatility ratio.

### Sharpe Ratio

The Sharpe Ratio, also known as the risk-to-volatility ratio, is a measure of the risk-to-return tradeoff and suggests that the level of attraction of an asset and portfolio selection depends on the tradeoff between the risk premium and the standard deviation of excess returns (Bodie, Kane, & Marcus, 2011; Bekaert, 1995). The Sharpe ratio is computed as follows:

$$S_p = \frac{\mu - r_f}{\sigma_{\text{excess returns}}}$$

Equation 6

where  $S_p$  is the risk-to-volatility ratio,  $\mu$  is average return for a market,  $r_f$  is the average risk free rate, and  $\sigma_{\text{excess returns}}$  is the standard deviation of excess returns. In other words, the Sharpe ratio is the excess return, average return minus the average risk-free rate, divided by the standard deviation of excess return. The Sharpe ratio has the ability to test the possible diversification gains since it looks at the ratio of risk to reward (Arora & Jain & Das, 2011). Specifically, the Sharpe ratio has the ability to test diversification gains form emerging markets since emerging markets are characterized by their high returns and high volatility. Rational investors would select the portfolio with the highest Sharpe ratio since the Sharpe

ratio signifies which portfolios have the highest return for a given level of risk. Therefore, the Sharpe ratio describes how investors actually behave and influences investors' portfolio selection process (Mangram, 2013).

### **Constructing an Equally Weighted Portfolio**

In order to analyze whether or not there is a diversification benefit from investing in solely emerging market securities, solely domestic market securities, or a portfolio of composed of both markets, it is necessary to compare the three different types of portfolios together. Therefore, this study compared the developed markets' Sharpe ratios and emerging markets' Sharpe ratios to the Sharpe ratio of an equally weighted portfolio composed of all twelve sample emerging markets and the two sample developed markets. The assumption behind the equally weighted portfolio is that an investor allocates the same proportion of assets to each market. The following equation computes the rates of return for an equally weighted portfolio:

$$E(r) = \sum w_i r_i$$

Equation 7

where  $E(r)$ , the return, equals the sum of the weights assigned to each security in the portfolio times the average return of each security. In addition, the average returns, excess returns, standard deviations, and Sharpe ratios were calculated for the equally weighted portfolio as mentioned in Formulas 1-6.

### **Construction of an 80/20 Portfolio**

This study's main objective is to determine whether or not U.S. investors receive a diversification benefit from the inclusion of emerging markets into their portfolio. Specifically, this paper explores whether a U.S. investor would receive higher diversification

gains through a well-diversified portfolio or an artificially created equally weighted portfolio composed of emerging markets and developed markets. However, this paper also determines the risk-to-return profile of a portfolio composed of 20% of the emerging market and 80% of the equally weighted portfolio in order to determine whether or not U.S. investors receive a higher degree of diversification benefits through different portfolio compositions. The selection of an 80/20 portfolio was based off the research of Barry et al. (1997), which they found the optimal portfolio structure for a U.S. investor was a portfolio that composed of 80% S&P 500 securities and 20% emerging market composite indices (see Figure 1 to see Barry et al.'s (1997) optimal portfolio structure). Therefore, this study uses their findings to determine whether different portfolio weights generate significant differences in the Sharpe ratios and degree of diversification benefit over the 1993-2014 time period.

### **Correlation Coefficient**

The last risk-to-volatility measure employed in this study is the correlation coefficient, also known as correlation. Specifically, correlation measures the degree to which two variables move together and are related. According to Mangram (2013), the correlation coefficient is computed by dividing the covariance, the extent to which the prices of two securities move in conjunction to each other, of a pair of securities by the standard deviation of the two securities (pg 65). The correlation produces a result between the ranges of +1 and -1. A positive one correlation means that the two securities returns move in a positive relationship and in the same direction. Meanwhile, the perfect negative correlation signifies that the two securities move in opposite directions. In terms of portfolio selection, Bodie et al. (2011) states that portfolios with “less than perfectly correlated assets offer better risk-to-return opportunities than the individual component securities on their own” due to the greater

potential for risk reduction (pg. 201). Thus, the correlation coefficient is an important measure of potential diversification benefits as it describes the relationship between securities. An analysis of the correlations between emerging markets and developed markets has the ability to inform international investors of risk reduction opportunities if the developed and emerging market have a low correlation coefficient however, if the emerging and developed markets have a high correlation, the high correlation would signify a possible reduction of the diversification benefits since.

The analysis of the historical Sharpe ratios for each market and the equally weighted portfolio allows investors the opportunity to analyze and compare the different return-to-risk characteristics of each type of portfolio. Ultimately, the decision to invest in a solely domestic, emerging market or equally weighted portfolio depends on the individual investors' degree of risk aversion. However, the assumption throughout this study is that a typical investor will chose a portfolio that allows the investor to maximize his or her own their returns while minimizing his or her own their exposure to risk, thus selecting the portfolio that produces the highest Sharpe ratio, risk-to-volatility measure. An assessment of each of the different portfolio compositions is made by comparing the Sharpe ratios of each emerging market, developed market, and an equally weighted portfolio. The portfolio that produces the highest Sharpe ratio indicates higher diversification effects and signals a greater risk reduction for a given level of return.

