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**IRRATIONAL MARKETS, IRRATIONAL
INVESTORS: THE FOREIGN CARD**

by

John A. Sondey and Tony Jacobson

Economics Staff Paper 2003-1

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IRRATIONAL MARKETS, IRRATIONAL INVESTORS: THE FOREIGN CARD

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The full arrival of the information age, transported through the medium of the internet, provides the individual investor with quicker access to more information than ever before. Economic theory tells us that greater transparency in investment decisions should make for more efficient financial markets; i.e. smaller deviations of security prices from their "true" or intrinsic values. However, recent evidence based in US stock market performance suggests that the vastly improved information flow may cause investors to act in a less rational manner, leading to greater market volatility and less efficient financial markets.

The argument that information technology (IT) provides the average investor with greater transparency in decision-making is a compelling one. With greater transparency, more information will be more available to more investors, leading to improved price discovery among professional investors. In turn, non-professional investors will be able to obtain a better price (Pagano and Roell, 1996). In concert, the internet, personal computers, discount brokers, and tighter SEC regulations on equitable disclosure make securities markets more transparent. IT provides free access to all public information and offers investors a larger store of information than was historically provided via the print media. Pagano and Roell (1996) also propose that expected trading costs to investors

decline as a market becomes more transparent, which further levels the playing field for non-professional traders.

However, it is the nexus between more perfect information and investor psychology which may provide at least a partial explanation for recent heightened volatility in the US stock market (Evidence the reduction of the Nasdaq composite index from 5200 in March 2000 to 1300 in July 2002 and the deflation of the DJIA from 10,500 in February 2002 to nearly 7500 in July 2002). The paper will examine the links between more perfect information, investor psychology, and market volatility and, as a bromide, suggest that foreign investment comprise a part of one's portfolio.

Stock Market Efficiency:

Fama (1970) regards an efficient market as one which all prices fully and quickly reflect available information. A market will be efficient when perfect, costless information is available to all investors. Therefore, individual investors act on information much like firms in a perfectly competitive industry. A second condition of efficiency is that investors and, consequently, prices react quickly to new information such as earnings announcements, guidance, and other public information. Odean (1998) specifies the final requirement for efficiency: there must be large number of rational, profit-maximizing investors participating in the market. That is, irrational investors cannot process fresh information into rational investment decisions.

Eugene Fama (1970) developed the Efficient Market Hypothesis (EMH) to explain the process of information generation, assimilation, and pricing in the stock market. The

weak variant of EMH states that security prices fully and quickly reflect historical price and selling volume information. Reilly and Norton (1995) note that this construct of EMH assumes that new data is generated randomly and that today's price movement is independent of yesterday's price change. According to the weak form, it follows that an investor's decision based on past information should not help him realize any capital gains today because of the independence between historical and immediate stock price movement.

The middle (strength) variant of EMH states that security prices will quickly adjust to the release of all public information; which includes all non-market generated information including dividend changes, economic news, and valuation ratios such as the price-to-earnings ratio. The middle variant includes all the criteria for the weak form; i.e. historical price/volume data. Accordingly, all current public information is very quickly built into stock price. Thus, the aspiring investor can only hope to profit from unannounced (future) information.

The strong form of the EMH proposes that security prices fully and quickly reflect all information, public and private (information held by corporate management but not yet released to the public) information. The strong form implies that no single individual or group (corporate insiders) has monopolistic access to information that would allow for capital gains.

As EMH is one of the cornerstones of financial market theory, many researchers have tested the hypothesis, in all its forms, to determine the extent to which EMH describes market behavior. While each variation of EMH has its champions and critics,

the weight of the evidence points to the strong form of EMH as too “muscular” in that there are many documented cases of insiders profiting from privately held information. The middle form of EMH also offers its share of anomalies, among them the January effect and the Monday effect. The January effect notes that investors engage in tax loss selling at the end of the calendar year and then in the first four trading days of January, reinvest the monies. Jones, Lee, and Apenbrink (1991) found that fifty percent of excess returns are generated in the first trading days of a new year. The Monday effect reveals that trading volume is lower on Mondays than on other weekdays and that individual investors trade more as a percent of total trades on Mondays, implying that institutional investors are more likely to spend Mondays on the sidelines (Lakonishok and Maberly, 1991). In a truly efficient market, a/k/a, the EMH, there could be no abnormal returns because all historical information is quickly built into stock prices. However, the January effect, the Monday effect, and other anomalies occur year after year, to an extent that they are predictable.

