May 2015

Rate of Return: Time Weighted vs. Dollar Weighted
Book Review: Trilogy on Progress

Very few things in investing are as tricky to make sense of as the rate of return on a portfolio. It should be simple: take the change in value, divide it by the opening value, and you have the return.

Not so simple. For starters, you can have two portfolios, invested in exactly the same thing, over exactly the same time, yet one shows a gain and one shows a loss. How is this possible?

There are two ways to calculate a rate of return: dollar-weighted and time-weighted. Dollar-weighted returns consider the effect of cash deposited into or withdrawn from the account, whereas time weighted does not.

The two methods give different results depending on when the investor added cash or withdrew from the portfolio. The difference arises because markets - and investment managers - produce returns unevenly through a period, so it matters when you invested your dollars.

Which method you prefer depends on whether you are the client or the investment manager.

Investment managers want time weighted returns because they are interested in how they are doing without the distortions caused by money that clients added to or withdrew from the portfolio. This allows them to compare their performance to peers or other benchmarks, without these distortions.

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Chris provides financial planning, investment planning and full implementation services to about 100 families.

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Investors, on the other hand, are interested in the returns on their actual dollars invested.

Here's an example:

Say you have a portfolio that goes up 10% in the first half of the year, and down 5% in the second half. If you had $100 in that portfolio, you would have about $105 at the end of the year; giving you a time weighted return of about 5%. Simple so far.

Now imagine you added $200 to the same portfolio halfway through the year. Your initial $100 would go up 10% in the first half, but the 5% decline in the second half would be on the larger amount invested, i.e. the full $300. The gain of $10 in the first half would be more than offset by the decline of $15 in the second half. You would have a total decline – in dollars - of about $5.

The portfolio manager would show a return of +5%, same as before (independent of the dollars invested). You, on the other hand, having invested a total of $300, would have only $295 – a loss of $5 or -2%.

Time Weight

		6 mo +10%		6 mo -5%		Full Year
$100 for 1 year	$100	+10% = ($10)	$110	-5% = ($5)	$105	Gain $5 = +5%

Dollar Weight

		6 mo +10%		6 mo -5%		
$100 for 6 months	$100	+10% = ($10)	$110			
Add $200			+$200			
Total			$310	-5% = ($15)	$295	Loss $5 = -2%

The point is that your actual return is influenced by the timing of when you added money and when you took it out. Same investment, different return.

It gets interesting because as experienced advisors know, people tend to add tons of money to an investment that has already done well, and they take it away from investments that seem to have done poorly (after the horse has left the barn). Since investment returns are cyclical, this means that people tend to pour money into something that has done well, just in time for it to do poorly.

This behaviour creates a significant disconnect between the manager's (time weighted) return and the investor's (dollar weighted) return. It is why Peter Lynch, long-time top-performing manager of the Fidelity Magellan Fund[1], famously said that Fidelity's own analysis showed that 'The average investor in Fidelity Magellan has lost money'. John Bogle, founder of Vanguard Investments, found that the typical investor underperforms the funds he owns by 2.7% per year[2].

People find it incredible that investors can lose money investing in a top-performing asset. Yet it happens all the time. Maybe more discussion around the time-weight vs. dollar weight methods will help illustrate the folly of chasing performance.

It is unfortunate that much of the financial industry, and certainly the media, conspire against the investor by bleating about recent performance, and encouraging investors to buy whatever has gone up in the last block of time, thereby contributing to the investors' destructive pro-cyclical behavior. A good advisor, who understands the key to success is patient countercyclical behavior, has to swim against this tide. More on this shortly.

And yes, Chris Horan's Emotional Counterweight strategy is to have patience with a great manager that is experiencing a rough patch of poor performance; it's the 'Buy Low' part.

Problem with Dollar Weighting

The problem with the investor's dollar-weighted return is it is a unique number, specific only to you. The uniqueness arises because your start date, contributions and withdrawals are all unique to you. This means you cannot compare your return to any other number.

In the example above, the portfolio manager would show a return of about 5%, but your statements would show a loss of about 2%. You would have no idea whether you should fire your manager or admit your timing was bad luck.

The solution is to analyze your returns in depth. Four stars in a website ranking system don't do the trick. Moreover, the analysis is beyond the capability of anyone except an experienced and honest person with detailed knowledge of markets, investments, and returns. The messages are nuanced, complex, and often counterintuitive.

Understanding investment returns is fiendishly difficult. Incorrect inferences based on misunderstanding of performance lead to Big Mistakes - probably the most important single reason that most investors fail miserably (see Peter Lynch above).

To learn how to assess performance, turn the page.

