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PORTFOLIO MANAGEMENT

RETHINK THE WAY YOU INVEST

Winning Investment Strategies: Three Key Investment Principles

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An excerpt from the National Best Selling Book,
The Empowered Investor: A Guide to Building Better Portfolios
by Keith Matthews (www.empoweredinvestor.ca).

This white paper outlines the three principles of successful investing. Informing yourself of these principles is a crucial first step to ensuring your financial future. In doing so, we will be casting off the fast-food philosophy that can affect many of our most important investment decisions.

Investment Principle 1: Invest in Asset Classes

There are three types of investing: market timing, stock picking, and asset class investing. Market timing and stock picking rely on the belief that someone can predict either the future or gain by analyzing the errors of others. Wall Street and Bay Street firms spend billions trying to convince you that it is possible to out-predict the competition.

Stock picking is an attempt to identify winning stocks and presumes that someone—you, your advisor, or the newest guru—can *consistently* find under-priced securities that others have failed to discover. Market timing presumes that someone can *consistently* identify when the entire market or a market sector is over- or under-priced and sell or buy equities accordingly. To do this successfully, one needs to consistently be able to predict future geopolitical, economic, or financial events. Both of these types of investing are fueled by hype and prey on emotion rather than reason.

Asset class investing, on the other hand, is all about putting your eggs into many different baskets. It is the process of distributing and diversifying wealth in different asset classes, most typically in various types of stocks, bonds, cash, and other alternatives. Asset class investing provides insurance against things going wrong in one investment class—as is likely to be the case from time to time. Ideally, your investments should be as diversified as possible; this will afford you a steady increase over time and protect your investments from the constant fluctuations of a single kind of security. Asset class investing is a more prudent way to invest.

Even though stock-picking and market-timing forecasts grab all the headlines in the daily business newspapers and the nightly TV investment shows, research demonstrates that asset class investing is by far the most important factor in determining the variability or movement of your overall portfolio. Studies have demonstrated that asset class returns may account for between 90% and 96% of a portfolio's total value movement.[1] Figure 4 highlights the results of a study that compared returns of a large number of different portfolios, proving that the difference in variation between the portfolios could be mainly explained by asset allocation vs. stock picking or market timing.[2]

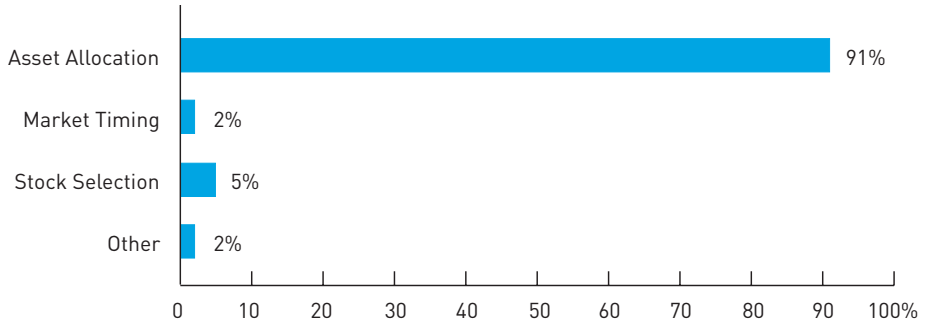
Asset Class Investing is the Healthy Alternative

Asset class investing is the most important step you can take to ensure the success of your portfolio. While it is not as sexy as stock picking or market timing, the proof is in the numbers. If stock picking and market timing are the fast-food, feel-good fix of the investment universe, asset class investing is the healthy alternative that will ensure your long-term financial well-being. Also known as asset allocation or portfolio diversification, asset class investing is one of the fundamental principles of modern portfolio theory. This ground-breaking scientific theory, which will be further discussed below, was developed by Harry Markowitz and William Sharpe who won the Nobel Prize for economics in 1990.[3]

Asset allocation is not new. Institutional pools of capital have used this methodology for decades

Figure 1: Determinants of Portfolio Performance

Source: Brinson, Singer, and Beebower. "Determinants of Portfolio Performance," Financial Analysts Journal, May 1991



and over the past twenty years it has been described in scores of articles in newspapers and specialized publications. Despite this wide media coverage, however, the methodology is often underused or misapplied by investors. Investors may buy into asset allocation strategies only to later find themselves deviating from their strategies, falling prey to emotions and investment biases and changing their investment plans. But although nothing in the markets is guaranteed, the principle of asset allocation can profoundly shift the odds in an investor's favour.