In sifting the historical evidence, the highest marks for veracity would be awarded to the weak form of EMH, while the middle and strong variants are difficult to accept given the large body of countervailing evidence. However, in light of the advances in information technology and the pipeline of more and better information direct to the individual investor, one might expect that the EMH is more valid today than in previous decades. This has not necessarily been the case.

Investment and the Internet:

The reach and sophistication of the internet have been a major contributor in the increasing percent of US households invested, directly or indirectly in the stock market. Prior to the Crash of 1929, it was estimated that approximately 5% - 10% of American households were invested, through some means, in the stock market. Today, approximately 50% of US households participate directly or indirectly, through mutual funds or pension plans, in the stock market. In 1975, 31 percent of total household assets were held in the form of stocks, bonds, and mutual funds. By 1998, this figure had risen to 61 percent (Barber and Odean, 2001). Although the growth in brokerage accounts has slowed since the market's peak in 2000, the number of on-line accounts continues to grow. Cerulli Associates and Robertson Stephens (2000) reported that investors opened 12.5 million on-line accounts between 1995 and 2000. On-line accounts are projected to exceed 40 million by 2003. In 1998, on-line trading accounted for 37% of total, non-institutional trading. While discount brokers such as Schwab, Ameritrade, and E*Trade pioneered on-line investing, which makes up the majority of their trading volume, traditional brokers such as Merrill Lynch, Edward Jones, and Dean Witter have also found it necessary to offer an on-line product. On-line investment encourages trading through of lower commissions, 24 hour accessibility, ease of use, and because the transition from researching a stock to purchasing it involves only a few key strokes. Barber and Odean (2001) estimate that an individual with internet access has 3 billion pieces of information *freely* available regarding the stock market and corporate financials. Investors who pay to open an on-line account, or for information services such as *Value Line* or *Morningstar.com* are able to access nearly 280 billion pieces of information.

Investor Overconfidence, Irrationality, and the Internet Link:

As investors are fed more information, confidence in the accuracy of individual forecasts is likely to grow faster than the accuracy of those forecasts. Abetted by the internet, information overload is likely to occur – or, as it has been termed, an *illusion of knowledge* (Keller and Staelin, 1987). People tend to weigh information they agree with more *heavily* than information counter to their beliefs. They seek out others who share and reinforce the same viewpoint. Investors are more likely to join chat rooms, seeking out like-minded investors whose moral support makes them yet more confident in their investing acumen. As a result, investors will engage in more active and more speculative trading (Barber and Odean, 2001).

Illusion of control is another term used by psychologists to explain individual behavior. It occurs when people (investors) behave as if their participation can influence the outcome of random events. Overconfidence arises where investors think they can improve performance through knowledge acquisition and active involvement, as they are comfortable with their personal and perceptive decision-making process. The *illusion* arises where investors confuse the control they have with the control they don't have; e.g. investors can control which stocks they place in their portfolio, but not the returns earned on those investments (Barber and Odean, 2001).

Daniel, Hirshliefer, and Subrahmanyam (1998) concur with Barber and Odean while offering the *attribution theory*. This theory argues that investors “too strongly

attribute events that confirm the validity of their actions to high ability and events that disconfirm the action to external noise or sabotage.” If a trader places trades based on his/her own private signal, the trade is “confirmed” if the sign on the share price is the same as the sign on the signal. Therefore a negative private signal triggers a sell which is confirmed by a lower stock price. Confidence is bolstered when a purchase is documented by a rising share price, but a disconfirmed trade (investor buys and price falls afterwards) reduces confidence slightly, if at all.

David Dreman (1998) states that investor overconfidence can be traced to three factors. First; people tend to be unrealistically optimistic regarding future events. Shiller (2000) elaborates on this by offering “hindsight bias” – in that investors regard historical data as information they would have expected, were they living in the past. This bias encourages investors to view future outcomes as relatively predictable. Dreman’s second premise is that people (investors) tend to hold unrealistically positive self-evaluations, which, in turn feeds his third premise, that investors hold a surreal expectation of their own ability to influence a particular outcome. Odean (1998) notes that overconfidence is a characteristic of people, not markets. Psychologists have discovered that people systematically underweight some types of information and overweigh other information. Psychological studies indicate that individuals tend to systematically underweight abstract, statistical, and other, very relevant, information while overweighing more “attractive” information that catches their eye. This may help to explain the voracious public appetite for initial public offerings in the late 1990’s. Overconfidence on the part

of investors tends to generate trading volume and price volatility, as price is driven further from its intrinsic value by buoyant bidders.

