

# **THE MAIN ADVANTAGES OF INTERNATIONAL PORTFOLIO DIVERSIFICATION**

DAVID MADIGAN

*Senior Sophister*

*The increasingly integrated global financial system has recently been under attack on all sides. This paper by David Madigan emphasizes the benefits of holding an internationally diversified portfolio of assets, and seeks to explain why investors fail to take full advantage of this risk-reducing strategy. He presents evidence suggesting that the phenomenon of 'home bias' has decreased within the Eurozone thanks to the removal of exchange rate risk from the equation. However, he cautions that in times of crisis the correlation coefficient between international financial markets actually tends to increase.*

## **Introduction**

In 1974, Bruno Solnik wrote a famous paper that highlighted the merits of international portfolio diversification. Since then, numerous academic papers have been written on the subject outlining the many benefits. One common theme, repeated throughout this body of work, is that by diversifying internationally the overall risk of a portfolio is reduced. This is due to different underlying industrial structures and unsynchronised business cycles between countries across the globe. The first part of this paper highlights the main advantages for international portfolio diversification. The following section of the paper attempts to explain why equity portfolios of investors are typically concentrated in domestic stocks. Finally the recent trend of convergence in worldwide stock market correlations is examined, with a particular focus on the reasons behind increased correlation coefficients during times of financial distress.

## The Advantages

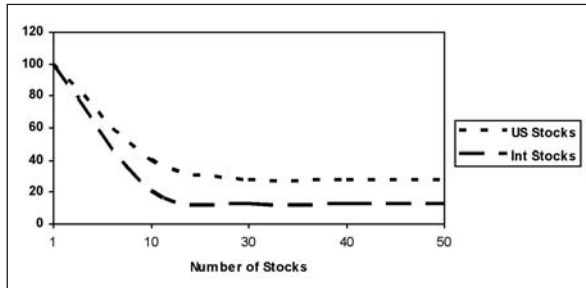
By holding a diversified portfolio an investor reduces risk. The correlation between the returns of the securities that make up a portfolio is critical in determining the associated risk. The total risk of any portfolio is composed of both systematic and unsystematic risk. Traditionally, idiosyncratic, firm-specific (unsystematic) risk can be reduced by holding a diversified portfolio of assets, while market (systematic) risk cannot be diversified away. However, by diversifying internationally, the portfolio's 'beta' (the overall level of systematic risk) is also lowered by exploiting the low correlations of stock market returns across countries. This is due to the fact that the returns on different stock markets are not perfectly positively correlated. The correlation between domestic and foreign securities is lower than purely domestic securities: 'this is due to the monetary, fiscal and industry policies varying from country to country' (Lagoarde-Segot and Lucey, 2007: 2). We expect smaller return correlations between international investments: 'because there are different industrial structures in different countries and because different economies do not follow the same business cycle' (Eiteman et al, 2000: 307). For example, in terms of market capitalization, Ireland's stock market is dominated by financial firms such as AIB and Bank of Ireland. In contrast: 'the German equity market is heavily weighted by cyclical industries, such as automobiles and industry goods, whereas in Switzerland the pharmaceutical companies...have an above average weight' (Freimann, 1998: 33).

Industry betas are different across the board, with the utility sector for the most part having a smaller reaction to market movements, while the computer software industry generally has a larger reaction to market volatility. The recent financial crisis in the UK and the USA has resulted in the Irish stock market suffering on a greater scale in comparison to its EU counterparts. This is due to the domination of the financial firms in the Irish stock market. As such, it is important that investors note the industry structure of countries in their portfolio as two countries will be more highly correlated if their industrial make-up is similar. Some international indices are so industry concentrated that investors are effectively taking a stake in an industry. Return volatility is also related across countries: 'inversely to the number of stocks in the index and positively to the 'Herfindahl' measure of 3 digit concentration within an index' (Roll, 1992: 38). Essentially a country's index is more volatile when it is less well diversified.

Figure 1 shows the reduction in total risk achieved by selecting an equal number of stocks across countries. The benefits of international diversification are clearly substantial. For example, domestic diversification in the United States has systematic risk of 27% while the total risk of a globally diversified portfolio

converges to 11.7% (Solnik, 1974).