The pension funds of nearly all of Canada's largest companies, major universities, and high-net worth families implement this philosophy—the only thing standing between you and them is knowledge of these strategies.

Investment Principle 2: Diversify

Most North Americans know that portfolio diversification is important. We all want to be diversified—as long as we are diversified in the top ten funds in the two hottest sectors or in ten individual stocks that all have positive returns.

It's human nature to think this way. It was also the prevalent method of investing in the early 1900s. In fact, right up to the mid-1950s, most leading investment guides recommended that investors find a few individual stocks with the highest expected investment returns, invest in them, and ignore all other factors.

At that time, a young graduate student at the University of Chicago named Harry Markowitz dared to think differently. He believed that investors should be equally as concerned with the risks or volatility of their investments as they were with the returns. Markowitz's conclusions launched a movement that changed the way people think about investing.

The Simple Beauty of Portfolio Theory

To create a successful investment experience, investors need to understand the importance of portfolio theory. Markowitz concluded that:

- risk can be managed by diversifying asset classes; and
- combining asset classes that do not behave alike will improve the return of the entire portfolio.

What is remarkable about Markowitz's discovery is that it allows an investor to control the volatility of a portfolio and increase its return at the same

time. His landmark contribution to portfolio management hinged on the important discovery that, by combining asset classes that have good long-term prospects but *behave differently,* investors can achieve better returns with less risk. So how do we define "asset classes that behave differently"? Markowitz defined this relationship as a correlation. In layman's terms, this means asset classes that are not always in sync with one another and that may sometimes even move in opposite directions.

You can see a perfect example of asset classes that behave differently by reviewing your personal net worth statement for the period of the equity correction of 2001–2002. Compare your investment statements that held equities to the value of your personal residence. Each is an asset class with good long-term prospects; however, they are not in sync with one another. If you compare the movement of your stock portfolio with the movement in price of your real estate holdings (home, cottage, etc.), you will see that their values did not move together. Holding these two asset classes during those years would have had an interesting effect on your personal balance sheet. While your stock portfolio may have been severely affected by the bear market of 2001–2002, your home, cottage, or investment property probably saw significant appreciation during the same period thanks to the North American real estate boom. By maintaining this diversified personal balance sheet over the long term, you will experience the benefits of diversification.

The Benefits of Implementing Portfolio Theory

Applying portfolio theory to your investments has both scientific and personal benefits. Scientifically, portfolio theory offers improved risk/return ratios; in other words, you will achieve better rates of return for each unit of risk that you are willing to take. The personal benefits are just as powerful for individual investors. A diversified and structured approach to portfolio construction protects investors from many of the classic investment pitfalls and from the potential for capital destruction created by chasing hot or trendy investment ideas. This protection alone is a powerful incentive for individual investors to adopt and use the diversification approach. Portfolio theory allows investors to bring structure and logic to their investment experience.

When carefully thought through, this elegant yet remarkable investment concept has multiple benefits:

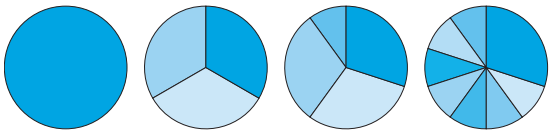
- it can protect investors from common investment pitfalls;
- it builds better rates of return per unit of risk;
- it increases the investor's ability to preserve capital; and
- in comparison with the ups and downs of traditional investing, it affords investors peace of mind.

Figure 2 (see following page) demonstrates the quantitative benefits of portfolio theory. Portfolio 1 represents a typical single asset class strategy with all capital invested in Canadian stocks only. Portfolios 2, 3, and 4 show the addition of different percentages of non-correlated equity asset classes. Adding these new asset classes into each subsequent portfolio has an impressive outcome: an increase in the rates of return and a decrease in overall risk (as measured by standard deviation). Portfolio 4 generated a significantly higher annualized return—2.4% more—than portfolio 1 with less volatility. Assuming a starting investment of $10,000 in 1980,

Figure 2: The Benefits of Portfolio Theory.

These portfolios do not represent suggested or recommended allocations but are merely examples used to demonstrate the effects and benefits of portfolio diversification. January 1980 to September 2007, returns in Canadian dollars.

