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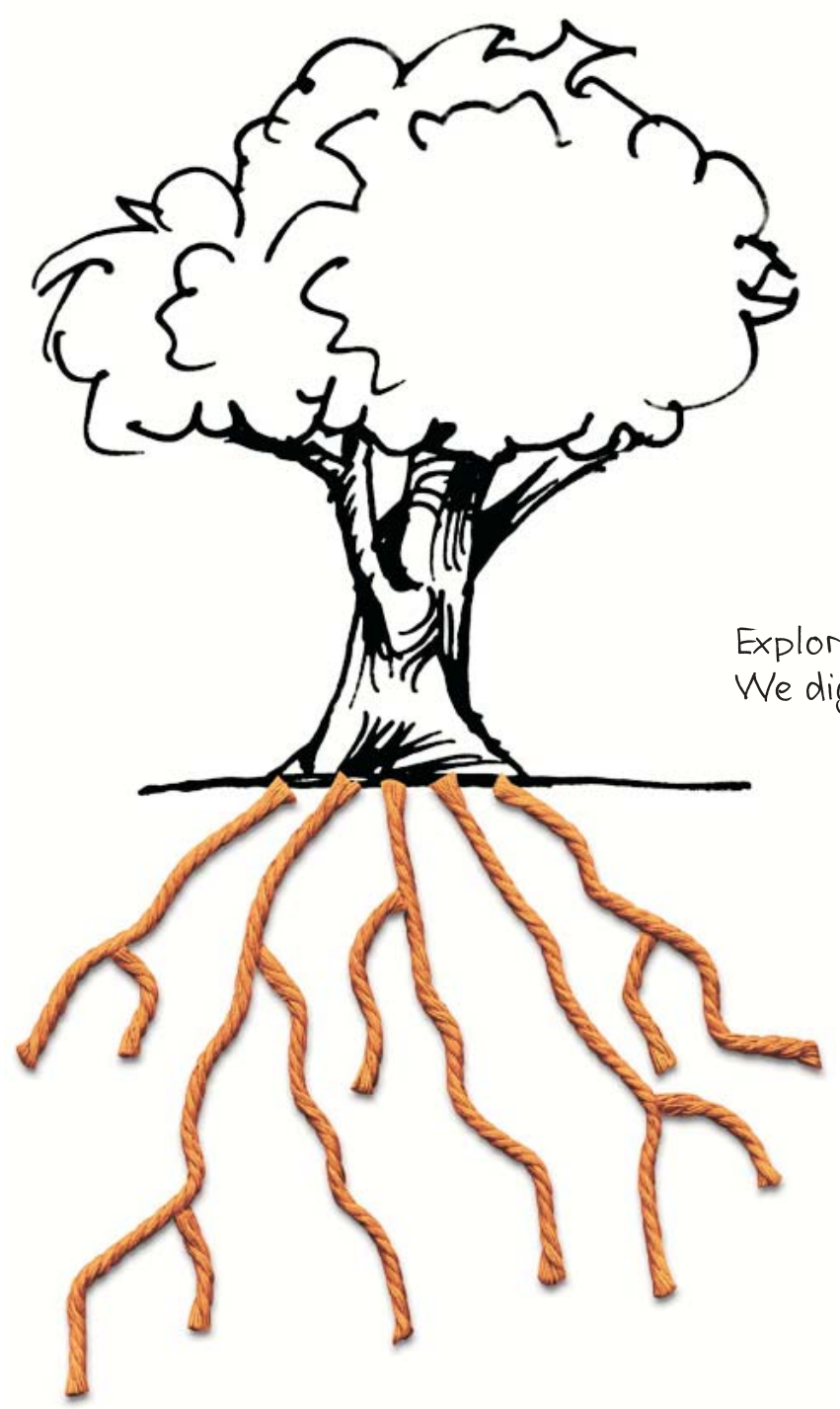
risk and investment
consulting



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We dig deeper.