**Figure 1. International Diversification<sup>1</sup>**



It is also evident from the graph that the majority of the benefits (in the form of reduced risk) derived from diversification can be achieved by holding a portfolio of around twenty stocks. Nonetheless, a twenty stock portfolio still has an appreciable level of risk, and moreover the number of stocks to achieve a given level of diversification has increased in recent years (Dimson et al, 2000). It should also be noted that companies can diversify through merging with or acquiring foreign companies. AIB is an excellent example of this, as they have investments in the US, the UK and in mainland Europe. This diversification strategy is beneficial as it may reduce the volatility of profit returns. However if investors can diversify more easily than firms then the benefits of firm diversification are not passed on to investors as they would already have an optimally diversified portfolio.

When comparing the real equity returns across countries in the 20<sup>th</sup> century, the US fairs particularly well with a real return of 4.32% (Jorion and Goetzman, 1999). It seems that there is no coincidence between this high equity return and the fact that the U.S.A avoided war (on home soil), hyperinflation and political upheaval during this period. This argument is further supported by the fact that Sweden, the second best performing country, also avoided major upheavals: 'This strongly suggests that estimates of equity premiums obtained solely from the U.S market are biased upwards by survivorship' (Jorion and Goetzman, 1999: 955). The cases of Japan and Germany illustrate this point as their returns are distorted by huge losses due to the Second World War. Between 1945 and 1948 Germany equities tumbled by 91%, while Japanese equities lost a whopping 97% in value from 1944 to 1947 (Dimson et al, 2000). However

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<sup>1</sup> Source: Solnik (1974)

when comparing the volatility of US returns with the rest of the world between 1920-2000, the volatility of the: 'non-U.S. index is about 10% which is much lower than that of the U.S. market alone, reflecting the fact that the portfolio is spread over a greater number of markets, thus benefiting from imperfect correlations across markets' (Jorion and Goetzman, 2001: 977). This result reflects the benefits of international diversification, which spreads the risk of dramatic events over a large portfolio.

Correlations of equity returns between countries depend on the underlying structural relationship between countries such as colonial past, currency regimes, trade flows, economic growth and industrial make-up. The correlation coefficients of real equity returns among countries worldwide are quite modest, except between countries that are closely linked such as Canada and the United States. In an international study of stock market correlations only 50 out of 276 correlations were above 0.5 and these were mainly between countries that are inextricably linked (Roll, 1992).

Presently, the United States represents about 46% of the value of world stock market in terms of market capitalisation, so one would expect US investors to hold 54% of their portfolio in foreign securities to fully capture the benefits of diversification. However, by the end of 2003: 'US investors held only 14% of their equity portfolio in foreign stocks' (Campbell and Kraussl, 2007: 1239-1240). This is despite recommendations that: 'a US investor, maximising a mean-variance portfolio strategy should hold at least 40% in foreign stocks' (Lewis, 1999 quoted in Campbell and Kraussl, 2007: 1240). Nevertheless there is a steady trend towards greater diversification, with US investors increasing the international weighting in their portfolios from 1% in 1980 to the current weighting of 14% (Dimson et al, 2000). So why do US investors currently hold the vast majority of their portfolios in domestic securities? This phenomenon has been labelled 'home bias' in the financial literature.

## **Home Bias**

Home bias measures the degree to which investors of a given country are: 'overweight in domestic assets and underweight in international assets, as compared to the benchmark portfolio that would weigh home and foreign countries assets according to respective shares in the global financial market' (Fidora et al 2007: 635). Many studies have been undertaken to explain the strong preference of investors towards domestic assets. Exchange rate volatility is a major deterrent for investors as the equity returns can be altered significantly if the exchange rate moves dramatically. For example, the US dollar has

experienced a steady depreciation against the euro over the six month period straddling the last three months of 2007 and the first three months of 2008, with the euro/dollar rate set to hit the unprecedented \$1.50 mark in the next few months. Therefore over this time period European investors with large weightings in US equities would have experienced lower real gains than a US domestic investor who had invested in exactly the same stocks. On the other side of the equation, a US investor with a large weighting in European equities would have gained from the favourable swing in the exchange rate. A recent study on this subject states that: ‘real exchange rate volatility can explain about 20% of the cross-country variation in equity and bond biases’ (Fidora et al, 2007: 633). Derivative instruments such as options and futures can be used to successfully hedge against exchange rate volatility although there is a cost associated with hedging.