## RESULTS

### **Average Returns**

The emerging markets are characterized for their relatively high returns and are one of the main reasons why international investors consider holding positions in emerging

market securities. Both Table 2 and Table 3 show the annual average returns and monthly average returns, respectively.

Table 2: Historical Annual Average Returns

Country	Index	Data	
		Period	Average Annual Return
Australia	EWA	1996-2013	8.14%
Brazil	EWZ	2001-2013	19.86%
China	FXI	2005-2013	15.01%
Chile	ECH	2008-2013	7.94%
India	PIN	2009-2013	13.29%
Korea	EWY	2001-2013	18.96%
Mexico	EWV	1997-2013	16.46%
Peru	EPU	2010-2013	5.78%
Philippines	EPHE	2011-2013	10.86%
Russia	RSX	2008-2013	10.81%
Taiwan	EWT	2001-2013	6.55%
Thailand	THD	2009-2013	28.83%
Turkey	TUR	2009-2013	23.48%
U.S.A	SPY	1993-2013	10.88%
Equally Weighted Portfolio	N/A	1993-2013	14.32%
80% S&P 500, 20% Equally Weighted Portfolio	N/A	199-2013	11.57%

Table 3: Historical Monthly Average Returns

Country	Index	Data	
		Period	Average Monthly Return
Australia	EWA	1996-2014	0.94%
Brazil	EWZ	2000-2014	1.22%
China	FXI	2004-2014	1.15%
Chile	ECH	2007-2014	0.20%
India	PIN	2008-2014	0.02%
Korea	EWY	2000-2014	1.18%
Mexico	EWV	1996-2014	1.30%
Peru	EPU	2008-2014	0.93%
Philippines	EPHE	2010-2014	1.08%
Russia	RSX	2007-2014	0.21%
Taiwan	EWT	2000-2014	0.31%
Thailand	THD	2008-2014	1.10%
Turkey	TUR	2008-2014	0.45%
U.S.A	SPY	1993-2014	0.82%
Equally Weighted Portfolio	N/A	1993-2014	1.05%
80% S&P 500, 20% Equally Weighted Portfolio	N/A	1993-2014	0.86%

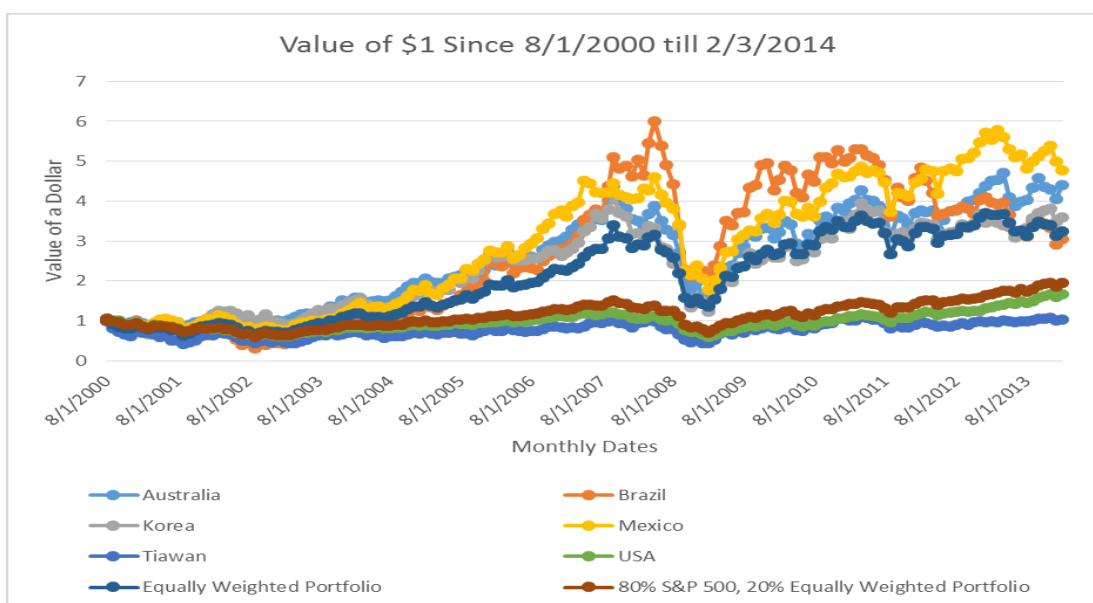
Overall, both the average yearly and monthly historical returns are congruent with the general characterization of the typically high returns that accompany emerging markets. The return analysis highlights seven emerging markets that have higher returns than that of the U.S market from the data period 1993-2014. The United States market provided an average annual historical return of 10.88%. Yet, 58% of the emerging markets provided a return greater than that of the U.S. market. The annual returns for the emerging markets range from 7.78% to 28.83%. The historical returns found in this study correspond to the general findings of other research in which they have found emerging markets to outperform the developed financial markets in terms of historical returns. The equally weighted portfolio, which distributes an equal amount of funds to each of the emerging and developed markets, had an annual average return of 14.32%. The equally weighted portfolio underperformed six of the emerging markets yet over performed both the developed markets, specifically, the