[1] Lynch steered Magellan to top performance over more than 10 years in the 1990s. It became the world's largest fund at over US$100 billion as investors poured money into it. It has not done so well since.
[2] JC Bogle, 'What is ahead for stocks and bonds', Las Vegas Nevada, May 15, 2006

Analytic Framework
Manager Performance – Time Weighted

The analytic framework has two parts. First is to assess the manager's performance against peers, market benchmarks, and what is happening out there in the world. These comparisons use the manager's time weighted returns, as is standard in the industry.

If your manager seems to be 'underperforming', you then analyze the portfolio holdings to identify the reasons for the performance (called attribution analysis). The tricky part is deciding if the reasons for the underperformance are acceptable. This is where it gets interesting.

Counterinuitively, sometimes you actually want an 'underperforming' manager. The classic here is 1999, when the 4th quartile (i.e. worst) performing managers, like Danny Bubis of Tetrem[3], looked like idiots because they had no tech stocks. Value managers' performance subsequently leapt upwards in March of 2000 as the tech stocks crashed and value stocks did well.

Value style managers – 4th quartile - were the only ones to survive the 80% collapse of the tech and growth stocks in 2000-03. If you weren't 4th quartile in 99 you didn't make it to 03. It makes a difference: Danny's 15 year return today is double the TSX[4] (and yes, clients have been with Danny the whole time).

In September 2012 the laggards were (again) value managers such as David Slater of Cundill, holding a ton of dirt-cheap US bank stocks that were slowly getting off the ground; the banks subsequently doubled as the US housing market began to normalize. The recovery in bank stocks propelled those value managers to 44%+ returns in 2013 (and yes, clients were there).

Another counterintuitive point is that almost all managers with great 10-year records have 3 or 4 or more (!) years in the basement - 3rd and 4th quartile. So you should fully expect your manager to look like a bum from time to time. (See 'Excellent Manager Project' March 2004, www.chrishoran.ca.)

In fact, an old industry saw is to find a manager with a great long-term record who is currently in the basement – 4th quartile is best. Derisive articles about 'yesterday's man' are perfect. Take out a mortgage on your house and give the manager all the money, because he's about to shoot the lights out with a blockbuster run. Horan's corollary is, 'Smart managers don't suddenly become stupid'.

Conversely, when a manager seems to be doing well, did she have a lot of leveraged small stocks that were very risky? Did she do well by avoiding a decline in a sector such as energy in 2014?

Whether you want to give the manager more money or take it away depends on the answers to these and many other questions. As I said, complex and nuanced. A neophyte has no hope.

3 Managing United Canadian Equity Value Fund at the time
4 United Canadian Equity Value, 15 year compounded return, Feb 2015: 12% vs. TSX: 6%

Client Performance – Dollar Weighted

The second part of the analysis, and the reason you want your own unique dollar-weighted return, is to follow your personal progress against the longer term goals in your personal Financial Plan. (If you don't have a Plan, fire your advisor and call me).

Over time, you will see your progress as your portfolio increases in value vs. your net invested capital. This long term growth reinforces your confidence, and you become less sensitive – even impervious - to short term market fluctuations. This insulation from the stresses of market declines is a huge factor in my clients' long term success (I have clients who have been with me over 20 years).

In years where you've had a negative return, (we all did in 2009) how does it compare to the downside risk identified in your plan? More importantly, did your advisor allow you to lock in the loss by selling in 2009? (If so, fire him.)

To summarize, proper assessment of portfolio performance requires both time-weighted returns to analyze the individual managers, and a unique dollar-weighted return to track your progress toward your goals. But remember, you can't compare your unique portfolio return to any other return.

Trilogy on the Knowledge Economy

Three books form a trilogy on our modern economy.

Our democratic, free enterprise, world seems to have progressed along a science-based path from the Dark Ages to jet travel and iPhones, multiplying our standard of living by more than 300 fold just since the Industrial Revolution. The path seems natural, almost inevitable, in retrospect.

The reality is much more interesting.

The Bourgeois Virtues, Deidre McCloskey

Deirdre McCloskey is Distinguished Professor of Economics, History, English and Communication at the University of Illinois at Chicago. The Bourgeois Virtues is a powerful survey of the economic reality and ethics that have brought such great wealth to our modern world: better living for more people than ever in human history.

McCloskey takes on the critics of capitalism and crushes them with evidence. It is serious, yet written with a sense of humour (her choice of the word 'bourgeois' is a poke at the sneering envy of the Marxists – since the word properly means 'educated, middle class urban dweller', we are all bourgeois).

Her main point is that free enterprise supports and encourages the virtues, (Faith, Hope, Love, Prudence, Justice, Courage and Temperance) and so supports the liberal democracy of the capitalist countries, led by 16th century Holland and England.

The baker, for instance, takes great courage, faith, and hope to set up the business, honesty and prudence to bake good things that people want to buy, and yes, even love makes it easier to deal with difficult customers, and so grow the business.