* See Sources of Data and Methodology, page 13



PORTFOLIO	1	2	3	4
ASSET CLASS*				
Canadian Large Companies	100%	33.4%	30%	30%
U.S. Large Companies		33.3%	30%	10%
U.S. Value Companies				10%
U.S. Small Companies				10%
Int'l Large Companies		33.3%	30%	10%
Int'l Value Companies				10%
Int'l Small Companies				10%
U.S. REITs			10%	10%
Total	100%	100%	100%	100%
Annualized return	10.68%	11.87%	12.13%	13.08%
Standard deviation	15.94%	12.86%	12.25%	12.17%
Growth of $10,000	$166,900	$224,700	$239,700	$303,000

portfolio 4 generated $136,100 more funds than portfolio 1.

It is important to remember that these are historical numbers (1980 to 2007) and should *not* be viewed as projections of the future rates of returns for various asset class combinations. To build a portfolio you can live with, you need to focus on forward-looking expected rates of return, volatilities, and correlations of various asset classes.

To fully grasp the benefits of diversification, you need to understand what is happening at the asset class or building-block level. By comparing the characteristics (returns and volatility) of asset classes within a portfolio to the overall portfolio, you can get a better understanding of the impact and the benefits of combining non-correlated asset classes. To demonstrate this, table 1 reviews the result of a simple model portfolio that incorporates two asset classes.

Portfolios A and B (one asset class per portfolio) each generated historic returns and degrees of volatility that would be entirely acceptable outcomes in and of themselves. But can we do better? What if we decided to combine these two portfolios? How will they react together? This brings us to the concept of correlation between asset classes.

Correlation measures the degree to which two securities (or asset classes) move in similar patterns. Correlation values range from -1.0 (which indicates that the two securities moved in perfect opposition to each other) to 1.0 (which indicates that the two asset classes moved perfectly in tandem). You can calculate correlation measures between any two asset classes. If the correlation between two asset

Table 1: The Benefits of Combining Asset Classes

	RETURN	VOLATILITY
Portfolio A 1 single asset class; 100% Canadian Equity	10.68%	15.94%
Portfolio B 1 single asset class; 100% International Equity	11.15%	15.80%
Portfolio C Combination of 2 asset classes; 50% Canadian Equity and 50% International Equity	11.20%	13.71%

Source: Canadian and International Equity are represented by the TSX/S&P Composite Index and MSCI EAFE Index January 1980 to September 2007, returns in Canadian dollars.

classes is less than 1, diversification benefits exist. In most cases the correlation between traditional asset classes is positive but less than 1.

In the example in table 1, the actual correlation between large Canadian stocks (measured by the S&P/TSX Composite Index) and international stocks (measured by the MSCI EAFE Index) was 0.49 for this period. This means that the asset classes were not always going up and down together in perfect sync. When you combine the two classes to create a new portfolio—portfolio C—the volatility of portfolio C is more favourable than that of either portfolio A or B. Any rational investor would prefer portfolio C since it generated a similar—in fact, slightly better—return at a lower level of volatility: or, in human terms, more gain for less pain.

What is amazing about these research findings is that the benefits of this strategy are available to all investors—large or small, it doesn't matter—everywhere in the world. Very few things in the investment world are free for the taking; the benefits of diversifying your asset classes, however, is one of them.

It is not possible to communicate all the intricacies and subtleties of portfolio theory in a single white paper; entire books are dedicated to this very elegant concept. Although the examples above point to historical returns and analysis, one should note that these strategies were discovered in 1952, were adopted worldwide over the last several decades, and will continue to be relevant and appropriate for investors for many decades to come.

Choosing Your Asset Classes

The choice of which asset classes to include in your portfolio is critical. This decision will drive the vast majority of your returns. What should you look for when choosing asset classes? Search for asset classes that have good long-term expected returns per unit of risk and, if possible, choose those that have less than perfect correlations to each other. This will allow the benefits of diversification to materialize.

When reviewing potential candidates to include in a diversified portfolio, Canadian investors should consider the following asset classes:[4]

Fixed Income:
- Canadian government and corporate bonds
- Real return bonds

Revenue Investments:
- Canadian and global real estate investment trusts (REITs)

Equity:
- Canadian large companies
- Canadian value companies
- Canadian small companies
- U.S. large companies
- U.S. value companies
- U.S. small companies
- International large companies
- International value companies
- International small companies
- Emerging market companies

With its tenet that asset allocation is a key strategy in any successful investment framework, portfolio theory should be the financial blueprint of choice for most Canadian investors. In the next section, we will examine the ground-breaking research that builds on this strategy and can further improve your odds of investment success.

