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# MYTH-BUSTERS

Do the value and small cap premia really exist?

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**TONY BELL**  
Peregrine iQ

# Myth-busters

## Do the value and small cap premia really exist?

**I**NVESTORS BY THEIR very nature want to choose the best unit trusts or manager who can add alpha. This particular issue looks at whether value-based investing or specialist small cap investing can provide a better chance of capturing alpha. And if those areas of the market offer excess return can they not simply be captured in new generation products, such as fundamental indices or smart beta at much lower cost than active equity managers charge?

These topics are hotly debated. The reports in this edition present a collection of these debates and draw a thread through each so the essence can be understood in non-technical terms. Everything isn't always as it seems – or, as Albert Einstein said: "Not everything that can be counted counts, and not everything that counts can be counted."

In finance, share prices are seen to reflect all information known to all market participants at any point in time. That concept – known as Efficient Market Hypothesis – means shares always trade at their fair value, making it impossible for investors to either buy undervalued stock or sell stock at inflated prices.

That being the case, investors should simply invest in the market as represented by an index. Adrian Saville – in his report *Winning the loser's game* – argues that while EMH may have some validity, and while most active managers don't outperform the index, the emphasis is on the word "most".

The report describes a study conducted over a 20-year period drawn from 13 of the world's largest equity markets that aims to prove value investing conclusively beats the market. Why is that the case when markets are deemed to be reasonably efficient? Surely the study proving the merits of value-based investing is at odds with the EMH? Furthermore, if it's that easy to find, why not simply replicate it at low cost?

In his report – *The systematic alpha paradox* – Grant Irvine-Smith explores what alpha is and shows why alpha is a little elusive and can only be measured and explained

once it's been generated. Irvine-Smith eloquently links the seminal work by Fama and French to this elusive alpha component by explaining how true alpha is the residual after taking into account the value and small cap premia.

The report observes that fundamental indexation is a product that captures a portion of the value element systematically. Irvine-Smith concludes true alpha originates from objective decisions about the merit of a specific investment opportunity at a specific point in time. Thus, if asked to explain your source of alpha, what is really meant is "explain your additional (to the market) beta sources" as true alpha can't be defined in advance.

Piet Viljoen in his report – *Nobody's baby now* – tackles that value component in his own inimitable style. He argues that short-term markets are nothing more than an aggregation of perceptions, don't conform to the EMH. Indeed share prices are at times so far removed from their true or fair value that significant opportunities exist.

However, buying shares at such deeply discounted levels – in the expectation the share will return to some degree of fair value – may require high levels of intestinal fortitude on the part of the investor. As Keynes once remarked: "There's a particular zest in making money quickly, and remoter gains are discounted by the average man at a very high rate."

Hard as it may be to find value on the main board of the JSE, looking for value in the small cap sector is perhaps even more challenging.

Ricco Fredrich looks at a range of pitfalls in his report – *The elusive small cap premium*.

Heidi Raubenheimer in her report – *Factor mimicry and dependence* – brings us back to the value, size and momentum factors and shows that while some benefits do indeed exist in pursuing those as alpha generating strategies, significant pitfalls await the unwary investor who misconstrues or misunderstands the dynamics of each.

Tim Gebbie in his report – *Faking value*



3 and size – expands on this by showing how easy it is to misinterpret implied alpha as true alpha. Gebbie demonstrates that much of the alpha generated by the various factors is nothing more than a product of a concept called “crossover” – a highly technical but worthwhile read.

Ending off the series, Yashin Gopi draws from Professor Andrew Lo’s work in which he reconciles the way investors behave with the notion that markets are efficient. The approach is called the “adaptive market hypothesis” which advocates that financial markets adapt and change over

time. Yesterday’s norms will not be tomorrow’s norms.

In the final analysis, some degree of truth exists in each of the arguments. In some way, the notion of capturing alpha is a little like trying to capture the wind. Sometimes it’s there, sometimes it’s not. ■

## Two New *Collective Insight* Websites

**COLLECTIVE INSIGHT** would like to announce the launch of two new websites: [www.collectiveinsight.co.za](http://www.collectiveinsight.co.za) takes readers to an archive of previous *Collective Insight* articles and a newly revamped search engine. The ASISA website [www.aci.co.za](http://www.aci.co.za) takes you to the full text of these articles and other related South African research.

## IN THE NEXT ISSUE...

**THE TOPIC FOR OUR** next issue is “The value chain in investment decision-making – who should really be doing what on behalf of trustees?” The roles of different players in the value chain have evolved considerably over the past few years. Currently, there’s considerable debate about how investment decisions by fiduciaries of pension fund assets should be made.

Not only is it an issue of who should do what, but now – with the lines blurring between consultants, FFA’s, asset managers, multi-managers and research houses, and the evolving roles of fiduciaries – there’s debate

about who is best equipped to recommend the most sensible answers. Some puzzling issues are liability modelling, the structure of the optimal solution to meet member demographics, manager selection, mandate and benchmark setting and others.

What does that all mean for trustees and how will the industry evolve over the next 10 years? More importantly, are we entrenching the right principles in PF 130 given those insights?

Articles can either be directed to the lay reader as an introduction to the topic or they can be directed to the profes-

sional who could benefit from a more substantive debate on the topic. Authors wishing to contribute should vet their topic choices with us first to minimise overlap. Please contact the advisory committee convener, Anne Cabot-Alletzhauser, on (011) 575-4333, with your topic ideas. Articles (approximately 1 200 words, plus illustrations) need to be submitted to [matsholom@collectiveinsight.co.za](mailto:matsholom@collectiveinsight.co.za) by 29 January 2010.

Please remember: This is a research publication and, as such, please no market commentary or marketing materials. ■



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# Winning the loser’s game

**IN 1976 THE FIRST FUND** designed to track the S&P500 index was launched. Since then, the growth in tracker funds and other passive vehicles designed to match, rather than beat, market performance has been exponential. To a large extent, investors’ attraction to passive investing is explained as most active managers fail to beat the market. As graph 1 shows, in a study of United States-based equity managers, most actively managed funds failed to beat the benchmark between 2003 and 2008, regardless of whether performance was measured over one, three or five years.

While damning of active management, the above result

is unsurprising. Nowhere is this better established than in Nobel laureate William Sharpe’s 1991 paper *The Arithmetic of Active Management (Financial Analysts’ Journal, Vol 47)*. In this paper Sharpe showed it’s mathematically impossible for the average investor to beat the market. The reason is simple: the average investor is the market. That means, after costs, the average investor must do worse than the market.

### Is alpha a myth?

Given the above, is all active management doomed to fail? And is the alpha sought by active managers a myth? The answer to both questions is a resounding

“no”. While most investors are beaten by the market that is not the case for all investors. Rather, some active managers must deliver alpha and, in so doing, beat the market.

More importantly, the managers that outperform and deliver statistically significant alpha do so in a recurrent fashion and exhibit common attributes. In other words, the investment performances of those managers aren’t explained by luck. In turn, such performances suggest markets aren’t perfectly efficient. Critically, if that’s the case alpha isn’t a myth.

