How To Calculate Intrinsic Value

In this crazy world where no price is too high, it is time to talk about intrinsic value.

Knowing what the intrinsic value is of something you are thinking of investing in, is key to differentiate risky investments or bets, from investments that will lead you to your financial goals with the highest degree of certainty.

For me, the goal of investing is to reach my financial goals for sure. For example, if there is a 10% chance, I don't hit my retirement goal, that is not acceptable. 10% chance of disaster is gambling, not investing. Others might be getting richer faster on whatever investments that go up fast, but they might also lose everything when the tide turns. Once you lose big, the power of compounding is gone and you have to start over. You can kiss your financial goals goodbye.

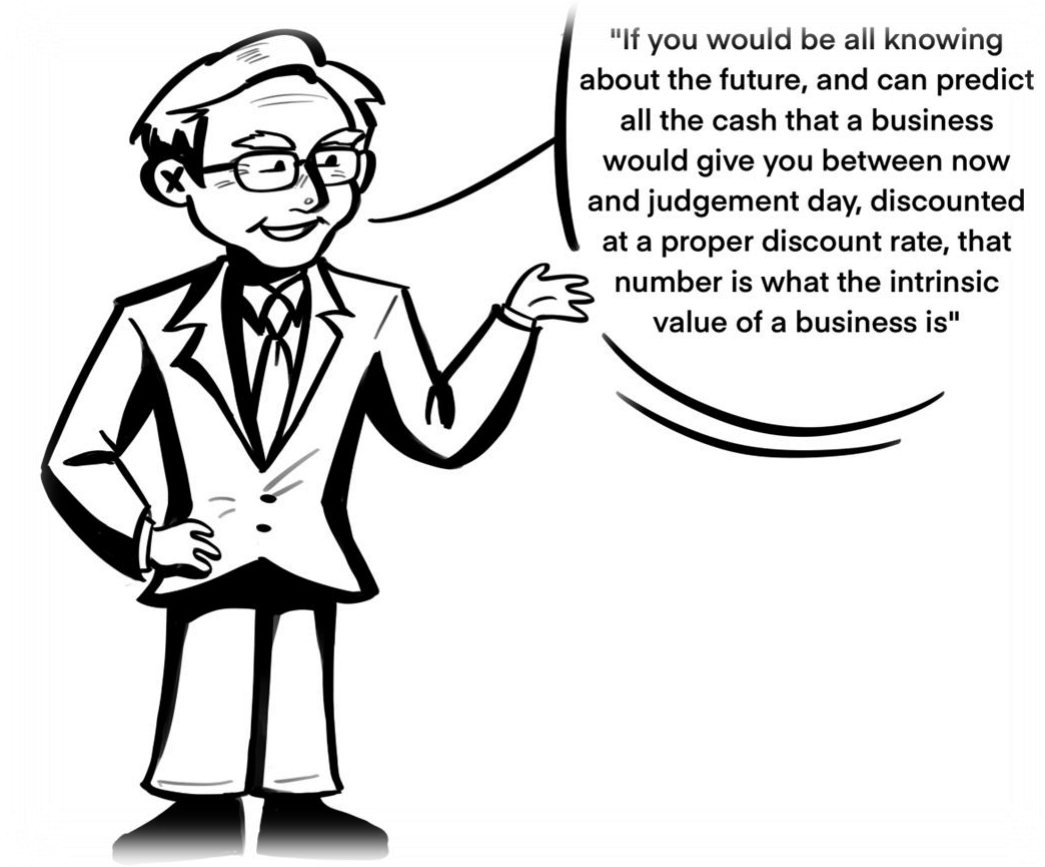
Value investing is about finding investments with the lowest possible risk, and when there is low risk, the only thing left is reward. Compound reward over a long period of time, and you are sure to do well - as would Buffett say: "getting rich slowly" but surely, I would add.

To find investments that will lead you to your financial goals no matter what happens in the next decade, the key is to know how to estimate the intrinsic value of an asset, compare the intrinsic value to the price and see if it leads you closer to your long-term goals.