Investment Principle 3: Realize that Risk and Return are Related

Now that you are aware of the benefits of asset class investing and portfolio theory, how do you go about implementing these concepts in your portfolio? Which asset classes should you include and in what proportion? Once again, academic researchers can shed light on these difficult questions.

In June 1992 Eugene Fama of the University of Chicago and Kenneth French of Dartmouth College published a landmark study, "The Cross Section of Expected Stock Returns," in the *Journal of Finance*. By identifying market, size, and value in returns, Fama and French developed a 3-factor model for gauging returns relative to risk.

Their analysis of the sources of investment risk and return has reshaped portfolio theory, greatly improving our understanding of the factors that drive performance. Revolutionizing the way we construct and analyze asset class portfolios, the Fama/French model is an invaluable tool for asset allocation and portfolio analysis.

The Three Risk Factors that Drive Returns

Fama and French studied historical stock market returns dating back to 1927. Their research improved upon what was then known in the investment world as the single factor pricing model (CAPM) by identifying three factors that explain what drives the variation in portfolio returns. The three factors that explain the variation of returns are:

Market Factor: Stocks have higher expected returns (and higher risk) than bonds.

Price Factor: Lower-priced "value" stocks have higher expected returns (and higher risk) than higher-priced "growth" stocks.

Size Factor: Small company (small cap) stocks have higher expected returns (and higher risk) than large company (large cap) stocks.

Fama and French's conclusion that stocks are riskier than bonds and therefore carry a

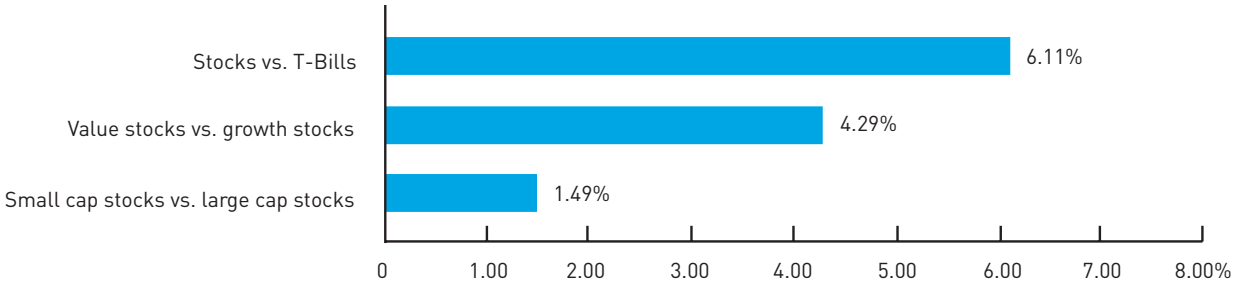


Figure 3: The 3-Factor Asset Pricing Model.

Additional returns from each factor

Source: Average annual returns February 1951 to August 2007, U.S. market, data courtesy of Fama/French

greater possibility of returns was not exactly breaking news; however, their discovery that small companies outperform large companies in returns and that value stocks far outstrip their more established cousins in growth markets was *not* common knowledge. When applied to historical data, the Fama/French 3-Factor Model can explain upwards of 96% of average equity performance.

The 3-factor model shows investors and advisors where returns come from and illustrates the various expected returns from different asset classes better than any other deciding factors (e.g., market predictions, investment TV shows, manager strategies, newsletters, or hot trendy ideas). To construct an investment portfolio that is right for you, you must decide to what extent your portfolio will be exposed to each of the three risk factors—market, size, and company value. The greater your exposure to risk, the greater the expected return. Always remember that:

- investors cannot earn higher returns without taking on greater risk; and
- total portfolio risk and return are the most important factors in constructing an investment plan.

Figure 3 compares the returns that have been generated by each of these three factors. Although the risk factor premiums given are for the U.S. market from 1951 to 2007, we will later demonstrate that these same factors are prevalent around the world.

"Cost of Capital" Drives Your Risk/Return Ratio

To explain the 3-factor equity model we must look at a company's cost of capital structure. Small companies are riskier than larger companies and thus have a higher cost of capital. This is the case when they borrow funds from the bank and should also be the case when they issue stock. Small companies should (over the long term) provide greater rates of return for investors than larger companies.