United States and Australia. The 80% equally weighted portfolio and 20% emerging market portfolio outperformed the United States portfolio by obtaining a yearly return of 11.57% and a monthly return of .86%. Although the 80%& 20% portfolio outperformed the United States portfolio, the 80% and 20% portfolio still underperformed seven of the emerging markets. The comparison of the different types of portfolios performance in terms of average returns indicates that the emerging markets have historically outperformed the developed markets as well as the equally weighted portfolio. Investors require the emerging markets to produce greater returns than risk free assets or domestic assets in order to compensate them for additional risks that accompany emerging markets.

### Compound Rate of Return

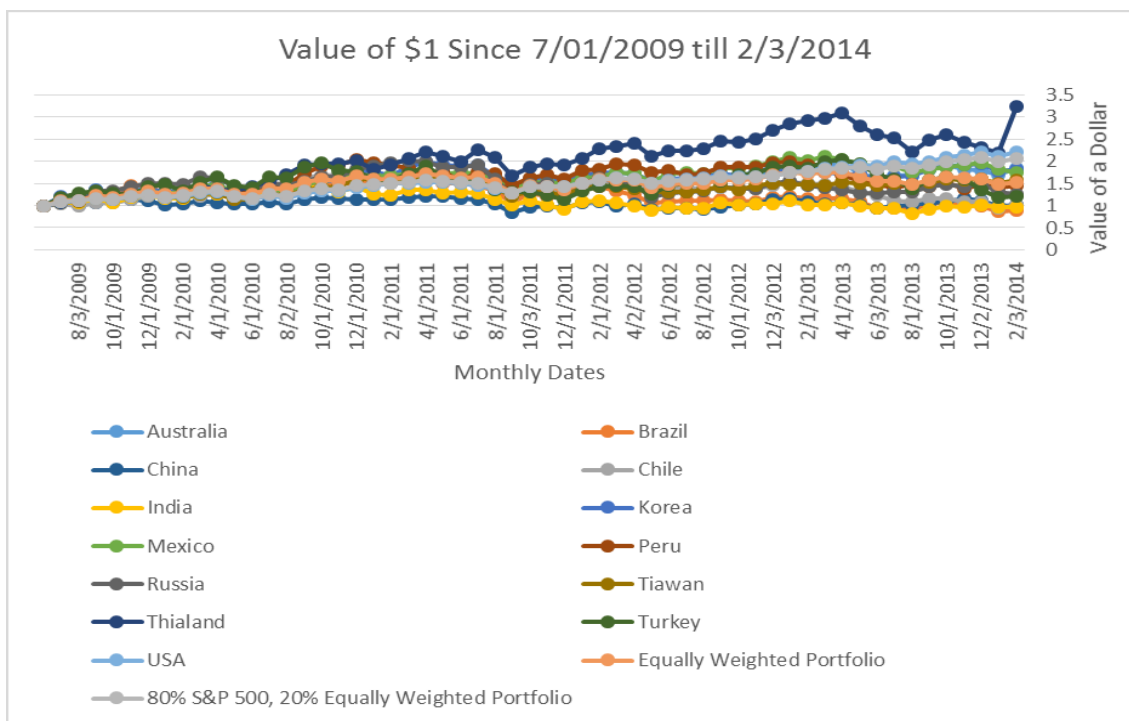
The emerging markets experienced higher average returns than that of the United States market as well as the equally weighted portfolio. Figure 4 demonstrates that the emerging markets produced a higher compound rate of return than the United States market produced since 2000.

Figure 4: Value of \$1 Since 8/1/2000 till 2/3/2014



Since 2000, the emerging markets produced an average 2.35 percent monthly compound return, Australia created an average 2.55 percent monthly compound return, the United States market produced an average .98 percent monthly compound return, the equally weighted portfolio produced an average 2.08 percent monthly compound return, and the 80/20 portfolio generated a 1.06 percent monthly compound return. The high compound return rates associated with the emerging markets is a result of the higher rates of returns attributed to emerging markets during the fourteen year time period. The compound returns differ slightly for all the emerging markets, developed markets, and the equally weighted portfolio when examining the compound rates since 2008. Figure 5 displays the compound value of a dollar since 2008.

Figure 5: Value of \$1 Since 7/01/2009 till 2/3/2014





Since 2008, the emerging markets experienced an average 1.45 percent monthly compound rate, Australia exhibited an average 1.55 percent monthly compound rate, the United States produced an average 1.53 percent monthly compound rate, the equally weighted portfolio produced an average 1.48 percent monthly compound rate, and the 80/20 portfolio generated a 1.58 percent monthly compound rate. As the duration of time decrease, the United States experienced a higher average monthly compound rate while the emerging markets' average compound rate declined. The equally weighted portfolio's average compound rate of return decreased as the duration of time decreased similar to that of the emerging markets. The emerging markets experienced a higher compound rate of return in 2000 while the United States' compound rate of return had a higher increase since 2008.