Table of Contents

What is intrinsic value?

Buffett defines intrinsic value in the following way:



In short: " Discounted present value of future cash".

Of course, nobody is all knowing about the future. My crystal ball broke last month when my kid was playing with it. However, the key word above is cash.

The value of an investment, whatever investment, is represented by present value of the cash it will deliver to you in the future, or could potentially deliver, discounted at a proper discount rate.

The intrinsic value formula looks like this:

$$\text{Intrinsic Value Formula} = \frac{FV_0}{[1+i]^0} + \frac{FV_1}{[1+i]^1} + \frac{FV_2}{[1+i]^2} + \ldots + \frac{FV_n}{[1+i]^n}$$

Figure 1 - Intrinsic value formula

We sum the present value of the future values and get to the intrinsic value. Looks relatively easy but here comes the fun part:

- we need to know the future, or at least estimate

- we need to use a proper discount rate

Let's start with estimating future cash flows.

Estimating future cash flows

It's easy with bonds, you know when the coupons are coming and when you'll get your money back at the moment the bond matures.

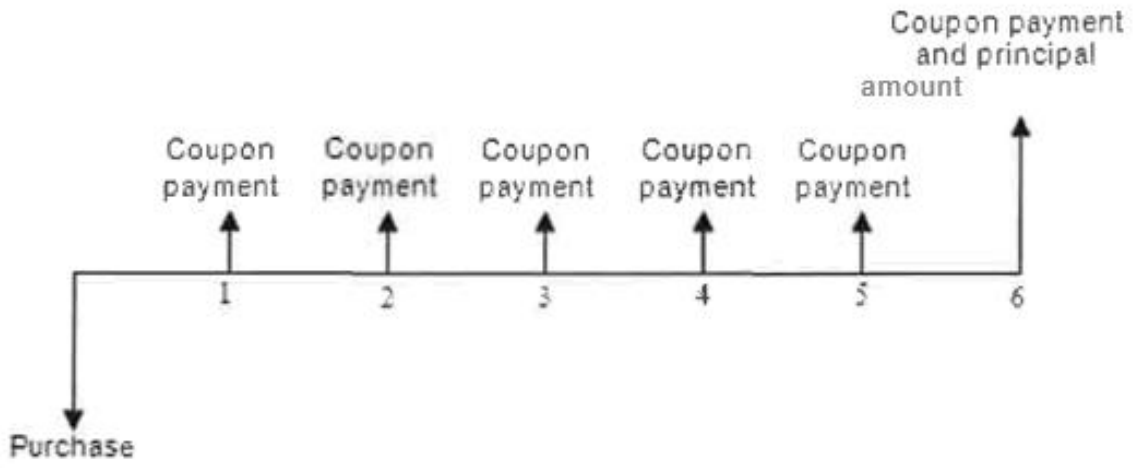


Figure 2 - cash flows related to bond

With stocks things get a bit more complicated, even if it can be complicated with bonds too, if the issuer enters into financial problems.

Complications related to stocks include dividends, growth, cycles, market panics, exuberant moments, business issues and many other things that constantly flood headlines. In such a crazy environment it is key to put the effort in to find the intrinsic value in order to eliminate the noise surrounding investments. If you can do that, you are already ahead of most people.

The easiest way is to look at dividends and to apply a terminal value to a stock in let's say 10 years when you can sell it. You don't need to sell it, but it is a good exercise to think about selling for the intrinsic value calculation, to get all the possible cash out. 10 years is usually enough for a market cycle or two. To make things easier, I have created the following template.

Intrinsic Value Calculation Template

The intrinsic value calculation template can be downloaded on my Value Investing Course (free). Download it and follow the steps for easier apprehension.