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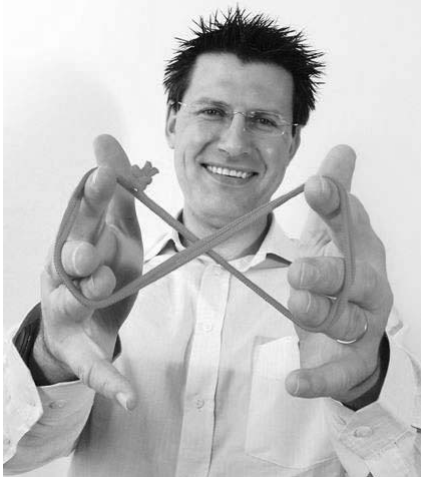

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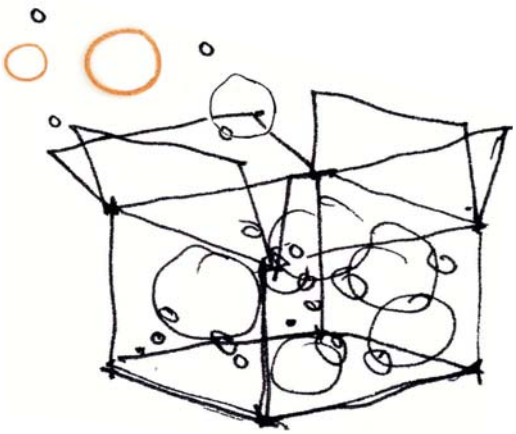


The tale of stochastic modeling

Born glamorous and useless but now emerging as the royal tool of financial advice

by Dr Petri Greeff, Research and Special Projects

In a recent Personal Finance article (What Your Chances Are, Personal Finance, 2nd Quarter 2008), Bruce Cameron lifted the lid on the stochastic modeling techniques and explained how this seemingly complex method can be successfully used to help financial planners and consultants provide proper investment advice to their clients.

The biggest advantage of stochastic modeling is that the advice can now be measured against a range of possible outcomes, allowing the client to recognise the implications of choosing a particular investment strategy in terms of its risk and reward.

GLAMOROUS ROOTS

Although the term stochastic modeling sounds high tech and exciting, the method actually had a much more descriptive name for the past 80 years in the field of physics – the Monte Carlo method. The name literally refers to the gambling tables of Monaco's city of Monte Carlo where fortunes are made and lost on the random roll of the dice or spinning of the roulette wheel.

NOT ALL THAT USEFUL BUT TECHNOLOGY LIT THE WAY

For decades the Monte Carlo method had very limited applications, even within physics, the field from which it came. This was due to the lack of computational power of even the supercomputers of bygone eras. Luckily technology has changed and this has greatly assisted the Monte Carlo method (or stochastic modeling) to find its way into other areas like finance where it's used in many areas of financial modeling.

RISCURA AS PIONEER

About 4 years ago when we began developing our own asset liability model, RisCura aggressively introduced Monte Carlo methods to various client products and services. For us the benefits of using stochastic modeling in our ALM was clear:

Q + A with Petri

South Africa allows me to: celebrate the power of being positive.

I eat: mostly vegetarian – thanks to my wife's dislike of meat and my bad cooking skills.

2008 is the year of: opportunities - whichever way you choose to see it.

I think life is about: being true to yourself, passionate about what you do and leaving the world in a better state than you found it.

Coffee makes me: happy. Especially if it's freshly roasted and home brewed.

it allowed us to perform complex decrement estimations, like mortality, ill-health, withdrawal, marriage and birth rates amongst others, without necessarily using intricate actuarial mathematics. It also allowed us to develop an asset model that makes use of proper risk statistics for optimal portfolio construction.

But all this really doesn't help a lot in explaining why the Monte Carlo is so powerful and why it should be a non-negotiable component when asset consultants or financial advisers prepare investment strategies for their clients.

A GAME OF CHANCE

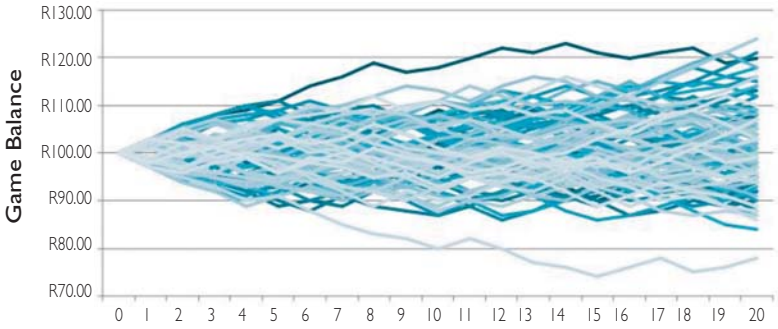
To help illustrate this, let's use the following example in honour of the method's glamorous roots. In a game of chance, the successive roll of a dice determines the eventual pay-off from an initial amount that the "investor" bets. Each pip on the dice is associated with either a gain or loss of the balance of the original amount.