Specifically, the investment attribute that dominates the small set of active managers who



« beat the market is the practice of value investing. In modern times the best demonstration of that result is Gene Fama and Kenneth French's work, which was published in the early Nineties and showed that small cap stocks and stocks with a low market-to-book ratio, or value stocks, delivered excess returns. Later, in their 1998 paper *Value versus Growth: The International Evidence* (*Journal of Finance, Vol 53*), Fama and French demonstrated that the value effect extended from the US market into global markets.

The now-famous results of that study are summarised in graph 2. From that it's evident – over the period 1975 to 1995 – value stocks outperformed growth stocks and the general market by average annual margins of 5.8% and 2.9% respectively. Significantly, the results are drawn from 13 of the world's largest equity markets that collectively represent more than four-fifths of the world's market capitalisation over the period.

### Winning the loser's game

Given the force of the above effect, why do investors not simply embrace active value investing to achieve alpha? The answer is at least two pronged.

First, by definition value investing involves building portfolios at odds with popular sentiment. Owning out-of-favour investments is contrary to the human instincts of herding and finding safety in numbers. To borrow from John Maynard Keynes, investors consider it better for their reputation to fail conventionally than to succeed unconventionally. In other words, while being contrarian is a necessary attribute to building a portfolio of out-of-favour, under-owned and unloved value stocks, it's a position the majority simply find too uncomfortable to maintain.

Second, even if investors are able to discipline themselves into holding a value portfolio, by definition the majority can't own a value portfolio. To explain that

point, value stocks have lower-than-market price:earnings and price-to-book multiples. By contrast, growth stocks have higher multiples and often stronger-than-market price momentum behind them.

In other words, all else being equal, measured by market capitalisation, growth companies are larger than value companies. Thus, all equity markets have a greater weight of capital in growth companies than value companies. Extending William Sharpe's argument presented earlier, just as it's impossible for the average active investor to beat the market, it's impossible for the average active investor to own a value portfolio. By definition, value investing is confined to a minority.

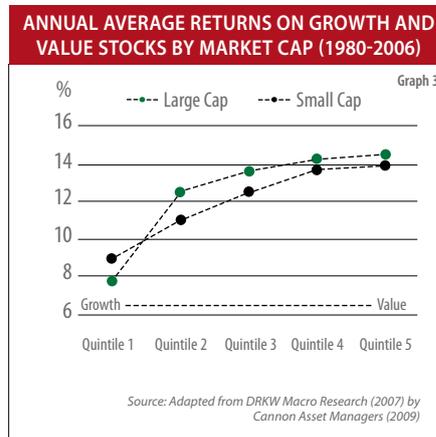
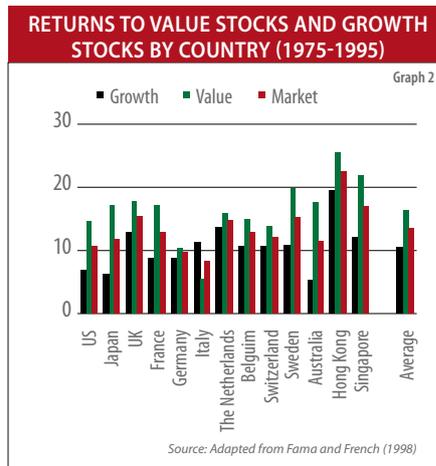
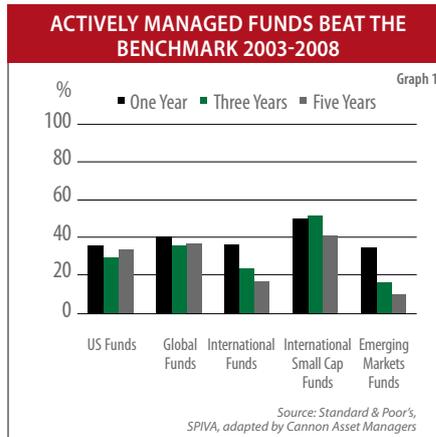
This flags an important side issue. Specifically, while the value effect is biased towards smaller cap stocks this doesn't mean value investing doesn't work among larger-cap stocks. To the contrary: the available evidence shows value investing works across large and small cap stocks (see graph 3).

The above arguments imply that value stocks have smaller market caps than growth stocks. Put simply, the value premium and small-cap premium aren't myths.

However, those premia are available only to a minority of investors, which explains Warren Buffett's sentiment that "a low-cost index fund is the most sensible equity investment for the great majority of investors. My mentor, Ben Graham, took this position many years ago and everything I've seen since convinces me of its truth."

Thus, the failure of active management compels investors into a passive mandate. Tragically, passive mandates themselves are a loser's game – because they're designed to match the market, not beat it, and once costs are taken out no passive fund can deliver better-than-market performance.

That said, while there are superior forms of passive investing – such as the ownership of a position in a passive value fund or fundamentally indexed fund – the only investment method that demonstrates the ability to consistently deliver better-than-market returns is an active value approach that effectively harnesses the small cap and value premia. ■



# The systematic alpha paradox



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## “EXPLAIN YOUR ALPHA.”

A typical question in manager selection due diligence questionnaires. Usually phrased as “please describe the market inefficiencies you have identified, how your investment process exploits those and why you believe those inefficiencies will persist into the future”. But what exactly is alpha? And beta? And once those are defined how do you measure skill?

While many investors simply refer to alpha as the difference between the performance of a fund and its benchmark, theoretically alpha is a statistical concept, referring to that part of a linear regression equation that can't be explained by the variables of the model.

When measuring the performance of a fund we're generally interested in the return of the fund relative to that of a benchmark. In that case, when decomposing a fund's return, the return of the benchmark is seen as the systematic variable and alpha is that component not explained by the fund's exposure (or beta) to the benchmark.

Extending that one-factor model, Fama and French argued that there are two classes of stocks that have tended to do better than the market as a whole: small cap and value stocks, albeit at higher risk. They therefore argue returns earned from those sources are systematic and propose that true alpha should be measured as the return earned after adjusting for the market return as well as any small cap and value premiums.

Coming back to the question of “Explain your alpha” it would appear that wording is at odds with the technical definition of alpha, as alpha is the component that can't be explained by the model parameters. Therefore, that request will appear paradoxical to a statistician, since it

implies an “under-fitted” model: if we could explain the alpha in a systematic way we'd have included those additional variables in the model, effectively shifting alpha to beta.

Before Capital Market Theory was introduced, concepts such as alpha (non-systematic return) and beta (exposure to a source of systematic return) were unknown to investors. Now investors can choose between a wide array of products from beta only (index ETFs) to alpha only (market-neutral hedge funds) and every point in between.

Let's take a look at four broad categories of funds and how they combine systematic and non-systematic components of return to generate performance.

Proponents of the Efficient Market Hypothesis<sup>1</sup> advocate investing in a mix of the market index and cash. The proportion in the market is determined by your level of risk aversion. Active managers therefore can't outperform the market over time without the use of leverage. In that case the return of the fund will simply be a function of its exposure (or beta) to the market and such investors will invest in line with the composition of the index to which they're benchmarked.