NAME	LINK TO RESEARCH													
STOCK PRICE					DIVIDEND PAYOUT RATIO	1								
												Terminal Value	Growth rate	
COMPARATIVE TABLE'!A1														
Scenario 1	input, per share or market c	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2034	8%	next 5 years
normal case	0,90	0,97	1,05	1,13	1,22	1,32	1,43	1,54	1,67	1,80	1,94	26,99	8%	5 to 10 years
	PV(10%)	0,88	0,87	0,85	0,84	0,82	0,81	0,79	0,78	0,76	0,75	10,40	10%	Discount rate
	INTRINSIC VALUE	18,55											15,0	Terminal multiple
												Terminal Value	Growth rate	
Scenario 2	input, per share or market c	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2034	10%	next 5 years
best case	0,90	0,99	1,09	1,20	1,32	1,45	1,59	1,75	1,93	2,12	2,33	63,66	10%	5 to 10 years
0	PV(10%)	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	24,55	10%	Discount rate
	Present value sum	33,55											30,0	Terminal multiple
												Terminal Value	Growth rate	
Scenario 3	input, per share or market c	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2034	4%	next 5 years
worst case	0,90	0,94	0,97	1,01	1,05	1,09	1,14	1,18	1,23	1,28	1,33	12,81	4%	5 to 10 years
MARGIN OF	PV(10%)	0,85	0,80	0,76	0,72	0,68	0,64	0,61	0,57	0,54	0,51	4,94	10%	Discount rate
SAFETY	Present value sum	11,64											10,0	Terminal multiple

Scenario	Probability	PV	Part
Scenario 1 (normal case)	60%	18,55	11,13
Scenario 2 (best case)	20%	33,55	6,71
Scenario 3 (worst case)	20%	11,64	2,33
STOCK PRICE NOW	0	Sum	20,17

SVEN CARLIN

RESEARCH PLATFORM

Disclaimer: This is just for educational purposes and not for investing advice!

MADE BY STOCK MARKET RESEARCH PLATFORM

Figure 3 Intrinsic value template by Sven Carlin

The intrinsic value template has the following moving factors:

- Scenarios 1, 2, 3
- Value creation (cash)
- Growth rate
- Discount rate
- Terminal value
- Value to me (dividends)
- Comparison

Let's discuss them one by one and then you will be able to calculate the intrinsic value for your opportunities. I'll use Apple as an example for the description so we can immediately apply things.

Inputs:

VALUE CREATION (cash) + GROWTH

The input can be in per share values when you compare the intrinsic value to the share price or in absolute values when you compare to the market capitalization. For example, in the case of Apple, you can use $93 billion in net income to compare to the market capitalization, or you can use per share values of $6.61. Given that Apple makes a lot of buybacks, it is better to use the per share value. (buybacks lower the amount of shares outstanding, and thus even with flat net income, net income per share grows)

When it comes to what to use as the input, let me simplyfy things. At the end, whatever you use, the intrinsic value should be the same because the input should represent the best description of how the company can deliver value to you as a shareholder.

The best factor is the owner's earnings which are defined at the cash flows that can be distributed to owners after the business has paid all the expenses and capital expenditures for investments.

As all businesses are different, one has to think of how much value the business has created in that year for a shareholder. The best measurement is to check the change in book value plus the dividend. But then again, all businesses are different and things have to be adjusted related to the business.

With Apple, the net income for fiscal year 2024 was $93.7 billion. When cash flows from operations are calculated, the accounting adds another $11.6 billion that went for stock based compensation and we get to cash from operations of $118.2 billion. Deducting capital expenditure of $9.4 billion gives us $108.8 billion in what could be called owner's earnings.