Similarly, "out of favour" or value companies are riskier than growth companies and, accordingly, have a higher cost of capital. Again, this is the case when they borrow funds from the bank and should also be the case when they issue stock. Value

companies should provide greater rates of return for investors than growth companies over the long term.

Improve Your Portfolio: Think Value

What is value investing? Value investing—also known as contrarian investing or bargain hunting—is the investment approach that looks for stocks that are out of favour, neglected, forgotten, distressed, or beaten down. Such stocks are customarily called "value" stocks; their opposites are called "growth" stocks. Academic research has confirmed what many market participants have been stating for years: "value" stocks outperform not only the broad market but also "growth" stocks.

As strong supporters of the *Efficient Market Hypothesis*, Fama and French believe the market is reasonably efficient and that, overall, it prices market securities fairly in the long run. They believe that it is very difficult to beat the market. Yet, at the same time, they have identified two classes of stocks (small company and value company stocks) that will perform better than the broad market over long periods of time. How can this be?

How does the Fama/French model explain the value effect? Fama and French believe that excess return comes only from taking on extra risk and that "out of favour" stocks are a *riskier* breed of securities relative to other segments of the marketplace. They define value stocks as stocks of companies with high book values relative to stock prices (high book-to-market ratios). Value stocks thus have higher expected returns relative to other segments of the marketplace. In Fama and French's view, the market has correctly priced these riskier securities and they should reward investors accordingly over the long term.

The more you let the concept of value investing sink in, the more it makes sense. It fact, it's not only logical, it's intuitive! Consider this: you have the choice of investing in one of two companies. One is a safe, blue chip security; the other is a large, well-known company that, due to various events, has fallen "out of favour" with investors. Which would you invest in? If you are open to investing in the "out of favour" company, surely you would want a higher rate of return. In addition, your bidding price would reflect the higher expected rate of return. In principle, this is exactly the type of evaluation process that occurs daily in every equity market around the world. Riskier companies should have higher expected returns than safer companies.

Stocks become undervalued for a variety of reasons, such as an overall decline in the industry sector or a specific company falling out of favour. When these situations occur, a company's stock price may fall even though its underlying book value remains unchanged. Modest or significant changes in an industry can generate anxiety about the future and create opportunities for investors to pick up bargains.

As table 2 shows, the value effect exists in all major global markets. Over long periods of time, value stocks have demonstrated higher returns than the returns in broad market or growth stocks.

Savvy investors worldwide recognize that value investing is a better way to invest for the long term. The strategy is under-utilized, however, because of investment hype, performance chasing, and the short-term focus to which many investors succumb in their investment thinking. For these reasons, it may be a little-known truth that value companies regularly outperform growth (or "high profile") companies, despite the confirmation of numerous studies on different markets by various researchers.

Table 2: Value Stocks Outperform over the Long-Term

ASSET CLASS	PERIOD OF STUDY	VALUE STOCKS	BROAD MARKET	GROWTH STOCKS
Canadian Large Companies	1977–2006	**12.36%**	12.15%	9.08%
U.S. Large Companies	1927–2006	**11.54%**	10.41%	9.34%
U.S. Small Companies	1927–2006	**14.51%**	12.05%	9.33%
International Companies	1975–2006	**18.03%**	13.41%	n/a
Emerging Market Companies	1989–2005	**17.74%**	13.53%	10.99%

Source: Dimensional Fund Advisors and E. Fama/K. French.[5]

Investors have a marked tendency to invest in "growth stocks." These growth companies typically have high profiles, a glamorous image, and plenty of positive print in the newspapers. But do these high profile companies make for good investments? Will they produce interesting expected returns on a go-forward basis? Research has shown that they are not necessarily bad investments, but they are investments with *low expected returns*.

Investing in Excellent Companies (Growth Stocks) vs. Unexcellent Companies (Value Stocks)

In 1987 an interesting research report, *In Search of Excellence: The Investor's Viewpoint*, studied two types of companies: excellent companies and unexcellent companies. By all measures, the financial ratios of excellent companies were significantly stronger than those of unexcellent companies (see the six financial ratios in figure 4); investment in the "riskier" unexcellent companies, however, produced higher investment returns (see figure 5).

