A CLOSE LOOK AT VALUATION METHODS

by John Price

Is a share of Woolworths worth $42.00 … or … $10.12 … or … $188.45? Actually all of these are mathematically correct according to standard valuation methods and tables used by professional analysts through to DIY investors. Of course, even though they are mathematically correct, the results are no use for anyone considering buying or selling shares in Woolworths. How are these contradictory valuation results possible? They arise because of three fundamental weaknesses with the standard intrinsic value methods.

The first weakness is that there are actually dozens of methods that purport to calculate the intrinsic value of a stock providing a bewildering range of outcomes. In some cases one method will show a stock is highly undervalued, others that seem just as reasonable will show that it is completely overvalued.

On top of this variation between the methods, the second weakness is that most of the methods show even more variation within their calculations. Changes of a few percentage points in the inputs give results that differ by two or three hundred percent. A common outcome is that investors and analysts unwittingly manipulate the results to support their prior opinions. While appearing to be objective, the outcome is really highly subjective.

The third weakness with the standard value formulas is that they do not have a time component. Even if we could know that a stock is 50 percent undervalued, there is a world of difference between the price moving to the intrinsic value within a year or as long as a decade. In the first case it would be a wonderful investment, in the second probably not much more than a bank rate.

Finally, all these weaknesses are made worse by what I call mathematical intimidation. This is the use of opaque mathematics, computer programs or tables (which are often quoted second-hand to begin with) without understanding the assumptions and logic behind them.

Fortunately, none of this is necessary for sensible, rational investing. In fact, in this article I will show how a careful analysis of one intrinsic value method brings us back to what we could have been doing all along, finding companies with confident growth in earnings trading at prices that will lead them to be Wealth Winners®.

Over the past 15 years I have personally programmed, examined, tested and compared every valuation method that I could find. In my recent book The Conscious Investor (Wiley, 2011) I closely examine and describe the most well-known of these methods.

The methods range from balance sheet methods (particularly those developed by Benjamin Graham), to discounted cash flow methods (where the outcome is usually referred to as intrinsic value), to dividend discount methods (while still an intrinsic value method, includes many variations such as return on equity, residual income valuation, and abnormal earnings growth), payback methods (that estimate the time for dividends to pay back the price of the share), and expected return methods (that estimate the expected average return of an investment). I also look at various filtering methods such as magic formula investing by Joel Greenblatt, CANSLIM by William O'Neil and factor models by Robert Haugen.

In each case I look at their assumptions followed by their strengths and weaknesses. Some of the assumptions are fairly innocent and open such as working with the entries in the balance sheet. Others require making forecasts over shortish time periods. But the most problematic assumptions require making forecasts for an infinite number of years.

As an example consider the dividend discount method. It asserts that the true or intrinsic value is the sum of the discounted values of the dividends over the entire life of the company which is assumed to be infinite.

To hide this impossible task of forecasting dividends out to infinity, the method is often recast in terms of return on equity and the payout ratio. It also assumes the clean surplus relationship which asserts that book value (equity per share) at the end of a period is equal to the book value at the start plus earnings less dividends paid.

The simplest variation assumes that ROE and the payout ratio remain constant. Next, if you know the initial book value, it is easy to calculate the earnings and dividends for the first year. Now use the clean surplus relationship to calculate the book value at the end the year. Repeating this process allows you to calculate the dividends out to infinity. Finally discount these dividends and add them up using the mathematical theory of infinite series to get the intrinsic value.

Consider Woolworths. Over the past ten years its ROE has been as low as 24.5 percent and as high as 36.5 percent. Its average has been 28.6 percent. We will use this as our input into the formula. (There is a difference when calculating ROE whether you use the equity at the start of the period, the end of the period, or an average of the two. For simplicity in the calculations we will suppose that the equity we are assuming is at the start of each financial year.)

Similarly over the past ten years the dividend payout ratio has ranged from 65 percent to 70 percent with an average of 68 percent. We will assume that it is going to be 68 percent in the future.