For example, let's say that each pip is associated with the following gains and losses for each R100 betted:

No. of pips	Gain/Loss
1	+R1
2	+R2
3	+R3
4	-R1
5	-R2
6	-R3

It's well known that each pip on the dice has an equal chance of landing face up when the dice is rolled. For example, the "investor" bets R100, rolls the dice the first time which lands face-up on 3 pips, therefore the R100 now gets increased by R3 to R103. When he rolls the dice for the second time, it lands face-up on 5 pips, therefore the R103 gets decreased by R2 to R101. Eventually, rolling the dice 20 times in succession, the balance of the original amount is now say R110, i.e. a profit of R10. Based on this positive outcome, the "investor" now bets another R100 rand in a second game. However, this time his balance at the end of the game is R94, i.e. a loss of R6. Say he plays the game a 100 times in total, the unique path and outcome of each outcome is shown below:

Rolling the dice



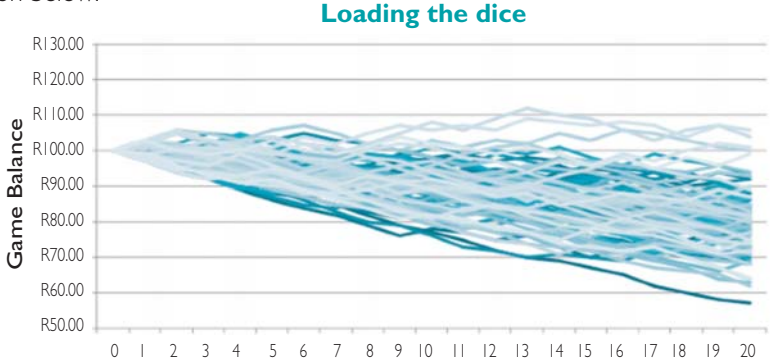
So how did he fare in these 100 games plotted out above? Statistics tells us he won 51 of them with an average balance of R100.81. Now if this game was to be repeated an enormous number of times to test all possible winning and losing balances, there would have been 50 wins, 50 losses and an average balance of R100.

So "on average" the investor has a 50/50 probability of making a profit or loss in this game and the reason for this was because the decisive parameter – the dice – was such that both positive and negative outcomes had an equal chance when the dice was rolled.

LOADING THE OUTCOME

But what if the dice was loaded such that some numbers appeared more often than others? Say that 3 faces of the dice (e.g. the ones with 4, 5 and 6 pips) in general appeared face up three times as many as the others. What would happen now if the investor again betted R100 on this game? The outcome of a 100 games played using the exact same rules, apart from the loaded dice, is shown in the graph below:-

Loading the dice



Suddenly the chances of winning are looking a lot slimmer. Out of the 100 games above, he would only win 4 with his average balance at R79.39. Even though this dice rolling example seems trivial, it has very important parallels with modeling a single financial asset and even ultimately a portfolio of them over time.

MODELING PROBABILITIES FOR INVESTMENTS

The characteristics of the dice can be equated to the characteristics of the asset class, i.e. when taking note of which pips appear face up how many times, a probability distribution can be determined that will tell us which pips are the most likely to appear if the dice were to be rolled again. In turn, this allows us to model the outcome of our game. This is also what happens when the historic returns of asset classes are analysed to determine their probability distribution. Knowing this also allows us to make an educated guess on the range of outcomes when we use these asset classes in our modeling process (i.e. what is the most likely outcome over time if we invest a sum of money into it now)?

STATISTICAL SIMILARITIES, DIFFERENT GOALS

It is however important to realise that the similarity between the dice rolling game and the movement of an asset is fundamentally only a statistical one that relates to their probability distributions.

In general, any game of chance is associated with a negative outcome, whilst investing is generally associated with a positive outcome, i.e. the long term growth of an investment. But just as a dice can either be precise or loaded, different asset classes also have different probability distributions with some more likely to give less than expected returns than above expected returns over the long term.

PROTECTS OUR CLIENTS

So just as the dice roller got a surprising outcome in the game with the loaded dice, an investor may be surprised when certain asset classes underperform a benchmark, if the expectation was that they would outperform. This is why it's important for us at RisCura to understand the risks associated with all asset classes in our modeling process to help make sure our clients aren't faced with any nasty surprises.