### **Excess Returns**

The average returns of the emerging markets, developed markets, and the equally weighted portfolio are important, however, rational investors do not base their portfolio selections solely on average returns. Instead, rational investors use the average returns and the average risk-free rates to calculate the excess returns, which is then used to measure the risk-to-return characteristics of each portfolio. Table 4 and 5 displays the average returns, average risk free rates, excess returns, the standard deviation of excess returns, and the Sharpe ratios for each emerging market, developed market, and the equally weighted portfolio.

Figure 4: Annual Excess Return, Standard Deviation, and Sharpe Ratio

Country	Data Period	Average T-Bill	Average Return	Excess Return	Annual STD	Sharpe Ratio
Australia	1996-2013	2.46%	8.14%	5.68%	0.27	0.21
Brazil	2001-2013	1.65%	19.86%	18.21%	0.55	0.33
China	2005-2013	1.57%	15.01%	13.45%	0.38	0.35
Chile	2008-2013	0.31%	7.94%	7.63%	0.48	0.16
India	2009-2013	0.10%	13.29%	13.20%	0.42	0.32
Korea	2001-2013	1.65%	18.96%	17.31%	0.32	0.54
Mexico	1997-2013	2.46%	16.46%	14.00%	0.35	0.40
Peru	2010-2013	0.09%	5.78%	5.70%	0.38	0.15
Philippines	2011-2013	0.07%	10.86%	10.80%	0.31	0.35
Russia	2008-2013	0.31%	10.81%	10.50%	0.72	0.15
Taiwan	2001-2013	1.65%	6.55%	4.90%	0.30	0.16
Thailand	2009-2013	0.10%	28.83%	28.73%	0.40	0.72
Turkey	2009-2013	0.10%	23.48%	23.38%	0.58	0.40
U.S.A	1993-2013	2.83%	10.88%	8.04%	0.19	0.42
Equally Weighted Portfolio	1993-2013	2.83%	14.32%	11.49%	0.28	0.41
80% S&P 500, 20% Equally Weighted Portfolio	1993-2013	2.83%	11.57%	8.73%	0.20	0.45

Figure 5: Monthly Excess Return, Standard Deviation, and Sharpe Ratio

Country	Date Period	Average T-Bill	Average Return	Excess Return	Monthly STD	Sharpe Ratio
Australia	1996-2013	0.21%	0.94%	0.74%	0.07	0.11
Brazil	2000-2013	0.15%	1.22%	1.09%	0.10	0.10
China	2004-2013	0.13%	1.15%	1.02%	0.08	0.12
Chile	2007-2013	0.03%	0.20%	0.17%	0.07	0.02
India	2008-2013	0.02%	0.02%	0.00%	0.10	0.00
Korea	2000-2013	0.15%	1.18%	1.03%	0.09	0.11
Mexico	1996-2013	0.21%	1.30%	1.09%	0.08	0.13
Peru	2008-2013	0.01%	0.93%	0.92%	0.07	0.13
Philippines	2010-2013	0.01%	1.08%	1.07%	0.07	0.16
Russia	2007-2013	0.05%	0.21%	0.17%	0.12	0.01
Taiwan	2000-2013	0.15%	0.31%	0.16%	0.08	0.02
Thailand	2008-2013	0.02%	1.10%	1.09%	0.09	0.12
Turkey	2008-2013	0.02%	0.45%	0.44%	0.11	0.04
U.S.A	1993-2013	0.23%	0.82%	0.59%	0.04	0.14
Equally Weighted Portfolio	1993-2013	0.23%	1.05%	0.81%	0.06	0.13
80% S&P 500, 20% Equally Weighted Portfolio	1993-2013	0.23%	0.86%	0.63%	4.52%	0.14

The excess returns for the emerging markets were typically higher than the excess return produced by the United States market. Nine emerging markets produced an excess return

greater than 8.04%, the U.S. excess return. In addition, Thailand and Turkey were able to produce excess returns of 28.73% and 23.38%, respectively. Furthermore, the equally weighted portfolio also produced an excess return greater than the excess return of the United States market. The equally weighted portfolio resulted in an excess return of 11.49% while the 80/20 portfolio resulted in an excess return of 8.73%. The majority of the emerging markets, the equally weighted portfolio, and the 80/20 portfolio generated excess returns greater than 8.04%. The high excess returns associated with the emerging markets are required by the international investor in order to incentivize them to invest their assets in riskier assets. The excess returns are important to investors' portfolio allocation decision, however, they are not the only components investors use to analyze investment opportunities. More importantly, excess returns are used to calculate return-to-volatility ratios.