If market valuation of stocks is driven excessively above their intrinsic value, “bubbles” form. A bubble is more precisely defined as “a market-determined asset price at odds with any reasonable economic explanation (Garber, 1990).” Bubbles become possible when markets occasionally spawn irrational, inefficient, and “exuberant” pricing (Shiller, 2000). Speculative bubbles date back to “Tulip mania” in Holland of the 1600’s. In the twentieth century speculative bubbles arose: in the US in 1929, where the Dow Jones Industrial Average would plummet from 320 to 40 by 1933; in Japan in the late 1980’s, when the Nikkei 225 index approached 40,000; and in the US in 2000, when the Nasdaq composite would peak at 5200 (vs. 1300 today). Investor overconfidence and hubris helped inflate the aforementioned bubbles and, inevitably, both bubbles and confidence vanished in the predictable denouement.

Hirshliefer (2001) uses the term *illusion of truth* in attempting to explain investor psychology. Hirshliefer proposes that investors are “more inclined to accept the truth of a statement that is easy to process.” He finds that familiar signal combinations, such as associating money with the color green, are easier to accept than unfamiliar ones. Information about securities/industries that the investor is familiar with are perceived as less risky. Investors can take this too far when they focus their securities purchases in familiar territory rather than pursue potentially better returns “outside the perimeter.”

Hence, a case can be made that investor (false) overconfidence, fueled by immediate access to an almost infinite supply of current information, can lead to increased investment activity, overreaction to both good and bad news, and greater market volatility. Bubbles form when “herd mentality” is optimistic and break when the prevailing mood swings to pessimism. The result is more amplitude in the market roller coaster. Even with the decline in the growth of new on-line accounts, a larger percent of households are researching and purchasing their own security choices than ever before.

Contributing as much if not more to heightened volatility are institutional investors. In theory, institutional investors, formally trained and case-hardened should react to changing market conditions in a more objective, less visceral manner than individual investors, adding ballast in times of market choppiness. However, as market professionals are likely to share a common ground of training plus access to the latest technology, they may tend to react in similar fashion to new market news. Hence, improved (common) technology and similar training will amplify the response to news and increase volatility. The ultimate extension of this synergy is program trading, where the technology automatically triggers a trade in response to pre-established signals.

The Efficient Market Hypothesis proposes (among many things) that more perfect information, held by investors and market-makers, should make for greater transparency and smaller deviations of stock prices from intrinsic value. By assuming that investors are rational, EMH implicitly discounts (to zero) the behavioral/psychological aspects that cause investors to act irrationally and increase market

distortions from true value. To deny the behavioral aspect of investor behavior is analogous to insisting that economics is a physical science which marches in cadence with a predetermined set of rules, rather than a social science.

The Case for Careful Global Diversification

If more perfect information plays an unwitting hand in encouraging irrational market behavior, where should an investor of average risk tolerance turn to reduce exposure to US stock market volatility? There are several paths to risk reduction; including the domestic bond market, physical assets, including real estate, and foreign securities markets. Simply put, investment grade domestic bonds do well in a downturn, as bond prices rise in a declining interest rate environment, while investment grade quality markedly reduces the likelihood of default. However, in a strong economic environment, upward pressure on interest rates carries the potential for capital losses in the bond market which may be only partially offset by higher coupons. Presently, US stocks, based on P/E ratios, are 25% more expensive than comparable European equities, notes Ajit Dayal, investment officer at Hansberger Global Investors. Moreover, Dayal continues, emerging market stocks are 35% to 40% cheaper than US stocks. The relative attractiveness of foreign equities is compounded by a dollar which, given a \$400 billion trade deficit, remains too strong (Braham, 2002).

Hence, a more feasible strategy for all seasons is portfolio diversification in foreign securities markets. That said – foreign investment via ADR's or country funds is

not a low maintenance strategy. Given the increasing globalization of financial markets, one cannot simply assume that most foreign market returns are negatively correlated with those in the US, automatically providing ballast in the instance of US recession.