McCloskey notes that transgressions against the virtues are not unique to capitalism any more than any other type of organization: fraud, greed, envy, and even murder are well-represented in every walk of life: government, academia, and even the religions. Inequality was much worse in all other forms of government, especially and ironically, the communists (where citizens were either deprived, starved or shot).

The book is a wonderfully refreshing barrage of counterpoints to the seemingly endless negativity surrounding capitalism these days. Who would have thought that business was virtuous?!

The Gifts of Athena, Joel Mokyr

The Gifts of Athena is much more than the story of how the Industrial Revolution has evolved into our modern Knowledge Economy.

Mokyr shows how the great leaps of the early Industrial Revolution were not illuminated by scientific discovery, but sprung instead from tinkerers such as Watt and Bessemer experimenting with pistons and molten metal to spawn the great inventions such as steam engines and steel.

The men behind the great leaps had almost no scientific understanding of what they were doing. Edison's light bulb resulted from thousands of experiments with hot filaments, and the Wright brothers' airplane from experiments with kites and gliders. The science came afterwards, as research explained what happened.

Mokyr shows that knowledge, once discovered, may then, under the right conditions, disperse through a population. Knowledge may become useful if society is motivated to experiment and free to move forward into the unknown. But there are many impediments to progress.

Today we look back, and are tricked into thinking it was a path from a kite to a biplane with a motor, to a multiengine plane, to jet engines, and so on to the supersonic Concorde. But knowledge, Mokyr shows, doesn't progress like that.

The book is full of fascinating stories of how conservative forces, from both the political right and the left, stood firmly in the way of progress. Most of us are familiar with the Luddite protests against new weaving machines, but Mokyr also describes how the English wool manufacturers strongly resisted the development of the cotton industry. For 20 years cotton underwear was illegal in England.

Hard to believe today that someone would have stood in the way of cotton underwear.

These vested interests against progress – from the political left and right - prey on our instinctive aversion to change and our fear of the unknown. Reactionary forces form a resistance barrier to progress that technological creativity must struggle through before it can take root and become accepted.

The thing I love about well-told history like this is that it brings the present alive. The stories help provide historical context to today's widely held – but unfounded - aversion to genetically modified foods, despite the fact that there is not one example of harm from GM crops. Or fracking.

One of the many important lessons of the book is the debt we owe the English and Dutch Parliaments, which had the courage, dare I say ideology, to stand against these conservative forces and encourage progress for progress sake. Makes our current Parliaments, unable to balance budgets, seem so helpless.

Yet our Parliament, being elected by us, is just a reflection of us. Makes you think …

The Structure of Scientific Revolutions, Thomas S Kuhn, University of Chicago, 1970.

The Structure of Scientific Revolutions is one of the 100 most influential books of all time, according to Science, having sold over 1 million copies in 16 languages.

Ian Hacking, writing the introduction to the 50th anniversary edition in Science magazine, tells us 'Great books are rare. This is one. Read it and you will see'. I agree.

Kuhn describes how science seems to progress in a smooth line, but this is only because science is written by the victors. The reality is anything but smooth. New scientific paradigms such as the Copernican Revolution are not obvious at first and must fight to become accepted. The battle is often long and savage.

Once a scientific paradigm becomes accepted, the old one is destroyed, because it isn't taught any more. The battles fought by the new paradigm to gain acceptance are forgotten.

The Copernican Revolution, for instance, took planet Earth from the centre of the universe where it had been since the Dark Ages, to orbit the sun instead. Seems so obvious now, but it took 200 years to be accepted. The idea faced fierce resistance from the church, one of the most powerful forces on Earth. The church was so committed to the idea of Earth at the centre of the universe that it threatened to burn Galileo at the stake.

The initial suggestions of a new paradigm often raise more questions than they answer. For instance, Copernican astronomy required the universe to be much larger than previously thought, since the planets had to revolve around the sun. Skeptics asked how the sun could produce enough heat to warm the Earth over the tremendous distances implied by heliocentric orbits. The Sun would be too far away for any known heat source to work.

Science at that time was unable to explain solar power. It was only after hundreds of years of raging debate – and threatened executions - that the discovery of nuclear energy was able to answer the question.

Scientists are just as insular and egocentric, emotional and prone to holding onto their own views as any of us. Scientists are part of communities or tribes that hold similar views. Status is conveyed through published research, especially through mutual citations of each others' papers.

These affinity-linked groups can produce incredibly powerful resistance to competitive ideas. The vaunted peer review process is tainted by the competitive, envious, or even oppositional views of the peers that the journal assigns to review a paper. Conversely, sympathetic reviewers can elevate scientific garbage into the mainstream by overlooking lapses or faults in a paper.

One financial planning point: my copy, dated 1970, was \$5.95; as reviewed in the December 2012 Science, \$45. Now that's inflation! (4.6% per year.)