At the end of the 2010 financial year the book value of Woolworths was $6.15. It is a simple matter to bundle together the preceding financials to calculate the earnings and dividends of Woolworths running out into the future. As a start, since the book value is $6.15 and ROE is 28.6 percent, then the earnings per share during the first year must be 28.6 percent of $6.15 which is $1.76. Taking the payout ratio as 68 percent means that the dividends must be 68 percent of $1.76 or $1.20.

The next step is to apply the clean surplus relationship to calculate the book value at the end of the first year. In this case, the required book value is $6.15 + $1.76 - $1.20 or $6.71. Now repeat this step for year 2 and so on.

One more thing. We need to include a discount rate. Basically this is the rate that we would like to earn to compensate for the risks associated with investing in Woolworths. Assume that it is 12 percent.

The table below shows the results when we do this for 10 years. I have also included years 20 and 50. People who use these methods actually implement mathematical formulas, or use tables calculated from these formulas, which calculate the result for an infinite number of years. In this case, the result is $42.00. This means that if we kept doing the calculations year after year, eventually the sum of the discounted dividends would converge to $42.00.

Notice in the table that earnings, dividends and book value are all growing at the rate of 9.15 percent per year. This is a consequence of the initial assumptions on ROE and the payout ratio.

Year	Book Value at Start of Year	Earnings per Share	Dividends per Share	Book Value at End of Year	Discounted Dividends	Running Total
1	$6.15	$1.76	$1.20	$6.71	$1.07	$1.07
2	$6.71	$1.92	$1.31	$7.33	$1.04	$2.11
3	$7.33	$2.10	$1.42	$8.00	$1.01	$3.12
4	$8.00	$2.29	$1.56	$8.73	$0.99	$4.11
5	$8.73	$2.50	$1.70	$9.53	$0.96	$5.07
6	$9.53	$2.73	$1.85	$10.40	$0.94	$6.01
7	$10.40	$2.97	$2.02	$11.35	$0.91	$6.93
8	$11.35	$3.25	$2.21	$12.39	$0.89	$7.82
9	$12.39	$3.54	$2.41	$13.53	$0.87	$8.69
10	$13.53	$3.87	$2.63	$14.76	$0.85	$9.54
...	...	...	...	...	...	...
20	$32.47	$9.29	$6.31	$35.44	$0.65	$16.91
...	...	...	...	...	...	...
50		$128.47	$87.36	$490.30	$0.30	$30.41

Table 1: Return on Equity Valuation

Often the year by year convergence to the final value is painfully slow. For example, after 10 years the result is $9.54, giving a huge error of 77 percent compared to the true value of $42.00. After 20 years the table value is $16.91, giving a sizeable error of 60 percent. Even after 50 years the table gives $30.41, so the error is still approximately 28 percent. What this shows is that the accuracy of the ROE formula for intrinsic value relies on forecasts decades, and even centuries, into the future.

Unfortunately it gets worse. Suppose you are worried about the impact of Coles, IGA and Aldi on the future ROE of Woolworths. You think that for the next 5 years the ROE will be 20 percent and after that it will be 15 percent. These are still excellent levels way above the great majority of companies on the ASX. But even with these reasonable changes, the intrinsic value drops to $10.12.

But wait. You have looked at Woolworths' increasing number of acquisitions into hotels and casinos. You reckon that the ROE will be maintained but the board will slightly lower the payout ratio to 60 percent to free up more money for further acquisitions. Now the intrinsic value jumps to $188.45.

In other words, with fairly small changes in the assumptions that go into the ROE method the intrinsic value can swing from a low of $10.12 to a high of almost $190. We really have no idea whether Woolworths is undervalued or overvalued, whether we should buy, sell, or do nothing.

Where does price fit in?

Another confusion concerns the insistence by some that it is essential to calculate intrinsic value before everything else. While the theory of intrinsic value methods may be interesting to an academic, even if we could calculate (or approximate) intrinsic value, on its own it is useless to an investor. It needs to be compared to price to make a decision whether the stock is undervalued enough to buy or overvalued enough to sell.