In a 2005 report, Arnott, Hsu and Moore<sup>2</sup> questioned the efficiency of using standard market cap weighted indices as a proxy for the CAPM “market portfolio”. They introduce the concept of fundamental indexation, where an index is created by weighting stocks by economic fundamentals (such as book value, sales and/or earnings) instead of market capitalisation. While that strategy was originally sold as a way of profiting from mis-pricings in the way indices are calculated it's now generally accepted that those strategies are active strategies, making use of systematic sources

of return. Most of their success could be attributed to having a value bias.

The next step on the scale is active quantitative strategies. Quantitative portfolio managers believe fundamental stock-picking isn't the only strategy that can outperform the market, and that it's possible for investors to tap other sources of systematic inefficiencies. Where a fundamental indexation strategy typically looks at a handful of factors based on historical data and then tracks that index, quantitative strategies are more flexible. They include more factors using a range of data sources, employing more sophisticated factor weightings and utilising advanced portfolio construction algorithms to ensure optimal risk/return characteristics.

Finally, most portfolio managers believe the efficient market hypothesis doesn't hold and build their strategies on in-depth bottom-up stock analysis. Value and growth strategies are examples of fundamental stock-picking strategies that combine a systematic component with a non-systematic stock-picking element. Other portfolio managers follow a style-agnostic approach, focusing only on bottom-up stock selection.

As you can see, all these strategies have slightly different views on how alpha should be defined and how it should be derived. That shifting of alpha to beta has been the topic of much debate between practitioners and academics.

Fees are at the root of these debates. The argument is that beta (whether beta to the market or beta to some other factor) is systematic, thus easy to create and therefore should be free or close to free. On the other hand, alpha is rare, difficult to produce and should be rewarded.

The controversy begins when

6 additional systematic sources are added to traditional market beta. For example, should investors pay the same fees for passive fund tracking the All-Share index as they would for a fundamental index fund? And should a value manager's alpha be calculated from a regression against a range of value factors in addition to the market, effectively substituting the standard market cap index as benchmark with an appropriate fundamental index?

What would happen should indices such as those be broadly adopted as benchmarks? Consider the theoretical case of a closed SA market and suppose the majority of investors agreed on an appropriate fundamental index: earnings weighted as a benchmark. Stocks with high earnings relative to capitalisation (low p:es) would have higher than market cap weightings and vice versa. Were enough investors to adopt that benchmark

we'd see excess demand for those low p:es stocks and equilibrium would be restored as their prices adjust upwards.

Ironically, the success of that benchmark would be its own demise. Its theoretical conclusion would be the earnings weighted and cap weighted weights would converge (implying all stocks trading on the same p:es). This highlights a key requirement of a fair benchmark: it should be representative of the opportunity set of available investments. Fundamental indices don't meet that requirement.

So when you ask a manager to "explain his sources of alpha" what you mean is "explain your additional (to the market) beta sources". While the answer to the question "where do you expect your future alpha to come from" is: "I don't know – I'll know it when I see it." True alpha originates from subjective decisions on the merit of a

specific investment opportunity at a specific point in time. Any reference to generic "favourite stock" characteristics, situations or investment style is beta.

Does that mean only pure alpha should be rewarded? We believe not. It takes market knowledge, creativity, judgment and technical skills to understand the systematic forces that drive the market. How you can profit from those and build the sophisticated models required to manage a quantitative fund but requires a high level of skill.

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## Returning to simple values

**T**HE EQUITY RISK PREMIUM has been hotly debated for many years. The centre of that debate is the extensive research by Ibbotson Associates in the United States. Understanding the equity risk premium forms a critical part of equity valuation and broad asset class valuation. It's used in the capital asset pricing model (CAPM), Fama and French's three-factor model and in any process where return expectations are built on to the risk-free rate.

There is agreement that the equity risk premium exists over the long term, how it behaves over the short term and the way in which market corrections (which are short term by nature) influence the premium is an ongoing discussion. Research Affiliates, a US-based asset manager, further argues that we base our decisions about the future on

investment theories based on the past<sup>1</sup>. Once we believe the future will be like the past we no longer examine our core assumptions but base our investment decisions on theories.

Is that the case with the equity risk premium in South Africa? It appears to me that instead of applying theory to obtain an often misjudged equity premium to portfolios we should return to basics. The equity risk premium in the SA market, with particular regard to the value philosophy and its associated risk premium will be discussed further.

The equity risk premium certainly exists in SA. If you consider data between 1925 and 2008, equities on average outperformed the cash rate<sup>2</sup> by 9,5%/year.

Considering monthly data, cash provided better returns than equities 40% of the time. On a rolling 12-month basis cash

outperformed equities 34% of the time and reached 54% in May 1970. However, when equities outperformed cash it could be by large margins, as was experienced in July 1980, where the difference was 110,1%.

A factor complicating the equity risk premium debate is that equity yields and cash yields don't move in tandem: in fact, they move in opposite directions. The economic environment favourable to cash yields isn't necessarily favourable to equity yields. According to acsis research, low and declining interest rates on average lead to gains in excess of 25%/year for equities, whereas rising and high interest rates cause cash to outstrip the returns on equities<sup>3</sup>.

So if the equity premium exists, how is it calculated? Generally, investors make one of two mistakes when calculating the equity

8 risk premium. They can underestimate the risk-free rate, particularly when inflation is rising. That can be especially problematic in emerging markets, where inflation tends to spike aggressively.

Investors can also overestimate returns on equities, which may lead to euphoria as they start forecasting higher returns, believing their favourable short-term gains are the norm.

James Montier, formerly of Dresdner Kleinwort Wasserstein, argues strongly against using forecasting as a tool in expected returns<sup>4</sup>. When the market correction finally occurs it's often during a time when the equity risk premium was at its highest and investors thus suffer from a collapsing equity premium. This is where the value philosophy has the upper hand, as it will result in cheap stocks being favoured in a portfolio. Those have indirectly collapsed in price and should then provide a larger future equity risk premium.

There's a vast difference between risk and uncertainty, as per Nassim Taleb's view (the author of *The Black Swan*), as well as Robert Schwartz, who claims risk is quantifiable and measurable whereas uncertainty is a much bigger problem, as you don't even know what the probability distribution looks like<sup>5</sup>. If you compare the current market to the market of 50 years ago there's a marked difference in its liquidity: 50 years ago the only investors in the market

were professionals. Now anyone can own an online stock broking account and trade anything from simple equities to complex derivative instruments. That ability to buy, sell and leverage on a whim means vast groups of often uninformed investors capable of swinging markets. This drives uncertainty.

Irrational behaviour further complicates the situation. And irrationality can only worsen as the number of participants in the market increases. Thus the equity risk premium could go from normal to abnormal in much shorter bursts of time. Investors can only surmise at what drives the market. They can easily get caught in the euphoria of a market and indirectly find themselves on the wrong end of a collapsing equity risk premium.

The answer might be as simple as buying those stocks that are cheap. When you invest in value stocks you don't assume you know how the market works. You simply stick to the basic tenet of not overpaying for an asset. Once bought it's merely a waiting game as the economy (or sector) returns to growth and the market starts appraising assets fairly again. Does this work?

The superiority of that investment style is well documented. A study by Fama and French (1998) indicates a value portfolio invested over a period of 20 years throughout 13 countries (in equal weights) would have outperformed its growth counterpart by 300%. It also outperforms the market and indirectly the cash rate, which indicates a value risk premium.