Different foreign economies are likely to cycle in and out of strength much like the sectoral rotation evidenced among US industries, and foreign economic choreography is unlikely to be synchronized with that of the US.

In 1976, Eugene Fama conducted his now-famous experiment in portfolio diversification; revealing that randomly adding stocks to a portfolio reduced risk; defined as the standard deviation of portfolio return. Using current (1988-99) economic data, Sill (2001) shows that once an investor has 15 randomly selected stocks in a portfolio, firm specific (nonsystematic) risk is virtually eliminated, leaving only systematic, or market, risk. One avenue toward lowering the remaining market (systematic) risk is to spread one's investments into foreign markets. However, this is easier said than done. With increasing global liberalization of financial markets and vastly improved investment technology, there is indication of growing convergence of returns among global financial markets, although its extent is a subject of debate.

In 1992, the correlation between the Standard and Poors 500 and the Morgan Stanley Europe, Australia, and Far East index (EAFE) was +58%. By the first months of 2002, the correlation coefficient had increased to +91% (Stein, 2002). Alternately, King, Sentana, and Wadhvani (1994) propose that increases in the volatility of factors that tend

to move markets in opposite directions may be associated with the *decline* in correlation coefficients (between paired economies), but evidence no causal relationship.

One can hypothesize that while foreign securities markets, overall, are increasingly correlated with US equity markets (approximately 45% - 50% of global market capitalization) over the longer run, they do not move in lock-step with US markets; e.g. while the US economy is in the early stages of recovery from the 2001 recession, South Korea is in a later state of recovery from its 1997 recession. Per the Dow Jones Country Index of August 1, 2002, published in the *Wall Street Journal*, year to date returns in the US and South Korea, respectively, were -22.78% and + 17.60%. In the same timeframe, Indonesian markets returned +38.74%; Austrian markets +13.72%; Thailand's markets +22.89%; and South African markets +11.22%. Focusing on the differences between comparative country returns over a longer period, the five year (1996-2001) annualized change in indices (expressed in US dollars) reflects winners: Finland (+15%), Mexico (+8%), France (+7%), Italy (+7%), New Zealand (+7%) and Korea (+5%); and losers, China (-27%), Brazil (-12%), Turkey (-7%), Japan (-7%), and South Africa (-6%) (Morgan Stanley Capital Index in *Forbes*, July 22, 2002, p. 126).

Among post-industrial nations, freer capital flow among economies would suggest that investors hold a portfolio of internationally diversified securities and that international risk-sharing would be significant. However, evidence indicates that international risk-sharing is not as pervasive as theory would have it. French and Poterba (1991) conclude that in 1989, only 4% of US investors' equity portfolios consisted of

foreign stocks while 2% of Japanese equity portfolios were invested abroad. In their 1998 paper, Tesar and Werner employ the term "home equity bias" to describe the hesitancy of investors to invest abroad. A simplified model of an "ideally" diversified portfolio would have investors linking their portfolio holdings to global capital market share. Therefore, as US financial markets have a 45%-50% of total global capitalization, American investors should be investing a greater proportion of the portfolios abroad than their present 10%, in order to reduce systematic risk.

The argument for a greater foreign presence in the average investors portfolio is a potent one. This is not to state that 50% of US investor holdings should be in foreign equities, but simply that the foreign component be expanded, as the US equity markets remain the most liquid and dominant among global markets. A crude benchmarking of the British and Japanese financial markets (second and third in market capitalization) measures each as approximately one-fifth the size of the US.

As noted previously, the strongest argument for holding foreign stocks is reducing systematic risk by expanding the system. Second, world currency fluctuations can magnify or shrink the return on investment. In 1999, the returns to US investor in German securities in DM shrink from +39.05% to +18.7% when the strengthening of the dollar against the euro is considered (when the returns were repatriated). (Hirshey, 2001). Alternately, in 2002, the weaker dollar is enhancing US investor returns in euro-denominated securities. Moreover, as the dollar weakens, foreign investors are withdrawing from US securities markets, putting downward pressure on US equity

prices. A third rationale for increased foreign security holdings is that economic growth abroad often outpaces growth in the US which reflects itself in foreign stock prices. For example, from 1985 to 1999, foreign equity returns, as measured by the MSCI EAFE index, outperformed US stocks in seven of the fifteen rolling 3 year intervals (Hirshey, 2001, p.689).