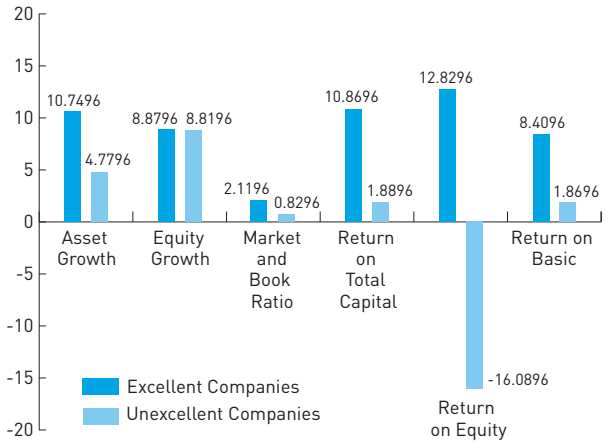


Figure 4: Excellent vs. Unexcellent Companies

U.S. companies 1981–1985 / U.S.$

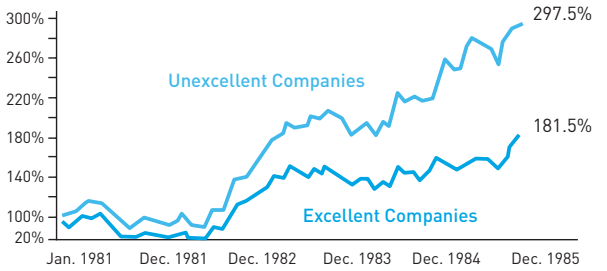


Figure 5: Excellent vs. Unexcellent Companies

U.S. companies 1981–1985 / U.S.$

Source: M. Clayman, "In Search of Excellence: The Investor's Viewpoint," Financial Analyst Journal, May–June 1987, 63.

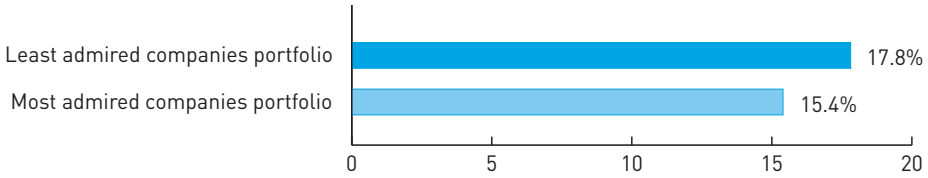


Figure 6: The Underdog Wins

Stocks of firms with lower scores on the "Most Admired" list bested those ranked highest. Compound stock returns from 1983 to 2006.

Source: Anginer, Fisher, and Statman, chart, Fortune, 5 March 2007

Companies With the Top Reputations Do Not Always Have the Best-Performing Stocks

In a 2007 study, researchers compared the stock returns of the companies with the highest rankings on *Fortune Magazine*'s "Most Admired Companies" list to the returns of the companies with the lowest rankings on the list.[6] Reviewing stock returns from 1983 to 2006, researchers found that the stocks of firms with lower scores actually did better than the stocks of firms with the highest scores (see figure 6). In addition to weaker reputations, the least admired companies had two distinguishing features. Firstly, the companies at the bottom of the list had lower valuations such as stock market price to book value ratio. Over the twenty-three years of the study period, the average price-to-book ratio of the most admired companies was 2.07 compared with 1.27 for the least admired group. Secondly, the least admired companies tended to be smaller than the most admired companies and—as we will highlight later in this white paper—investors can often obtain higher returns by investing in small, out-of-favour companies than in large, highly-valued ones.

Executing Your Value Investing Strategy

Any diversified portfolio can include the value effect in its Canadian, U.S., international, or emerging market stock components. When adding value to your portfolio, remember these key execution strategies:

- Capture your value effect by investing in a diversified basket of high book-to-market ratio securities ("value stocks") rather than choosing a few distressed securities through "stock picking." The latter approach is far too risky.
- As with any other investment style, value stocks go in and out of favour and require an investment strategy with long-term discipline (ten years and longer).
- Use transparent portfolio management tools that offer pure exposure to the value factor, guaranteeing control over your total investment strategy.

Improve Your Portfolio: Think Small

The last decade has provided dramatic evidence of the benefits of diversifying your portfolio by including small capitalization stocks. Small company stocks have increased steadily in value since 1999, whereas large company growth stocks experienced significant setbacks in the correction of 2001–2002. A portfolio that included an allocation to a diversified group of small companies would have weathered the storm much better than a portfolio entirely allocated to large companies.