But since price is involved in the final decision, it makes no logical difference whether it is included at the end or included as part of the calculations right from the start. In fact, often more insight is gained by bringing price into the calculations right at the start.

Even more surprising is the fact any decisions using the ROE method implicitly hinge on opinions whether the P/E ratio is high or low.

Consider the earlier calculations for Woolworths. Suppose that you accept that the intrinsic value is $42.00 and that you believe that a bargain price for Woolworths is a 50 percent discount or $21.00. Since the earnings are growing by 9.15 percent per year, they must have been $1.61 for the previous year. (In fact they were $1.63.) This gives a P/E ratio of 13.0. In other words, all these assumptions and calculations regarding Woolworths are a roundabout way of coming to a conclusion that we could have arrived at right at the outset, namely that Woolworths is a buying opportunity if earnings grow by at least 9 percent per year, dividends are around 68 percent of earnings, and the P/E ratio is less than 13.

So instead of having a method that we believe avoids such things as price, P/E ratios and dividend yields, in reality the use of formulas or tables has simply obscured their use.

What to do?

Applying mathematical formulas to valuation methods can be fun, but not if it leads to overconfidence and misleading results. The problem is that hidden inside the calculations are absurd assumptions and impractical requirements. Unsuspectingly we have been led astray by mathematical intimidation. I have been through it all: Writing high level code for the hedging operations of international companies through to designing new foreign exchange option strategies.

But the more I see, the simpler I want any method I use. Warren Buffett, the legendary investor, chairman and CEO of Berkshire Hathaway, wrote in 1997:

"Your goal as an investor should simply be to purchase, at a rational price, a part interest in an easily-understandable business whose earnings are virtually certain to be materially higher five, ten and twenty years from now."

This seems like a good starting point: find companies with virtually certain significant growth in their earnings. Buffett explains the result of finding such companies:

"Put together a portfolio of companies whose aggregate earnings march upward over the years, and so also will the portfolio's market value."

Finally he tells us this is what he does:

"Though it's seldom recognized, this is the exact approach that has produced gains for Berkshire shareholders."

It's hard to get anything clearer than this. To see how it works in practice, consider UGL and Downer EDI, two companies that have had business dealings with the newly listed QR National. The table shows that over the past ten years, the earnings and price of Downer EDI have both grown by approximately the same amount, around 11 percent per year. Similarly, the earnings and price of UGL have also grown by approximately the same amount, approximately 24 percent per year. This reinforces Buffett's injunction to seek out companies that will grow their earnings because that will drive the price.

		10 Years Ago	Today	Growth Ratio	Growth Per Year
Downer EDI	EPS	$0.23	$0.59	2.59	11.16%
	Price	$1.90	$4.84	2.55	10.95%
UGL	EPS	$0.13	$0.87	6.77	23.67%
	Price	$2.00	$14.63	7.32	24.75%

Let's add one more requirement for earnings. It is important not to pay too much for them. If we can be confident about the future growth of earnings and we do not pay too much for these earnings, we are going to do well. If we can top this up with a healthy stream of dividends, all the better.

Confidence in the growth of earnings comes from a proper analysis of areas such as debt, the stability of earnings and sales growth, and the company's economic moat. It also comes from understanding the risks of the business and knowing that management is honest, rational and acting in the best interests of shareholders. Determining if a company meets these requirements is a core focus of Teaminvest. The second component, knowing what constitutes a reasonable price to pay for the earnings comes from applying six strict rules explained in The Conscious Investor.

Finally, no discussion of finding real value in the share market would be complete without talking about of margins of safety. Before making any investment decision we need to stress test or apply practical margins of safety to assumptions or forecasts we make in three areas: future business performance, market opinion and board dividend policy. Even better, as discussed in my book, is to do this in an automated way to remove any prejudicial biases. Putting these steps together is the best way that I know to achieve consistent Wealth Winners®.

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