### **Standard Deviations**

Table 4 presents the annual standard deviations of excess returns and highlights the high volatilities that associated with emerging markets. Correspondingly to the performance of the average returns, the annual standard deviation is higher for every emerging market in the sample data set than the standard deviation for both the developed markets. The United States has a standard deviation of .18 while the emerging markets had an average standard deviation of .49. A higher standard deviation signifies the more volatile a market is and how much the excess return deviates from the mean. The standard deviation for the equally weighted portfolio is .28, which is higher than either the developed markets but lower than every emerging market in the sample set. This signifies that the equally weighted portfolio has less risk than that of the emerging markets but more risk than the developed markets. In addition, the 80/20 portfolio generated a standard deviation of .20. The 80/20 portfolio and

the United States portfolio only had a .01 difference in standard deviation of excess returns. This signals that the 80/20 portfolio was only marginally riskier than the United States. This study's analysis states that emerging markets have high returns and high volatilities. The high returns are expected since rational investors require additional compensation for additional risks taken on by emerging market stocks. This study's findings regarding the average returns and standard deviations of emerging markets are congruent with the general school of thought that emerging markets have high returns and high volatility characteristics.

### **Sharpe Ratio**

The Sharpe ratio is a method of testing the potential diversification gains of different portfolio combinations. The last column of Table 4 and Table 5 presents the Sharpe ratios for each emerging market, developed market, and the equally weighted portfolio. The highest Sharpe ratios were produced by Thailand and South Korea with the ratios of .74 and .54, respectively. Yet, the emerging markets had an average Sharpe ratio of .33 and 76.9% of the emerging markets had a lower reward-to-risk ratio than that of the United States. The United States market provided a Sharpe ratio of .42 and produced the fourth highest Sharpe ratio out of the emerging markets and equally weighted portfolio. The equally weighted portfolio produced a Sharpe ratio of .41 and had a higher ratio than twelve other financial markets, which included ten emerging markets and Australia. The equally weighted portfolio and the United States market produced similar Sharpe ratios of .41 and .42, respectively. The 80/20 portfolio produced an annual Sharpe ratio of .45 and outperformed the United States and the equally weighted portfolio. The difference between the Sharpe ratios of the United States, the equally weighted portfolio, and the 80/20 portfolio was .03. The United States market in terms of excess returns associated with a given level of risk out performs 76.9% of the

emerging markets, Australia, and the equally weighted portfolio. The emerging markets underperformed the United States and the equally weighted portfolio in terms of risk-adjusted performance.

Thailand produced the highest Sharpe ratio, .72, out of any of the markets and the equally weighted portfolio. However, a root cause of this high reward-to-volatility ratio can be attributed to the lack of historical return information provided by the Thailand index. The Sharpe ratio only took into consideration three years of return data and three years of standard deviations, therefore, limiting the number of periods taken into consideration in the ratio. Due to the lack of observation periods, Thailand's Sharpe ratio is a possible outlier and causes investors to doubt its numerical credibility.

Due to the lack of credibility of Thailand's Sharpe ratio, the United States market becomes the second highest reward-to-volatility ratio, with a Sharpe ratio of .42. The United States market generated a higher Sharpe ratio than that of the equally weighted portfolio, which signifies the decrease of diversification benefits provided by emerging markets. The inclusion of emerging markets into a U.S. portfolio does not lower risk significantly enough to outperform that of a well-diversified domestic portfolio. The wholly domestic portfolio, the U.S. market, generates higher excess returns for higher levels of risk. The equally weighted portfolio does not offer sufficient excess returns to compensate U.S. investors for the additional risk taken on by such risky assets.

### **Correlation**

The correlation coefficient measures the degree to which world financial markets move in conjunction to each other. The correlation coefficient between the sample emerging markets and the United States market is revealed in Figures 6.

Figure 6 Correlation Matrix Since 2000

	<i>USA</i>	<i>Australia</i>	<i>Brazil</i>	<i>Korea</i>	<i>Mexico</i>	<i>Taiwan</i>
USA	1					
Australia	0.78	1				
Brazil	0.70	0.76	1			
Korea	0.75	0.77	0.68	1		
Mexico	0.80	0.76	0.70	0.75	1	
Taiwan	0.67	0.68	0.66	0.79	0.68	1
Equally Weighted Portfolio	0.84	0.88	0.87	0.88	0.87	0.84

Figure 6 depicts the correlation factors between the emerging markets, and the United States market since 2000. Since 2000, the relationship between the United States financial market and that of the emerging market has been higher than .67. Additionally, the highest correlation between an emerging market and the United States is between the U.S. and Mexico. The correlation between Mexico and the United States is .80. The relationship between the two developed markets, the United States and Australia, is .78, which gives it the second highest correlation coefficient. Figure 7 highlights the correlation coefficients between the United States financial market and each sample emerging market since 2009.