That very same phenomenon exists in SA. A 13-year study conducted by Cannon Asset Managers<sup>6</sup> indicates the superiority of picking value stocks at the beginning of a year and then holding them for a year. A portfolio of low-rated stocks (called dogs) is compared to a portfolio of highly rated stocks (called diamonds). The 13 portfolio sets have an average of 47 stocks

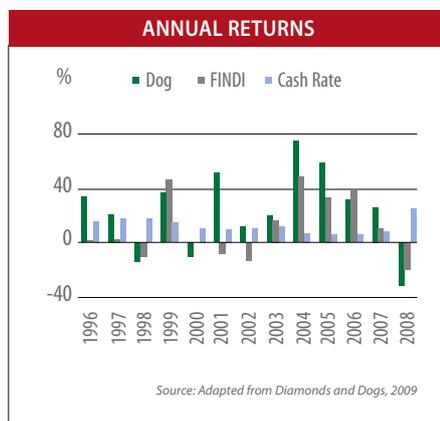
included, thus allaying any concentration criticism. Only profitable businesses are included in the portfolios, thus giving them the best chance of survival. However, RESI is excluded because, according to the study, earnings aren't necessarily the only driver for returns in those stocks. The only valuation metric utilised is the earnings multiple to identify the stocks.

The results of the study are staggering. An average value risk premium of 12% over the period was identified, whereas the FINDI risk premium was -0,47%. Indirectly (and probably most importantly) the dog portfolio created an average rate of return of 24,24%/year over the period, double the rate of return in the market. The value equity risk premium exists for most of the 13-year period, but there were three distinct periods during market downturns when holding value stocks took longer than a year to bear fruit. That points to the fact stocks generally are an asset best held over the long term.

So the simple value approach seems to work. Investors don't need to forecast an average equity risk premium for their portfolios. They merely have to assume a value mindset and let the risk premium take care of itself.

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# Nobody's baby now

*I've read the poets and the analysts  
Searched through the books on human behaviour  
I travelled this world around  
For an answer that refused to be found  
I don't know why and I don't know how  
But she's nobody's baby now*

*Nobody's baby, by Nick Cave*

**T**HE STOCK MARKET is just a casino for many people. There's a misconception easy money can be made by applying simple rules – like the one in blackjack, where you draw on 16 or less. ("Rand Hedge", "Commodity Supercycle", etc – pick your poison). Unsurprisingly, the house always ends up winning. No wonder the stock market leaves most people feeling as rudderless as the punters at a casino.

Over the short term stock markets are complicated where prices are a result of a huge guessing game. Investment decisions are based on the immediate outlook for a company rather than its underlying value, as determined by the company's ability to generate cash flows over the long term. That outlook is generally an extrapolation of current economic conditions. When those conditions change – as they invariably do – confusion reigns and the ultimate outcome is poor returns. How else can you explain the

fact that within the space of 12 months the price of Anglo American has fluctuated between R550 and R150/share?

In table 1 we estimate the cash flows accruing to the owners of Anglo American. Start with an estimate of the normalised cash flow of R10/share and increase it annually by 10%, resulting in a real growth rate of around 3% to 5%/year. This is a growth rate strong companies such as Anglo should be able to sustain into the future. Then discount those cash flows back to current value using a discount rate that pays you for the risk of owning a cyclical business – in this example, 15%. On this basis the current value of the

future cash flows is R211/share. That's the "intrinsic value" of the business.

What happens to that value if business conditions are tougher than originally expected? In table 2 the cash flows of the first three years are slashed by a collective 60% and, thereafter, revert to the same as in the previous example, implicitly assuming the earnings power of the company has suffered no long-term damage due to the economic dislocation. Interestingly, it turns out the value of the business has declined by only 5% to R198/share!

The value of an unleveraged business is a fairly stable number under most circumstances, as most of the value lies over a long period of more than 10 years in most cases. Current economic conditions have very little impact on that part of the valuation. However, the market's opinion of intrinsic value, as evidenced in the market price, is very unstable. Short term, the



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Anglo American	CFPS	1	2	3	4	5	6	7	8	9	10	11	perpetuity
annual cash flow	10,0	11,0	12,1	13,3	14,6	16,1	17,7	19,5	21,4	23,6	25,9	28,8	
Present value	10,0	9,57	9,15	8,75	8,37	8,01	7,66	7,33	7,01	6,70	6,41	123	
Assumptions		1st 10 years		89,0									
growth	10%	perpetuity		122,7									
discount rate	15%	Total value		211,6									

Source: RE-CM

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		1	2	3	4	5	6	7	8	9	10	perpetuity
Anglo American	CFPS											
annual cash flow	10,0	3,0	7,0	10,0	14,6	16,1	17,7	19,4	21,4	23,5	25,9	28,5
Present value	10,0	2,61	5,29	6,58	8,35	7,98	7,64	7,31	6,99	6,68	6,39	122
Assumptions		1st 10 years					75,8					
growth	10%	perpetuity					122,3					
discount rate	15%	Total value					198,1					

Source: RE:CM

## 11 market is highly inefficient.

In effect, value becomes nobody's baby – while price dominates. Price is easily obtainable (just open your daily paper to the list of stock market prices) and price provides an easily measurable benchmark with which to judge outcomes. On the other hand, value is much less visible, takes significant effort to calculate and – due to the number of assumptions that need to be made – isn't a precise number. It's no wonder the confusion between price and value is now so prevalent.

There are two solutions to this dilemma: indexing and value investing. Both are based on the principles that nobody can forecast the future and that the market is an efficient pricing mechanism over the long term. These solutions lie on the extreme ends of a broad continuum of processes available to investors.

Value investing is the only investment strategy that's documented to deliver returns exceeding those of the market over long periods. It's important to understand the process behind value investing and why it works.

A value investor spends most of his time determining a stream of cash flow a business generates over time. Therefore, the analyst needs to understand the economics of the company and the industry in which it operates, the competitive environment as well as the incentives that drive management of the business.

If the price of the stock is below that calculation of intrinsic value, the value investor buys the stock and patiently waits for the market price to eventually converge with the intrinsic value

of the company. Returns to value investors are thus uncertain over the short term and investment opportunities are usually coupled with powerful negative sentiment, as market prices only trade below intrinsic values when optimism is absent and the immediate outlook is poor.

Value investors train themselves to ignore the influence of daily price changes, as they convey no useful information. The only change that's of interest to the value investor is an impairment or enhancement in the intrinsic value of a company.

In a nutshell, the reason value investing – if applied consistently – works isn't because value investors are smarter than other investors, it's that the value investor earns excess returns for taking on the discomfort of other investors.

Indexing is the second solution to the problem. Index investors understand equity investors earn the equity risk premium over long periods. They've diversified away business-specific risk, and returns stem from investing in a risky asset class. The beauty of index investing is that you don't have to do any work: just put your money in the index, sit back and wait.

It's a cheap way to obtain exposure to the market, as it saves you twice: first, the cost of employing "helpers" and, second, the time and expertise you need to evaluate investment opportunities. These savings represent a significant competitive edge that, if applied consistently, will help these investors gain an advantage over most "active" investors. Too few investors utilise that very simple strategy, especially the "active"

institutional investors who operate in the broad middle ground between the two extremes of value and index investing.