Table 3: Small Value Company Stocks Outperform over the Long Term

ASSET CLASS	PERIOD OF STUDY	STOCK RETURNS	STANDARD VOLATILITY
Canadian Small Value Companies	1991–2005	**13.98%**	17.81%
Canadian Broad Market	1991–2005	11.95%	15.09%
Canadian Small Growth Companies	1991–2005	12.59%	23.29%
U.S. Small Value Companies	1927–2006	**14.51%**	34.51%
U.S. Small Companies	1927–2006	12.05%	30.85%
U.S. Broad Market	1927–2006	10.41%	20.20%
U.S. Small Growth Companies	1927–2006	9.33%	34.11%
International Small Companies	1977–2006	**18.23%**	28.11%
International Broad Market	1977–2006	13.41%	21.27%

Source: Dimensional Fund Advisors and E. Fama/K. French. See note 5.

The small company effect was first identified by Rolf Banz from the University of Chicago. In 1981 he published a report based on his analysis of NYSE companies from 1926 to 1975, concluding that, in the long term, small companies have higher expected returns than large companies, and that they behave differently.

Table 3 shows that, as with value stocks, the small company effect exists worldwide. This is apparent from their higher returns relative to their large company rivals. For example, as a group, Canadian small value companies outperformed Canadian broad market companies, as did U.S. and international small company stocks relative to U.S. and international large company stocks. Interestingly enough, when compared to other segments in the same marketplace, the market segment with the highest returns was small-value companies. This is what we would expect based on Fama/French research: small companies that are also out-of-favour companies would be the riskiest group of companies and should therefore have the highest expected rate of return.

Steer Clear of Small-Growth Companies

Ironically, investing in small-growth company stocks offers little in the way of portfolio management benefits. As noted in table 3, investors do not appear to have been compensated for the additional risk that they take when they invest in small-growth companies. In fact, many investors incorrectly invest in small-growth companies (either by buying stock in individual companies or buying mutual funds that invest in small companies with very high P/Es) with the expectation of seeing spectacular returns. Unbeknownst to them, they are buying an asset class that has historically generated disappointing returns with a lot of additional volatility or risk. If you want to increase your

expected returns and are prepared to accept higher levels of volatility, you should look at investing in either small-value or small-blend company stocks and you should think twice before investing in small-growth company stocks.

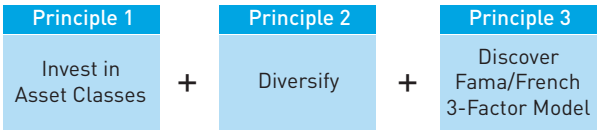


Figure 7: The Three Principles of Investing

Executing Your Small Company Strategy

Any diversified portfolio can incorporate the small company effect in its Canadian, U.S., or international stock components. As with value stocks, keep these key execution strategies in mind when adding small companies to your portfolio:

- To capture the small company effect, invest in a diversified basket of small-value or small-core stocks. Do not choose a few small company securities through "stock picking."
- Like any other investment style, small company stocks go in and out of favour, sometimes for very long periods. They require an investment strategy with long-term discipline (ten years or longer).
- Use transparent portfolio management tools that will provide pure exposure to small companies and guarantee your control over your overall investment strategy.

Bringing It All Together

The three investment principles discussed in this white paper and summarized in figure 7, are the key components to greater returns in your portfolio. Together they bring structure, knowledge, and discipline, and provide the necessary foundation that will allow you to tilt the odds dramatically in your favour. Backed by years of capital market research, these principles are time-tested, proven ways to invest your money for the long term.

As a final note on these risk factors, it is important to remember that the additional returns from investing in value and small company stocks are not guaranteed to materialize in your portfolio on an annual or even short-to-medium-term basis. Investors who invest in small and value companies must sometimes endure long, difficult periods of under-performance relative to general equity returns. Before investing in small and value company asset classes, investors should review their investment objectives, time horizons, tax considerations, and tolerance for risk and uncertainty.

Patience, a view towards long-term asset allocation, and a belief in investment philosophy are essential if you are to successfully include these asset classes in your portfolio.

NOTES

1. Brinson, Singer, and Beebower, "Determinants of Portfolio Performance 2," *Financial Analysts Journa*l, May 1991. Brinson, Singer, and Beebower assessed the impact of passive (benchmark) and active asset allocations and security selection on eighty-two large pension plans over the 1977–87 period. They found that, on average, benchmark asset allocation (allocation policy) explained 91.5% of the variation in quarterly returns. In other words, in this sample the decision to invest in asset classes (stocks, bonds, etc.) was more important than the selection of individual

securities. The predecessor study, "Determinants of Portfolio Performance," looked at the returns of ninety-one large pension funds from 1974 to 1983 and found that, on average, 93.6% of the total variation in actual plan results could be attributed to asset allocation decisions. Less than 5% of the returns were determined by security selection.