Figure 7: Correlation Matrix Since 2009

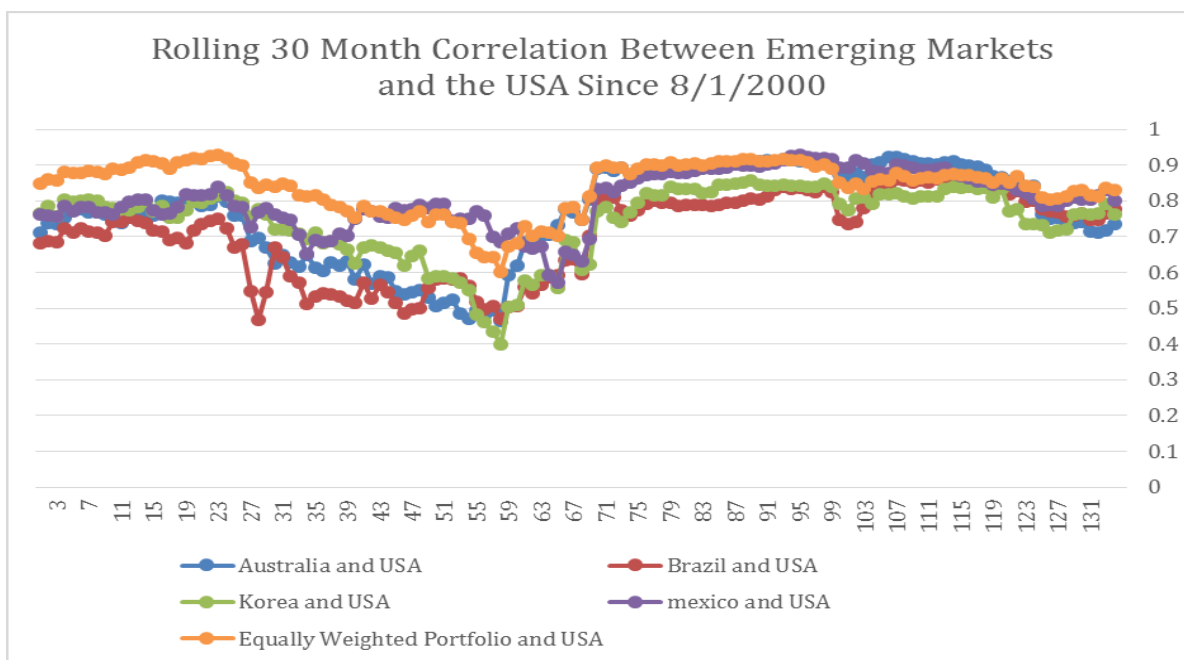
	<i>USA</i>	<i>Brazil</i>	<i>China</i>	<i>Chile</i>	<i>India</i>	<i>Korea</i>	<i>Mexico</i>	<i>Peru</i>	<i>Russia</i>	<i>Taiwan</i>	<i>Thailand</i>	<i>Turkey</i>	<i>AUS</i>
USA	1												
Brazil	0.77	1											
China	0.64	0.81	1										
Chile	0.54	0.76	0.64	1									
India	0.63	0.75	0.62	0.62	1								
Korea	0.75	0.80	0.74	0.63	0.69	1							
Mexico	0.81	0.77	0.73	0.65	0.71	0.73	1						
Peru	0.49	0.61	0.53	0.53	0.52	0.58	0.60	1					
Russia	0.75	0.84	0.76	0.67	0.69	0.82	0.80	0.63	1				
Taiwan	0.77	0.79	0.64	0.64	0.72	0.89	0.68	0.58	0.76	1			
Thailand	0.56	0.75	0.61	0.68	0.71	0.67	0.67	0.60	0.67	0.65	1		
Turkey	0.54	0.58	0.46	0.52	0.61	0.62	0.59	0.27	0.54	0.57	0.60	1	
Australia	0.81	0.89	0.74	0.69	0.68	0.81	0.79	0.59	0.81	0.76	0.73	0.61	1

The correlation coefficients were calculated in order to view the movement of correlation in recent years. The correlation between the United States and each emerging market has increased since 2000. The correlation coefficient has increased between the United States and Mexico by .01 resulting in a correlation of .81 since 2009.

Figure 8 depicts the rolling correlation factors between the United States and a few emerging markets since 2000. Figure 8 indicates the co-movement of the emerging and developed markets. The developed and emerging markets have experienced similar patterns in correlation, which signals a high level of co-movement between financial markets. The U.S. and emerging markets have a degree of correlation relation and have witnessed an increase in correlation as time has increased.



Figure 8: Rolling 30 Month Correlation between Emerging Markets and USA since 8/1/2000



### DISCUSSION

Historically, the majority of analysts and scholars support the notion that emerging markets are able to generate diversification benefits to the United States investors due to their high returns and low correlations between the emerging markets and the United States. However, this view has been the subject of much debate and a source of controversy in recent years. Some analysts and scholars believe that the increase of trade liberations in emerging markets and the increase of globalization of world markets decreases the amount of independence between world markets and emerging markets, thus increasing the correlations between markets. Through the analysis of historical risk-to-return variables of a sample of emerging markets, the United States, an equally weighted portfolio, and a portfolio consisting of 80% S&P 500 securities and 20% emerging market securities, this study aimed to discover whether U.S. investors received a diversification benefit from incorporating emerging market securities into their domestic portfolios and whether the correlations

between emerging and developed markets were low and maintained that relationship over time.