That broad middle ground consists of a range of processes, generically termed "the easy way out". Unsurprisingly, it's in this space most institutions choose to operate. The basic modus operandi is to hire a very large team of analysts to forecast the market and invest based on that outlook for the market.

An illusion of certainty is created with such forecasts, bringing comfort to investors who confuse the market with a casino. The hook is that there will always be one or two of the helpers who get it right for a while. They are then sent out (in turn, helped by well educated and well dressed "business development managers") to collect money to manage from confused investors. Those investors will of course be prepared to pay the "helpers" handsomely, as comfort creates the willingness to pay high fees.

Of course, when those soothsayers' forecasting powers eventually fail them the company just fires them and hires new ones. That keeps its clients happy, as their manager maintains the illusion of control. The twin illusions of comfort and control are highly rewarded by naive institutional investors.

Of course, given the incentives involved, the "easy way out" process of investing dominates the money management world and ultimately results in the casino-like atmosphere of the stock market. The long-term returns of this approach are generally very poor, albeit interspersed with short periods of unbridled optimism.

Any attempt to forecast the future contains elements of uncertainty, but if you're using proven principles of fundamental valuation, the odds of being successful are far higher than when you're guessing about other people's guesses. Intrinsic value is a stable number; other people's guesses are a moving target. ■



**PERFORMANCE OF THE MEDIAN SMALL CAP UNIT TRUST VS JSE MID AND SMALL CAP INDEX**



13 the underweighting.

Over-exposure to stocks that are less liquid detract from performance. Part of the reason is managers get sucked into new listings, which tend to be smaller, less liquid counters. For example, in 2007 most of the new listings were on the FTSE/JSE AltX, which offers much lower tradability. Managers tend to underprice liquidity and this detracts materially from performance. It's an important issue, given the small-cap premium is partially a liquidity premium.

While liquidity on its own has no bearing on business fundamentals, small-cap managers are often forced to lock in their losses.

The bid-offer spread also tends to widen dramatically when risk aversion increases, driving down paper profits that small-cap managers accumulated in rising markets.

Other factors are underweightings in high dividend stocks and overexposure to stocks with greater financial leverage.

By far the largest detractor from performance was stock selection, which explains more than 80% of the underperformance.

**Many new industries:** The small-cap sector, including the recently added FTSE/JSE AltX market, is where many companies in new industries list. Analysing these companies is difficult and there

can be huge estimation errors, given the lack of track record and history and the high degree of uncertainty.

Additionally earnings of small-cap stocks are also more volatile and not as transparent as their larger counterparts.

**Initial public offerings (IPOs):**

The halo effect: In each of the two most recent listing booms (1998 and 2007) companies rushing to the market tended to be concentrated in the "hottest" industries. The average losses on all new listings in 2007 were 45% – far worse than the performance of the JSE small-cap index.

**Stocks that migrate in/out of the index and survivorship bias:**

Following the recent financial crisis, many companies on their way to zero (or delisting) pass through the JSE small-cap index first. So while the prospect of less efficient markets makes for ripe pickings in the small-cap environment it also comes at a much higher risk and hence higher probability of losses.

**Losses are hard to make up:**

Given that the biggest losses (ie, fatter negative tails) appear in the small-cap space relative to the overall market. Any manager exposed to these losses will find it very hard to make these returns up elsewhere.

**Uncertainty paradox:**

The less predictable an odd pricing effect, the less likely it can be arbitrated<sup>4</sup>. That doesn't presuppose markets are truly efficient and there's no small-cap premium, but rather that timing your entry and exit into small-caps is very hard to do. Of all the tools available tracking the number of IPOs is the best protection against a small-cap bear cycle. Sell when management sells (ie, list the company) and buy when management is buying (ie, delistings increase).

**In conclusion**

Any outperformance of small-

caps relative to large caps ultimately rewards investors for the higher costs and additional risk-taking, including a liquidity premium. This additional risk-taking relates to new industries, higher costs associated with poor liquidity, bankruptcy risk, the halo effect, uncertainty paradox and higher earnings volatility.

Small-cap stocks do provide meaningful diversification benefits in SA's equity market.

Managers generally outperform the small-cap index in bull markets but lose it again in bear markets, resulting in underperformance on a through-the-cycle basis. Much of that underperformance seems to be as a result of mispricing the risks involved.

Generating excess returns isn't only about maximising the upside potential but also managing the downside risk and avoiding losses. Small-cap managers would do well to focus on minimising the risk per unit of return.

In summary the best strategy for investors is to find managers with flexibility to invest where they see value and have the skills and resources to identify mispriced opportunities throughout the market spectrum. That way the investor doesn't need to worry about trying to time his investment in and out of small-caps.

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# Factor mimicry and dependence

**V**ALUE, SIZE and momentum are well-documented factors to indicate future performance. These have been shown to be successful on average over time on many markets, including our own<sup>1</sup>. “Smart” investors are beginning to use factor-specific products to glean profits in a more strategic way to serve their various investment goals. The challenge is in combining these investment strategies and factors in an optimal way. Whether through multi-management of various style-based products, multi-strategy investment or the use of a multi-factor model how do we combine what we know of the returns to value, small-cap, momentum efficiently and effectively? The answer: carefully and mindful of the changing nature of their relationships.

In particular, there are two snags investors must be aware of. First, some attributes that may be well documented for their estimation of factors that successfully earn superior profits can be a poor mimic of other factors. This can lead to a less focused investment in a particular style and, in the case of multiple strategy investment, can lead to unwitting and unnecessary overexposure.

For example, it’s not uncommon when designing a value investment strategy to assess the “value” of a stock by combining

several different value-indicating attributes. As such, the current price:earnings of a stock may be combined with its book to market value, intrinsic value, etc. Relative p:e is one of the many different value attributes: a company’s current p:e multiple as compared to its historic p:e multiple.

On the surface this makes sense as a value argument and there may even be international evidence to support the value of investment into such an attribute. However, in a country where the e (earnings) in the p:e changes much less frequently<sup>2</sup>, p:e relative is really more of a price:relative – which is, of course, just momentum in disguise.

The small-cap effect – also well supported by academic and empirical research as a worthwhile investment – presents similar ambiguities. When we use the capitalisation size of a company as an investment guide are we really investing in a small-cap premium or is smaller capitalisation rather a proxy for neglect (which is a value strategy), volatility<sup>3</sup> (which is a risk strategy), an illiquidity premium (a special return to investors to compensate for the liquidity risk) or simply the returns to any other strategy arriving late to the party<sup>4</sup>?

Furthermore, less liquid stocks (usually the smaller ones) introduce several estimation biases

into our frequent trading model design paradigm. Without correcting for thin trading, beta estimates for less traded stocks will most likely be underestimated<sup>5</sup>. Models that rely on these estimates to predict future profits (both CAPM and more complex factor models) will more likely underestimate the returns to less frequently traded stocks, resulting in (on average) a positive surprise in returns for those stocks. Thus the small-cap premium could – at least in part – be the result of estimation bias rather than a market phenomenon.