Capital controls and the degree of corporate governance have also been highlighted as possible reasons for home bias. An extreme example of capital controls is that a US investor may not have been able to invest in Japan and Germany during the Second World War (Jorion and Goetzman, 1999). Information and transaction costs are also examples of barriers to foreign investment; however, the internet has dramatically reduced the information deficit and consequently reduced information and search costs. Patriotism must also be accounted for when examining investor preferences as investors may feel it is their ‘duty’ to invest in domestic companies. Remarkably, patriotism is also highlighted as a factor in foreign investment, particularly amongst US investors who exhibit what is known as ‘mother country bias’ towards countries such as Mexico and Ireland due to the strong ancestral links the US has to these countries (Dimson et al, 2000). On the other hand, smaller international markets may be perceived as less attractive investments due to their tendency to be: ‘less liquid, more prone to price volatility, susceptible to physiological influences and probably less efficient’ (Roll, 1988: 33). Clearly there are a diverse range of factors influencing any investment decision.

### **The European Monetary Union (EMU)**

The EMU provides an excellent case study on the reasons for home bias as many factors highlighted in the previous section are eliminated. The introduction of the euro has meant that currency risk disappears completely among participating countries. As a result, the barriers to cross-border investment arising from the cost of hedging are eliminated. Secondly, the common monetary policy has resulted in the convergence of long-term interest rates which has brought about

almost perfectly correlated real risk free rates.

**Figure 2. Bond and Equity Bias in the Euro Area<sup>2</sup>**

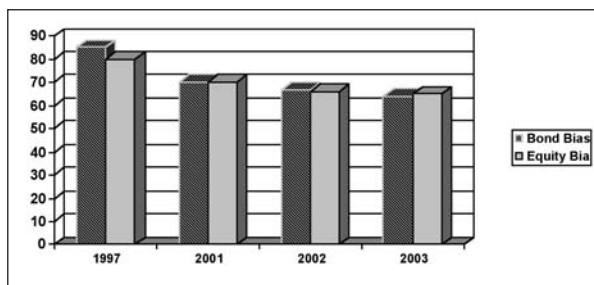


Figure 2 shows how bond and equity bias in the Euro area amongst EMU countries has steadily dropped since the introduction of the single currency. Between 1997 and 2003 equity bias has dropped from 80% to 64% which demonstrates that the reduction in exchange rate volatility has induced EMU investors to increase their holdings of other countries in the monetary union (Fidora et al 2007).

However, the monetary integration has also led to greater trade integration. Due to the increased interconnectedness of the EMU countries, there is now greater business cycle synchronisation. These factors, coupled with the disappearance of currency risk have resulted in stock market correlations increasing for most countries in the EMU as shown in Figure 3.

**Figure 3. Return Correlations to an EMU return<sup>3</sup>**

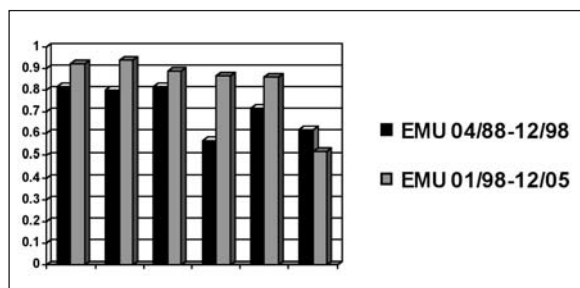


Figure 3 demonstrates that: ‘for most countries, correlation coefficients between

<sup>2</sup> Source: Fidora et al. (2007)

<sup>3</sup> Source: Lane and Walti (2006)

the returns of individual EMU participants and the EMU have increased after the introduction of the euro' (Lane and Walti, 2006: 9). The reason for Ireland's low correlation is that it is strongly linked to US performance and to a lesser extent the UK. The resulting higher correlations in the EMU means that is more difficult for a European investor to diversify away risk in the region by holding stocks from other EMU nations.