2. Brinson, Singer, and Beebower, "Determinants of Portfolio Performance 2," *Financial Analysts Journal*, May 1991.

3. Harry Markowitz's landmark research on portfolio theory was first published in 1952 in an essay entitled "Portfolio Selection." He later authored a book entitled *Portfolio Selection: Efficient Diversification* (1959). Markowitz's work on portfolio theory may be regarded as the foundation for applications of economic analysis in portfolio management.

4. Before investing in any one of these asset classes, you should review your investment objectives, time horizons, tax considerations, and tolerance to risk. As part of the portfolio construction process, calculate the forward-looking expected rates of return for all asset classes. You will only be able to construct an intelligent long-term asset mix after you have reviewed these key features. You should then bring your personal objectives, proposed asset class mixes, implementation, and monitoring actions together via an action plan, better known as an investment policy statement.

5. In U.S. dollars. Data on the value and growth index of developed markets provided by Fama/French, *ex utilities*. The S&P data were provided by Standard & Poor's Index Services Group. CRSP data provided by the Center for Research in Security Prices, University of Chicago. International small index data: 1970–June 1981, 50% U.K. small cap stocks provided by the London Business School and 50% Japan small cap stocks provided by Nomura Securities; July 1981–present, compiled by Dimensional from StyleResearch securities data and includes securities of MSCI EAFE Index countries, market-capitalization weighted, with each country capped at 50%, and rebalanced semi-annually. MSCI data copyright MSCI 2007, all rights reserved. Standard deviation is a statistical measure of risk. Generally speaking, the higher the standard deviation, the greater the risk.

6. Deniz Anginer, Kenneth L. Fisher, and Meir Statman, *Stocks of Admired Companies and Despised Ones*, February 2007.

SOURCES OF DATA AND METHODOLOGY

Not all the indexes mentioned are available for direct investment. The figures given represent total returns in Canadian dollars. **Canadian Large Companies/Canadian Companies**: S&P/TSX Composite Index. **U.S. Large Companies**: S&P 500 Index. **U.S. Value Companies**: DFA Canada U.S. Value Index, November 2003–present; DFA Canada U.S. Value Fund, Class F, April 1993–October 2003; Dimensional's U.S. Large Cap Value Portfolio (offered in the United States only), February 1951–March 1993: Fama/French U.S. Large Value (excluding utilities) Simulated Portfolio. **U.S. Small Companies**: DFA Canada U.S. Small Cap Index, November 2003–present; DFA Canada U.S. Small Cap Fund, Class F, April 2001–October 2003; DFA U.S. Small Cap Portfolio (offered in the United States only), April 1992–March 2001; DFA U.S. 6–10 Small Company Portfolio, October 1988–March 1992; DFA, CRSP Database (AMEX, NYSE, and NMS), January 1973–September 1988; CRSP Database (AMEX, NYSE, and NASDAQ), July 1962–December 1972; CRSP Database (AMEX and NYSE only), February 1951–June 1962; NYSE, rebalanced semi-annually. **International Large Companies**: MSCI EAFE Index (net dividends). **International Value Companies**: DFA Canada International Value Index, November 2003–present; DFA Canada International Value Fund, Class F, March 1994–October 2003; DFA International Value Portfolio (offered in the United States only), July 1993–February 1994; DFA International High Book-to-Market Portfolio (offered in the United States only), April 1993–June 1993; MSCI EAFE Index, January 1975–March 1993; International High BtM (Value) Val-Wtd Unhedged $ (Top 30% BtM), simulated DFA strategy (max Japan 38%), courtesy Fama/French and MSCI, includes Japan, Great Britain, France, Germany, Switzerland, the Netherlands, Hong Kong, Australia, Italy,

Belgium, and Spain (rebalanced quarterly). **International Small Companies:** DFA Canada International Small Cap Index**,** November 2003–present; DFA Canada International Small Cap Fund, Class F, October 1996–October 2003; DFA International Small Company Portfolio (offered in the United States only), January 1970–September 1996; Various Wts DFA Japan, Continental Europe, United Kingdom, Pacific Rim (international data). **U.S. REITs**: Dow Jones Wilshire REIT Index.

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