The second snag in combining investments in successful factors – of which hedge fund managers in the United States became only too aware in 2007 – is that the relationships between factors aren’t simple nor are they linear. Factors that offer good diversification and appear to be relatively independent of each other for the most part can exhibit strong “tail” dependence. That is, under more extreme conditions those apparently independent factors start behaving as if they’re close friends.

Graph 1 depicts the returns to two well-established factors in the US in 2007: notice the extreme swings in those premia leading up to the hedge fund crisis of 2007. Graph 2 shows the same information in two



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15 « dimensions in order to observe the relationship between those factors. For the most part, 2007 was business as usual and tried-and-tested factors such as momentum and value showed little correspondence in their behaviour (a nondescript cloud of points around the axis), offering investors good diversification opportunities among such strategies. However, in the extreme events leading up to the credit squeeze and large scale failure

of US hedge funds those factors exhibited extreme (“tail”) behaviour (marked in green and red) and, worse, appeared to suddenly move in synch: large positive and negative swings in the premia happened simultaneously.

The most commonly used quantitative methods to determine the relationship between two factors (or investments or investment styles) assume linearity of those relationships. Greater mathematical sophistication is required to uncover the changing and conditional nature of dependence between factors. One such approach is the use of copulas that allow for a greater understanding of dependence under changing conditions.

Shortly after the hedge fund crisis of 2007, Citigroup’s European report on quantitative focus<sup>6</sup>, estimated value and momentum – thought of as two fairly distinct factors – had a linear correlation of -0,09, which indicates a weak, bordering on inverse, relationship. By contrast, using a copula function they estimated a “tail dependence” of 0,16 between

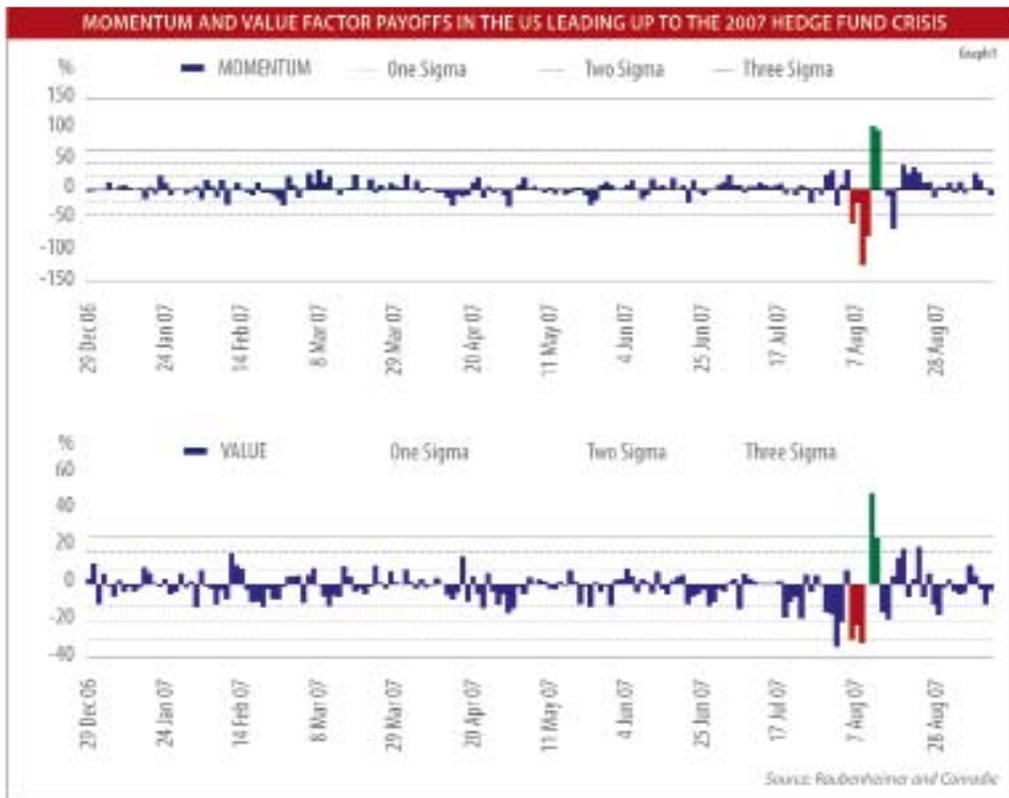
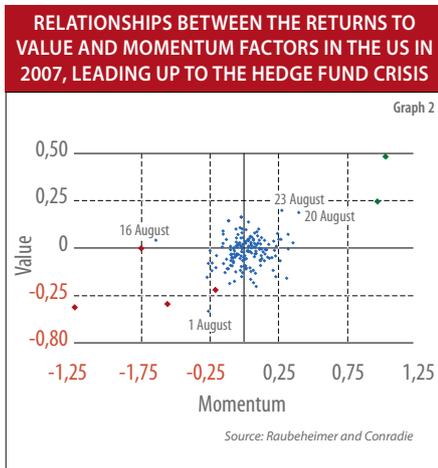
these factors that’s stronger and positive. Similarly, this report estimates a linear correlation of -0,30 between GARP and price momentum (ie, they exhibit strong inverse behaviour under general conditions) but a tail dependence of 0,12 (ie, they exhibit similar behaviour in the extremes) over the same period and investment universe. How are we to interpret this? Value and momentum, GARP and momentum generally represent complementary and distinct factor strategies. However, in extreme times these factor pairs tend to move together.

How are we then, as investors, to respond to the evidence for value, small-cap, momentum and other factor premia?

First, make sure you get what you pay for. If you’re buying a factor-based investment product that promises to take the best advantage of a particular factor premium make sure the product isn’t hiding other factors, particularly if you’re already exposed to those factors elsewhere.

Second, learn from the lessons of the hedge fund crisis of 2007. Aside from the credit squeeze and the obvious dangers of leverage, hedge fund managers and others following factor-based investment strategies learnt a hard lesson about “tail-dependence”. On the whole there are great risk benefits from diversifying among several different strategies but in “tail” times – times where risk management is most crucial – those strategies can become very alike: so don’t rely on the diversification benefits among strategies persisting.

It’s an appealing myth investment profits have distinct, unconditional and segregated sources. Since the revolutionary declaration of the CAPM to the present day we continue to acquire greater understanding and more successful estimation of the true premia in the market and their complex co-movements. We’re spurred on by the expectation that the truth, as they say, is out there. But the



truth takes many forms and seldom shows up alone...

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2. Earnings are typically only declared semi-annually on the JSE compared to US companies which declare their earnings quarterly.
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# Faking value and size

**IF A VALUE INDEX** gives a positive return over a long period of time, does that mean value stocks are worth buying or somehow special? If a size index gives a positive return over a long period does that mean small stocks have some sort of return advantage when compared to large stocks? We use a toy model to show a value and size effect can be faked in a simulated market of randomly generated stocks, which shows the conventional sales pitch for value and/or small cap premia is less than satisfying.

We look first at the simplest possible case: that of two stocks sorted on market value. That will give us crucial insight into the mechanism we're trying to understand. To investigate the model numerically we consider two arbitrary, uncorrelated stocks with normal returns such that their means and variances are identical. We then run exhaus-

sive Monte Carlo simulations. The stocks are named stock "A" and stock "B" (see table).