The emerging markets that composed the sample set exhibited high returns and high volatilities which is in accordance with the general characteristics of emerging markets. However, the analysis of the risk-to-volatility ratios, Sharpe ratios, of the United States, Australia, each emerging market, and two artificially created portfolio resulted in the United States producing the third highest a Sharpe ratio of .42, while South Korea produced a Sharpe ratio of .52 and the 80/20 portfolio produced a ratio of .45. Meanwhile, the equally weighted portfolio produced a ratio of .41. The Sharpe ratio tests the diversification ability of different portfolios. The Sharpe ratio was used to determine whether to accept or reject hypothesis 1 and hypothesis 2.

The first hypothesis, Hypothesis 1, predicated that United States investors did not receive a diversification benefit from maintaining an equally weighted international portfolio composed of both domestic and emerging market securities. The Sharpe ratios of the United States market and the equally weighted portfolio provided the foundation as to accept or reject this hypothesis. The United States market produced a Sharpe ratio of .42 while the equally weighted portfolio resulted in a Sharpe ratio of .41. The higher Sharpe ratio for the United States market signifies that a well-diversified domestic portfolio consisting solely of U.S. securities offers a higher amount of excess return for additional risk than the equally weighted portfolio that incorporates U.S. securities, Australian securities, and thirteen emerging market securities. Therefore, the first hypothesis is accepted and supports the theory that a well-diversified U.S. portfolio outperforms an equally weighted portfolio that incorporates emerging market securities. The incorporation of emerging markets into a

portfolio did not offer sufficient return for the additional risks that are associated with emerging markets.

Although the Sharpe ratios for both the U.S. market and the equally weighted portfolio did not differ significantly, rational U.S. investors require higher returns for the equally weighted portfolio in order to incentivize them to undertake more risks that accompany emerging markets, such as political instability risks, different accounting standards, liquidity risks, currency risks, etc. The U.S. investor requires higher returns for the equally weighted portfolio than the domestic portfolio because the U.S. investor is able to invest and participate in a domestic market that is both efficient and secure while emerging markets present more investment barriers. In order to entice investors to allocate assets in emerging markets, the emerging markets would need to produce a higher Sharpe ratio, higher ratio of excess returns for the additional risks assumed.

The United States portfolio outperformed the equally weighted portfolio in terms of the Sharpe ratio; however, the 80/20 portfolio generated a higher Sharpe ratio than the purely domestic portfolio. The difference between the Sharpe ratios of the United States, the equally weighted portfolio, and the 80/20 portfolio was .03. This suggests that there is not a significant difference between the Sharpe ratios of the three different types of portfolios. However, it is important to note that the inclusion of emerging markets in a portfolio that were assigned different weights were able to create the highest Sharpe ratio, thus providing a small degree of diversification benefit over the time period of 1993-2014. The inclusions of emerging markets into a portfolio can provide slight diversification benefits, however the degree of diversification benefits depends on the different weights assigned to each market. In this study, the 80/20 portfolio outperformed the equally weighted portfolio thus suggesting

that individual investors need to determine the optimal portfolio structure in order to maximize their diversification gains. U.S. investors need to determine whether or not the marginal diversification gain of .02 is worth the time that is needed to determine the optimal portfolio structure and weights. The emerging markets do provide slight diversification benefits to U.S. investors, however an equally weighted portfolio does not provide enough diversification gains to outperform the U.S. market.

The Sharpe ratios also determined whether or not the second hypothesis, Hypothesis 2, is accepted or rejected. Hypothesis 2 states that a United States investors receives a diversification benefit from investing in a well-diversified domestic portfolio. The second hypothesis is accepted since only two emerging markets' Sharpe ratios outperformed the U.S. markets. Both South Korea and Thailand produced higher Sharpe ratios than the United States market, however, the data period for Thailand only went back till 2011. The lack of historical information available for Thailand causes Thailand's return-to-volatility measure to have credibility issues and its reliability questioned. Therefore, Thailand's Sharpe ratio is classified as an outlier and disregarded from the analysis. Consequently, South Korea was the only emerging market that provided a higher Sharpe ratio than the United States market provided. Due to the overall underperformance of the emerging markets and the equally weighted portfolio, the United States is the portfolio composition that offers the greatest diversification benefit for a United States investor. The reason why the U.S. market might offer one of the highest reductions of risk might be associated with the relatively stable nature of the U.S. financial market, the liquidity of the market, the fact that each investor is assumed to have the same information, and the diverse classification of stocks available to the average investor. The United States investor receives more diversification benefits from a

well-diversified domestic portfolio than solely emerging market portfolios or from an equally weighted portfolio consisting of both emerging market and developed market securities.