Whose Money is it Anyway?

Some of Rob Rusconi's key thoughts about the industry, trustees and asset consultants.

By now you would have probably heard of Rob Rusconi's mammoth 2008 report – Whose Money is it Anyway? which focuses on the relationship between a retirement fund and its service providers. It's quite a read, but valuable, simple and relevant. An essential thought stimulator for anyone who is responsible for overseeing and managing money.

Access the document on **www.robrusconi.com**

ROB RUSCONI ASKS 10 CORE QUESTIONS:-

1 **Active vs Index Linked alternatives**	Why is there such a strong emphasis on active asset management as opposed to index-linked?
2 **Trustee training**	Is training provided to trustees independent and in the best interest of the trustees or does it deepen their dependence on their service providers?
3 **Asset consultants**	Are consultants effectively bridging the gap between the needs of members and the mandates of asset managers?
4 **Fee models**	Are fee models designed to align the interests of provider and customer?
5 **Hedge funds**	Is the diversification opportunity of investing in hedge funds worth its costs?
6 **Marketing**	Do marketing activities enhance customer understanding or are they designed merely to attract a customer to a service without adding significant value?
7 **Performance surveys**	Do performance surveys of asset managers provide a useful service and are they used responsibly?
8 **Trading dynamics**	Are all asset managers executing all trades in the best interest of their customers?
9 **Socially responsible investing**	Is enough attention given to the fundamental principles underlying a socially responsible investment approach?
10 **Multi-managers**	Are the complex products, fee structures and operations of multi-managers being properly evaluated by trustees?

Below we cover some of Rusconi's introductory thoughts about the industry and then in more detail, look at his question relating to the asset consultants.

RETIREMENT FUNDS ARE IMPORTANT:

- Largest single group of investors in the country with assets of well over R1000 bn. A large and powerful investing force that represents a significant part of the national economy.
- Probably its greatest power is to invest for economic growth. This is positive but has its flip side risks – "Improved regulatory measures are needed to avert possible destabilising effects of large pension fund operations on financial markets."
- Represents a wide range of investors including the full spectrum of employed and reaching far into the lives of low income South Africans.
- Looked after by concerned individuals who are elected as trustees and often don't have the required investment expertise.
- It's a fragmented industry (in 2005 – 13,390 registered funds with 57% having 20 members or less and 71% having 50 members or less). Why is this a problem? Small funds are usually under resourced in terms of experts available to run the fund and in these cases, too much power can be given to service providers.
- Serviced by complex chain of service providers who may not always operate in the best interest of the funds or their beneficiaries.

TRUSTEES ARE IMPORTANT:

- Trustees have enormous power over the financial interests of their members and their actions are therefore subject to fiduciary responsibility. This means making decisions that:-
  - Are in the interests of all members of the fund;
  - Don't favour some members over others;
  - Make use of appropriate knowledge.
- Trustees should not necessarily take on an operational role but rather the role of a director, asking important questions such as :-
  - Is our process of selecting service providers rigorous and sound?
  - Are our service providers acting in the best interests of fund members?
  - Are the fees paid to service providers appropriate?
  - Are we as trustees applying our minds to decisions or are we too dependent on service providers?

ASSET CONSULTANTS – INDEPENDENT INTELLECTUALS?

Asset consultants play a crucial role in bridging the gap between the fund members' needs and the mandates of asset managers. Rusconi's question is – have asset consultants fulfilled this responsibility widely enough and do conflicts of interest affect their advice to trustees? Below, we summarise his thoughts on this question.

Because of the move from Defined Benefit (DB) schemes to Defined Contribution (DC) schemes, there has been a massive transfer of risk from institutions (companies) to individuals. This has taken place without stronger regulation and proper consumer support. Members, who are least able to manage these risks, are not being adequ-ately assisted to understand or cope with this risk.

Consultants are the "intellectual lamp bearer of risk management expertise" - and their primary focus should be on the bearers of risk – the members of defined contribution funds.

THE QUESTIONS OF BENCHMARKS

Because DC fund members bear the risk and benefits associated with a fund's assets – it's important that these assets are soundly invested and the investment returns correctly measured. Success is determined by specifying appropriate targets/benchmarks and then measuring the extent to which managers beat the benchmarks.