Two indices are created from those two stocks: a "large index" and a "small index" (hereafter without quotes). The stock that was ranked first by market capitalisation is always put into the large index and the second ranked stock represents the small index. Sorting takes place at the end of every investment period and stocks are reallocated to the indices accordingly. If there's a change in ranking we have a crossover between the two indices. This is demonstrated in the table.

A crossover attributes a loss to the large stock index and gain to the small stock index, creating a size effect.

This simplest case shows the size effect can be explained by data mining: by choosing a particular realisation where a small

index outperforms a large index. It also shows that with sufficiently many realisations and sufficiently many crossovers a small size effect emerges.

A more general many-stock implementation yields a more significant outperformance by the small portfolio<sup>1</sup>. These experiments bear out a claim analytically verified by Fernholz and Karatzas (2006). In particular, the small index always captures the positive returns in the market when there's a crossover. Through subsequent rebalancing that accumulates to generate the size effect. So what we learn is it's the crossover mechanism that generates a size like effect.

Nevertheless, tweaking variables in the numerical models yields further insights. We extend the crossover mechanism to account for a value effect. In such a model there are two sources of crossovers: those associated with the book values and those associated with the market values.

Our next toy market contains 40 stocks, 300 investment periods in each simulation of the market and 5 000 simulated markets. Each reporting period is 25 increments apart<sup>2</sup>. Each stock in each market has two processes: a market value process and a book value process. The market value processes are zero mean

Time	Large Stock Index				Small Stock Index			
	Name	Price	Return	Index	Name	Price	Return	Index
First Day, Month #1	Stock "A"	100		100	Stock "B"	50		100
Last Day, Month #1	Stock "A"	70	-30%	70	Stock "B"	80	60%	160
First Day, Month #2	Stock "B"	80		70	Stock "A"	70		160
Last Day, Month #2	Stock "B"	60	-25%	53	Stock "A"	80	14%	183

"Crossover" (indicated by arrows between the two indices at the transition from Month #1 to Month #2)

Source: Gebbie and Wilcox

» log-normal random processes with constant variances and uncorrelated with each other. The book value processes are periodic jump processes with random jump sizes. The periodic jump dates are randomly chosen but fixed for each stock in each simulated market – proxy financial year ends to give a periodic randomly reported book value. Towards the objective of constructing independent risk factors for value and size, the Fama and French model (1993; FF model) first entails the assembly of six portfolios, as follows: the collections of small cap and large cap stocks are further sorted into low, medium and high book-to-market subsets. To correct potential size effects in a value factor the high minus low (HML) factor is constructed as the average of the two high value port-

folios minus the average return of the two low value portfolios. Similarly, to correct for possible value effects in a size factor, the small minus big (SMB) factor is obtained as the average return on the three small-cap portfolios minus the average return on the three big cap portfolios. We apply that construction to our toy market.

The three key features of these graphs are as follows: feature number one is that the value factor is positively correlated with the number of crossovers arising during book-to-market sorts and, similarly, the size factor is positively correlated with the number of crossovers arising from the market value sorts. That's consistent with the argument that crossovers generate the return structure of our value and size factors. Feature num-

ber two shows the size factors have average returns greater than the market portfolio. This is consistent with the argument that the return premia associated with value and size factors are positive relative to the market portfolio.

This isn't consistent with the argument that the investor is compensated for additional risk attributed to smaller companies, nor that smaller companies have special properties that make them better investments: in our simulated market all stocks have the same on average return of zero. That isn't consistent with the argument those stocks with higher book-to-market values have some additional risk or special properties that make them a better investment. In this toy model they have totally random book values that have no



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19 fundamental meaning.

« Feature number three is that the value factor has average positive returns that are greater than the size factor returns. This is consistent with the observation there are more crossovers in its construction and that a slowly varying random variable when combined with a quickly varying random variable generates more crossovers.

What have we learnt? Our toy model has phenomenology that's remarkably similar to that seen in real financial markets. The size effect remains an open question in finance, particularly since out-performance is typically a function of the window of historic data investigated. Simple simulations such as ours offer an alternative to

more elaborate but inconsistent economic interpretations. Modelling random components in stock returns and periodic updates of reported book values we examined the value effect. Our illustration shows simple uncertainty can detract from the alleged value proposition of value investors. This gives further weight to the school of thought that suggests value investing can be achieved as successfully via cheaper low-tech fundamental indexation [4].

Our market phenomenology appears to be a direct artefact of choosing how we want to sort stocks in the presence of uncertainty and has nothing to do with actual attributes at a stock level. Nor does it appear to stem from data mining. The question

then remains: To what extent can incidences of superior returns in constructed small cap or value portfolios be misleading real fund managers, real investors and trustees and are associated fees a reflection of skill or chance?

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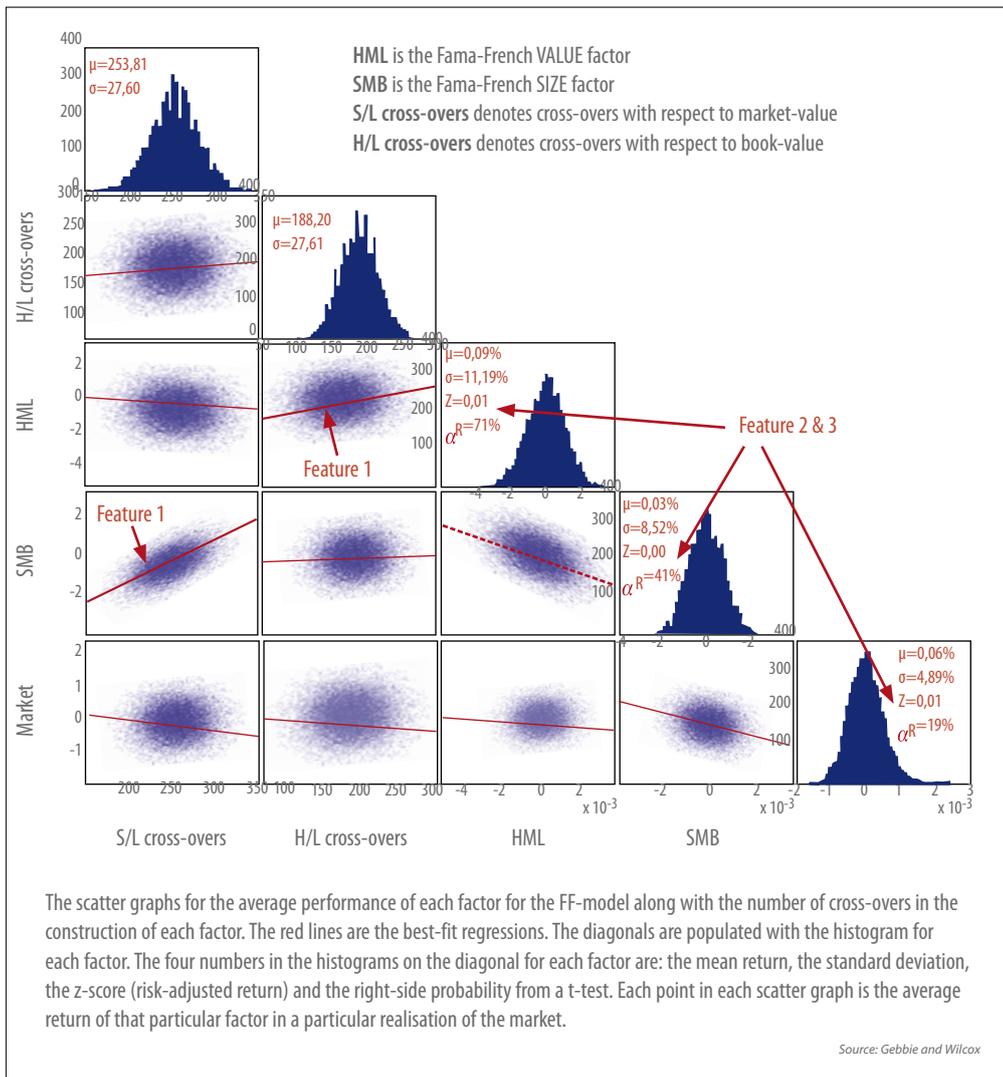
1. In a real market there may be some mean-reversion, which could generate more cross-over events than in the log-normal price model. It may be possible to treat the log-normal price model as a lower bound for the effect.
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The scatter graphs for the average performance of each factor for the FF-model along with the number of cross-overs in the construction of each factor. The red lines are the best-fit regressions. The diagonals are populated with the histogram for each factor. The four numbers in the histograms on the diagonal for each factor are: the mean return, the standard deviation, the z-score (risk-adjusted return) and the right-side probability from a t-test. Each point in each scatter graph is the average return of that particular factor in a particular realisation of the market.