The emerging markets ability to produce diversification effects does not solely depend upon their returns and volatilities but also by the degree of correlation between the emerging markets and the developed markets. Hypothesis 3 tests the theory that correlations between emerging financial markets and developed financial markets have risen in the past fourteen years. The correlations between the United States market and each of the emerging markets was calculated since 2000 and 2009 in order measure the movement in correlations between the emerging markets and the U.S. Figure 6 highlights the correlation between the United States and the emerging markets since 2000 while Figure 7 depicts the correlation between the U.S. and all the emerging markets since 2009. The comparison of the correlations of the emerging markets since 2000 and 2009 supports hypothesis 3. In 2000, Brazil had a correlation coefficient of .70 and a correlation of .77 in 2009. Since 2000, all four of the emerging markets witnessed an increase their correlation coefficients in 2009. In addition, Figure 8 show the rolling 30 month correlation trend between the emerging markets and the United States. Figure 8 highlights the similar movement between the emerging markets and the United States since 8/1/2000. The general movement of each five markets and the United States follow a similar trend. This trend is significant since it signals that the financial markets are becoming increasingly integrated and correlated. The phenomenon could be explained by thought that the world financial markets are witnessing more emerging market move towards trade liberalization and the increasing integration of the developed markets into emerging markets (Haque & Kaoui, 2010). The correlations between emerging markets and developed markets have historically been low and believed to be a main factor

in providing diversification benefits to United States investors, however, this study's findings support the new school of thought regarding the decrease in the emerging markets' ability to produce diversification benefits due to the increasing correlation and integration of world financial markets.

### **Limitations**

The information available for the emerging markets are limited and occasionally reported in different currencies. The lack of historical information for the emerging markets served as a limitation in this study since every emerging market and developed market had varying observation periods. The majority of the emerging markets only provided historical returns since 2008. Another limitation was that a majority of the emerging markets reported their historical prices in different currencies, thus, narrowing the types and number of indices that were useable in the sample set. The two limitations hindered the study's ability to select diverse emerging market indices, to produced calculations for similar time periods, and hindered the ability to compare all the emerging markets for the same time periods. In order to solve the comparison issue, the study had to create two different timetables when comparing correlation and monthly average compound rates.

### **CONCLUSIONS AND IMPLICATIONS**

Emerging markets are characterized by high returns, high volatiles, and low correlations to developed markets. It is through these characteristics that enable emerging markets to produce diversification benefits to investors in developed markets. Congruent to the popular school of thought, the emerging markets in this study produced higher returns and higher volatiles when compared to that of the United States. However, contrary to earlier

works, the emerging markets and the United States had relatively high correlation coefficients since 2000 and has increased since then. The increase in correlation between the emerging markets and the United States indicates a reduction in their ability to diversify portfolio risk. This reduction is evident in the Sharpe ratios that were produced by the emerging markets and the equally weighted portfolio. Both the emerging markets and the equally weighted portfolios produced lower Sharpe ratios than the United States market. The United States market was able to outperform both the emerging markets and an equally weighted portfolio.

The emerging markets continue to be an important asset class regardless of their performance in the equally weighted portfolio. However, U.S. investors generate higher diversification benefits from a well-diversified domestic portfolio rather than an equally weighted portfolio. U.S. investors did receive diversification gains from participating in a stable and liquid market while the inclusion of emerging markets in an equally weighted domestic portfolio did not outperform a well-diversified U.S. portfolio. Yet, U.S. investors did receive a slight diversification gain from maintaining a portfolio consisting of 80% of the equally weighted portfolio and 20% emerging market securities. The slight diversification gain of the 80/20 portfolio signifies that emerging markets can provide a slight diversification gain; however, the degree of diversification benefits the investor receives depends on the different weights he or she assigns to the developed and emerging market securities. Additionally, U.S. investors need to be aware that the emerging markets also have more associated risks and investment barriers than the U.S. market. Direct investments into the emerging markets are not the only way investors can partake in the asset class. According to Barry et al. (1997), investors may seek to invest in professionally managed funds, such as ETFs, in order to

reduce information barriers, language differences, and accounting differences. International investors may invest in professionally managed funds in order to gain exposure to this growing asset class while minimizing potential exposure to risks. In addition, U.S. investors could invest in domestic companies whom have a presence in foreign countries. This would allow U.S. investors to invest in stable companies whom are directly influenced by economic conditions of emerging markets. Domestic investors are not restricted to direct foreign investment in emerging market securities. Instead, domestic investors can seek indirect investing options in order to help alleviate risks and allow the opportunity to invest in companies that have international presence while reducing risks.

The subject of emerging markets and their ability to provide diversification benefits will continue to be important issue to United States investors. United States investors will continue to search for different techniques to help generate additional returns and reduce risks in their portfolios. The importance of finding different ways to diversify portfolios grows as globalization and market integration increases. However, this paper suggests that the developed market investor does not gain significant additional value by including emerging markets into their portfolios. Instead, this paper recommends that a U.S. investor focus on diversifying his or her own portfolio through the selection of domestic securities that participate in different industries, as well as, companies who have a presence in foreign countries. This recommendation aligns with the major finding that United States investors receive more diversification gains by developing and maintaining a well-diversified domestic portfolio instead of incorporating emerging market securities in their portfolios directly.



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