## **The Convergence of Worldwide Stock Correlations**

Over the past twenty years, the importance of the domestic stock market in many industrialised countries has risen sharply, while at the same time the degree of co-movement amongst international equity markets appears to have increased. Increased financial integration and globalisation are core reasons why correlations between countries have risen. Correlations between Germany, the United States and the United Kingdom have more than doubled from 0.3 to 0.65, whereas correlations between Japan and the same three countries have remained roughly constant at 0.3 (Berber and Jansen, 2005). This trend in correlations has resulted in the weight of the Japanese equities in the optimal world portfolio increasing over time.

However, the general increase in correlations has a downside for investors as: 'national economies are more frequently affected by the disturbances originating in foreign stock markets' (Berber and Jansen, 2005: 833). International stock markets are more highly correlated in periods of high volatility, particularly when it is downward volatility. The correlations between countries may also be higher: 'in some periods of the business cycle, for example periods characterised by high levels of interest rates and dividend yields' (Longin and Solnik, 1995). It has already been highlighted in this paper that the benefits of international portfolio diversification result from the relatively low correlation between country returns so therefore it would be particularly useful to achieve a lower total risk in times of financial market crises. Unfortunately, the empirical evidence suggests that correlation coefficients across countries actually rise during periods of financial distress. Consequently, the benefits from international diversification are reduced just when they are needed most. The Eastern Asia crises of 1997 will now be examined to demonstrate this point.

## **The Asian Financial Crisis of 1997**

Prior to 1997, East Asia had the enviable economic conditions of soaring growth,

low inflation and high saving, with countries such as Thailand, Indonesia, Singapore and South Korea experiencing high growth rates. As a result, the currency crisis that hit East Asia in 1997 was largely unpredicted. The currency crisis started with a devaluation of the Thai Baht on 2<sup>nd</sup> July 1997 due to massive speculative attacks against it in mid-May 1997. The Baht dropped swiftly, losing half its value relative to the US dollar almost immediately. Due to contagion effects or otherwise, other East Asian countries followed the Thai Baht's plunge and the crisis spread in the form of a string of devaluations and stock market collapses as other East Asian currencies came under speculative attacks. Before the crisis there was almost no co-movement in the stock markets of seven Asian countries: South Korea, Japan, Thailand, Singapore, Indonesia, Hong Kong and Taiwan. However: 'unidirectional and bidirectional linkage among Asian equity markets has increased sharply since the financial stock crisis struck Asia in June 1997' (Jang and Sul, 2002: 103). Most notable is the drastic changes in the co-movement among the four Southeast Asian countries of Hong Kong, Thailand, Indonesia and Singapore. In the pre-crisis period between the 1<sup>st</sup> of October 1996 and the 31<sup>st</sup> of May 1997, the correlations of equity returns between Hong Kong and Singapore and between Thailand and Indonesia were 0.35 and 0.1 respectively (Jang and Sul, 2002). From the 1<sup>st</sup> of June 1997 to the 31<sup>st</sup> of January 1998 these correlations had jumped dramatically to 0.76 and 0.4 (ibid). This illustrates that the merits of diversification may contract under financial duress.

## Conclusion

International portfolio diversification carries significant benefits in terms of lower total risk by taking advantage of imperfect correlation coefficients between countries. This is predominantly due to the fact that stock markets across the world have different industrial structures, which means that their business cycles are also out of synch. An investor from the United States who only diversifies domestically typically holds over two and a half times more risk than an investor who diversifies globally. However, a trend has emerged in the last twenty years whereby global equity correlations have converged. Consequently it is becoming more difficult for investors to diversify risk using this strategy. Nevertheless, equity portfolios of investors are typically concentrated in domestic stocks due to factors such as exchange rate volatility and information asymmetries. The introduction of the euro has demonstrated that the removal of exchange rate volatility reduces home bias in equities and bonds. Finally, the main disadvantage associated with international portfolio diversification is that correlation



coefficients tend to increase when the global financial system is under pressure. This has been highlighted in the case of the East Asian crisis of 1997.

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