# EMH: Myth, myth-busted or myth-understood?

A finance joke often used to describe the efficient market hypothesis (EMH): two finance professors are walking down the street. One sees a R200 note lying on the pavement and shows it to the other, who says: "That can't be a R200 note or someone would have already picked it up." And so they continue walking...

**T**HERE'S BEEN much debate in investment circles regarding the "efficiency" of financial markets. Do classical inefficiencies – such as the value, momentum and small-cap premiums – actually exist and can fund managers systematically exploit those inefficiencies? The EMH states market prices reflect all available public information and adjust immediately to incorporate any new information. That's based on the notion investors are rational beings making decisions in an optimal manner in order to maximise profit, while important current information is almost freely available to all. Consequently, EMH proponents frequently declare passive indexing to be optimal, as active management shouldn't be able to consistently add value over time (after costs).

However, behavioural economists have shown investment decisions by humans are typically not rational. Studies have shown behavioural biases – such as overconfidence, overreaction,

loss aversion, herding and regret – all imply investors don't always make rational decisions. Behavioural economists suggest that irrational behaviour is unlikely to yield efficient financial markets.

In the SA setting, research by Cadiz Securities has shown momentum in stock prices and short-term mean reversion strategies can yield positive returns even after accounting for costs. The SA stock market also offers a confounding feature in the form of a high resources sector weighting. SA fund managers typically counter this by having a lower weighting of resources shares in their portfolios (whether that behaviour is rational or irrational is debatable).

So, when resources shares outperform, SA active funds tend to underperform the market, and vice versa. Thus the question of whether or not the SA stock market is efficient – and therefore whether active management or passive indexing is optimal – is largely a question of the relative performance of resources shares

and less a question of the fund manager's skill.

Supporters of the EMH have responded to the arguments by behavioural scientists by contending that while behavioural biases do exist, their existence is fleeting and their relevance minimal, due to the market forces that will arbitrage away such opportunities. However, this statement relies on the assumption market forces are sufficiently strong to overcome these behavioural biases. While it's difficult to prove or disprove this statement, we can take cognisance of a quote by the great economist John Maynard Keynes: "The market can stay irrational longer than you can stay solvent."

So how do we reconcile the apparent behavioural biases of investors with the theory of EMH? This paradox has been tackled from a cognitive neuroscience perspective by Professor Andrew Lo. In his 2004 paper he coined the phrase the "Adaptive market hypothesis"



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21 « (AMH) and suggested the market is a dynamic one driven by competition, natural selection and the diversity of individual and human behaviour. This evolutionary perspective suggests humans are adaptive and develop “rules of thumb” via trial and error and natural selection. They learn through positive or negative feedback and only the strongest (or most prosperous) and most innovative survive.

However, if there’s no feedback then the investors create heuristic rules that suit their current environment (eg, value-based investing will work in a value-driven market regime). If the market regime remains stable then the rules may work (and perpetuate themselves in the case of financial bubbles). However, if market conditions change (which can occur suddenly in the case of market crashes) then these rules may be viewed as behavioural biases that result in sub-optimal behaviour in the new environment (eg, using simple value-based strategies could result in investing in “value traps”). Lo suggests that behaviour may not necessarily be irrational but may rather be “maladaptive” to the new environment.

The profit opportunities in a market could be likened to the amount of natural resources in a particular ecology. The more abundant the resources, the lower the competition (in

finance terms, the market is less efficient). However, as competition grows, resources (ie, profits) diminish (rendering the market more efficient) and ultimately reducing the population. Under AMH, convergence to equilibrium is never guaranteed. Determinants of such convergence are due to the profits (natural resources) and the market participants and their interaction, which are always evolving.

Although the concept of AMH is still in its infancy, the following list is a sample of its implications as proposed by Lo:

- The risk-reward relationship changes over time and is varied throughout. This relationship is shaped in an evolutionary manner based on past experience: eg, youngsters in the population (or

momentum) also change over time but don’t necessarily disappear forever (as indicated by the EMH): eg, many researchers point to the fact the “small-cap effect” – or the outperformance of small-cap shares over large-cap shares – has diminished over time. However, as the graph shows, the outperformance of small caps over large caps has varied over time.

- Innovation is the key to survival. While the EMH posits investors should earn more return simply by bearing more risk, the AMH implies the risk-reward relationship varies over time. Therefore, as environments change investors who are quickest to adapt will be the ones to reap the most consistent rewards.

### Innovation is the key to survival

new investors) who have recently been burned by the trauma of the credit crunch may demand a higher premium for bearing risk, while more experienced investors may demand a lower premium, in accordance with long-term performance.

- Opportunities will appear from time to time in different time scales. However, as more participants enter the market, competition increases and opportunities are exploited and disappear. However, new opportunities are also created as species (investors) die out, as others are born and as institutions and business cycles change. Markets don’t tend towards higher efficiency but rather have cycles, trends, exponential growth (or bubbles) and other ecological phenomena that characterise the lifespan of an ecological system. Consequently, the returns derived from the various investment styles (eg, value, growth and

Will the AMH eventually surpass the EMH as a cornerstone of modern finance theory? Only time will tell whether the compelling theoretical arguments provided by Lo can be supported by empirical evidence. However, the AMH does help to bridge the gap between behavioural finance and EMH. Under the AMH the so-called “inefficiencies” – such as the value, momentum and small cap premiums – can actually exist and the prevalence of those effects will fluctuate due to the interaction of the population of the complex ecosystem that is the financial markets.

#### Sources

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12 MONTH ROLLING RELATIVE RETURN OF THE SMALL CAP INDEX (J202T) OVER THE LARGE CAP INDEX (J200T): 1996-2009