American Depository Receipts:

For the attentive, informed investor, willing to actively monitor and adjust a portfolio, American Depository Receipts (ADRs) might be the best means of investing abroad. ADRs (which imply listing on a US exchange and compliance with SEC governance) represent the strongest and most liquid foreign corporations. Specifically, an ADR represents a specific number of shares of the corporation on deposit at a bank in headquarters country. The holder of an ADR receives all dividends and capital gains in dollars; but the value of those gains will fluctuate with currency exchange rates. Per Michael Chafkin, a Citibank Vice President, over the past decade ADRs as a percent of all US investor foreign equities rose from 15% in 1990 to 40% presently. The *Citibank ADR Review*, mid-year 2002 noted that an equal-weighted Bloomberg ADR index showed an annual average return of 13% from 1997-2002, compared to 7% average returns on major US indices. ADRs represent large, multinational corporation that are internally hedged against risk by a physical presence in a number of economies. Of the *Forbes* International 500 Companies, 309 trade as ADRs in the US, and a total of 1558 foreign-based companies trade as ADRs on US exchanges (Forbes, July 22,2002, p 126.). Summarily, adding foreign stocks to a portfolio may both increase returns and reduce

risk. A foreign stock presence can buoy an investor in a market plunge, while domestic stocks will help returns during foreign market downturns, which tend to be more precipitous than in US markets (Hirshey, 2001).

European Treasuries:

For an investor who is primarily risk-averse rather than return oriented, a less disquieting entry could be made into foreign security markets through the purchase of European government bonds. While US Treasuries are the safest in the world, their present yield is anemic, with two year Treasury notes yielding (8/20/02) approximately 2.4%. Conversely, European governments have been more concerned with inflationary fears and hence offering higher interest rates on their safest securities. Specifically, German two year notes are currently yielding 3.9% and similar notes from the UK yield 4.7% or twice that of comparable US notes. Moreover, with European currencies and the euro strengthening against the dollar, US investors can earn added return from the weaker dollar, building the "risk-free" return in the relatively short run to upwards of 10%.

William Byers, a Bear Stearns executive notes that a five-year German note, currently yielding 4.4%, versus 3.8% for a comparable US Treasury, can provide an annualized return of 13%, if the euro returned to its first-issued purchase price of \$1.17 US (Lenzer, 2002). As many US brokerage houses require European bond purchases in blocks of \$50,000, purchases of international bond funds may be the best avenue to risk-averse investment in Europe (Miller, p.205).

Emerging Markets;

Sakar and Li (2002) conducted a recent study of the efficacy of foreign diversification, in terms of improving portfolio risk and return. Over a timeframe of 1976–1999, they found that US investors who added G7 stocks to their portfolio increased return by 0.6 percent per year, while investors who also add emerging nations to the same portfolio (a GLA portfolio comprised of G7 stocks plus equities from Mexico, Brazil, Argentina, and Chile,; and, from Singapore, Hong Kong, South Korea, and Thailand) see returns increase by 4.61% annually. When the salutary effects of short-selling are removed, the positive differential return (for a GLA portfolio) is 2.28% annually. Sakar and Li find that under restricted (no short selling) trading, the entire component of incremental return comes from emerging nations – and virtually none from G7 equities. Emerging country stock returns show low (+) correlations with other emerging nation stocks and G7 equities as well.

Low market correlations with other nations act to reduce portfolio risk when emerging nation stocks are included in the American investor's portfolio, risk falls by 9.7% without any benefits from short selling. (Sakar and Li, 2002)

Conclusion:

Home equity bias implies that investors, internationally, hold an excess of their portfolios in domestic equities. By expanding investment into foreign equities, US investors can reduce systematic risk by growing the system. While returns among global markets may be converging, when long run returns are considered, economies are not synchronized in the short run. Like sectors within the US economy, foreign economies

rotate in and out of real growth. Hence, investors can enhance returns (mitigate losses) by investing abroad. ADRs offer the US investor easy access to the world's largest multinational firms, providing liquidity while concurrently reducing systematic risk. However, the risk / return tradeoff markedly improves when emerging nations are added to the portfolio stew. Even though market returns are much more volatile in developing nations, their lower correlation make them a critical ingredient in diversification. The trick then becomes determining which developing country stocks are "investable;" i.e. sufficiently liquid to make them investor-friendly. Emerging country stocks which trade as ADR's would satisfy this requirement.

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