- Benchmarks specified in manager mandates must work together to contribute to the overall objectives of the fund's members.
- Benchmarks must take into account the parameters most relevant to a member. Members are likely to be satisfied in retirement if they have the means to continue the standard of living to which they have become accustomed in their working life.
- The most important driver of investment returns gained on savings put away during our working years is salary growth – as our income grows, so should the value of our retirement savings.
- Benchmarks should therefore be linked to salary growth and since salaries are linked to economic growth, benchmarks should also be linked to economic growth.

- Benchmarks should be long term in nature. Short term goals are inconsistent with members' needs.
- Popular equity benchmarks used over the last 20 years such as JSE All Share, 80/20's, CAPI's, half weighted resources and SWIX's are not the most obvious benchmarks likely to match salary growth over the long term.

Consultant's role:

1. Understand the rationale for a fund's benchmarks and combine them in a way that is best suited to the needs of the fund and its members.

THE IMPORTANCE OF LIABILITY-DRIVEN INVESTING

- Asset allocation is key to the fund and its members – this is the most difficult and important problem facing trustees.
- Building the bridge between the asset and liability side requires ongoing research to develop a coherent framework.

Consultant's role:

1. Expressing liability-driven objectives that are sensitive to the needs of members in the language of asset managers.
2. Demonstrate to the trustees how the manager is being measured and how this translates into value for the member.

SOME PROBLEMS WITH THE CONSULTING MODEL

Ownership above service – some consultants strive to become indispensable to the client. Most businesses want long, strong relationships with clients but if this compromises the integrity of the offering, it's problematic. Rusconi questions whether a consultant who is filtering, managing and controlling information that goes to trustees may mean the consultant has too much power and the trustees are not taking enough responsibility.

Cross selling ethos – investment consultants that are part of a larger organisation selling other products and services to retirement funds can blur the line of an "independent service" to trustees

Inappropriate incentives cast doubt on the independence of consulting firms:-

- Transition management, a lucrative service, has the potential to affect the integrity of the portfolio construction advice offered by the consultant.
- Implemented consulting can compromise "best choice" manager recommendations if the administration platform that the consultant makes use of does not include/support a particular manager.

THE ISSUE OF FEES

Are fees paid to the consultant, compared to other service providers in the retirement community, an equitable reflection of where the accountability for the final outcome should lie?

- It's difficult for consulting companies to make money from consulting alone which means for many consulting companies, diversification of their business is the key to survival.
- Consultants must be held just as accountable for the fund's performance as the asset managers.
- The method of paying asset managers based on the size of assets under management has no logical underpin and may result in fees that are inequitable for efforts put in or results delivered.

WHAT CAN BE DONE?

Rusconi believes Trustees must insist that:

1. **Consultants are independent** of product providers and free of any potential conflicts of interest.
2. **Consultants are appropriately remunerated** and paid a fee in line with other professionals, at a level that reflects their skill.
3. **Consultants are chosen to match the tasks** required – trustees should establish a short list of providers and then choose one for each task that requires special skills and independence.
4. **Alternative consultants are invited on a rotating basis** to broaden the range of thought to which trustees must apply their minds. This need not be expensive – a short list of providers and occasional meetings might be all that is required.
5. **Consultants explain their chosen approach** from the range of approaches available.

The above is a summary of Rusconi's thoughts on the industry, trustees and asset consultants from his paper **Whose Money is It Anyway?** and do not necessarily represent the views of RisCura. We will however, in our next issue of thinktank, provide some of our thoughts and views on this question and others.

Profile | Fikile Shabangu

Client Manager
B Com Hons (Financial Management); Currently completing Masters

My role at RisCura is to: service clients to the best of my ability and of course to represent the RisCura brand!

I love working at RisCura because: it's challenging and there is always something new to learn everyday.

I am very good at: persevering. I am disciplined and follow my gut.

In the mornings, I love to: wake up to "morning live" on TV.

My family means: everything to me. They are my pillar of strength and the people who love me unconditionally.

I deal with challenges by: going to gym: if I am doing katabox, I pretend I am punching the problem and if I am spinning, I pretend I am racing against the problem. . . . . and obviously I win! Gym clears my thoughts.

The people at RisCura are: hardworking, smart and talented.

I'm at my best when: I am relaxed or when I have achieved something like a goal or task.

RisCura
good thinking

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