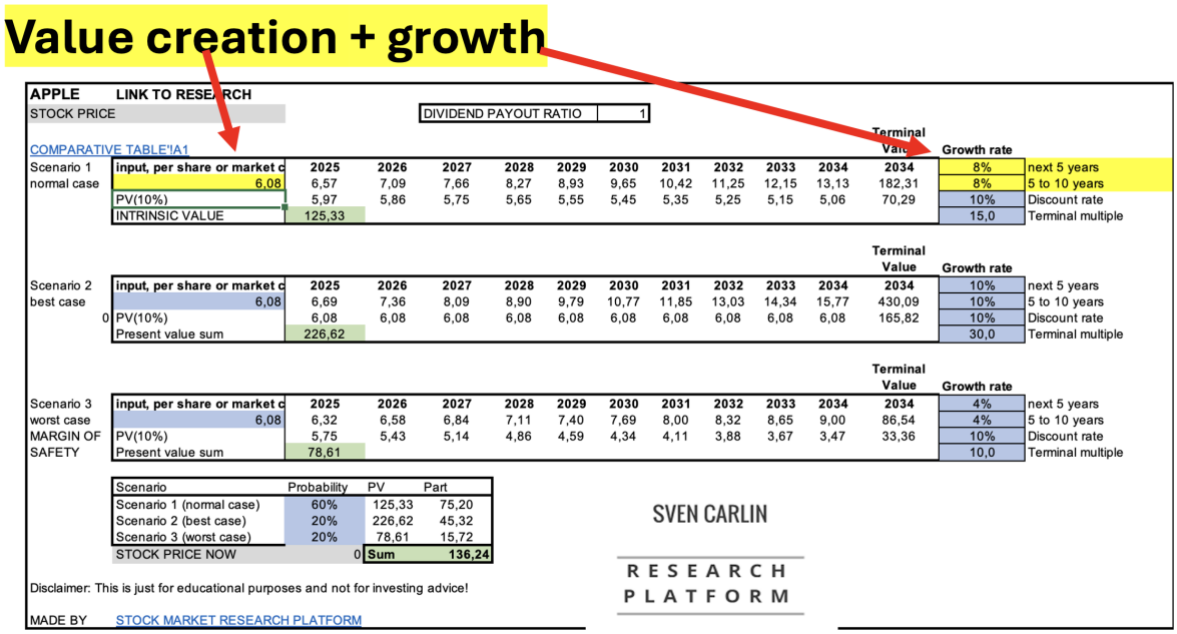
However, from a value perspective, the stock based compensation of $11.6 billion is also a cost, Apple does buybacks to cover for those issued stocks, and therefore I would also deduct that from the value creation. Thus, the value created is then $96.6 billion.

The $96.6 billion is close to net income, which is a good representation of Apple's value creation per year, and therefore using net income for Apple is not a bad idea. The fact that it is lower also adds to being conservative when it comes to estimations.

Cash Flow Statement | TIKR.com	24/09/16	30/09/17	29/09/18	28/09/19	26/09/20	25/09/21	24/09/22	30/09/23	28/09/24	LTM
Net Income	**45,687.00**	**48,351.00**	**59,531.00**	**55,256.00**	**57,411.00**	**94,680.00**	**99,803.00**	**96,995.00**	**93,736.00**	**93,736.00**
Depreciation & Amortization	10,505.00	10,157.00	10,903.00	12,547.00	11,056.00	11,284.00	11,104.00	11,519.00	11,445.00	11,445.00
Amortization of Goodwill and Intangible Assets										
Total Depreciation & Amortization	**10,505.00**	**10,157.00**	**10,903.00**	**12,547.00**	**11,056.00**	**11,284.00**	**11,104.00**	**11,519.00**	**11,445.00**	**11,445.00**
Amortization of Deferred Charges										
(Gain) Loss From Sale Of Asset										
(Gain) Loss on Sale of Investments										
Asset Writedown & Restructuring Costs										
Stock-Based Compensation	4,210.00	4,840.00	5,340.00	6,068.00	6,829.00	7,906.00	9,038.00	10,833.00	11,688.00	11,688.00
Tax Benefit from Stock Options										
Other Operating Activities	5,424.00	5,800.00	(33,034.00)	(992.00)	(312.00)	(4,921.00)	1,006.00	(2,227.00)	(2,266.00)	(2,266.00)
Change In Accounts Receivable	527.00	(2,093.00)	(5,322.00)	245.00	6,917.00	(10,125.00)	(1,823.00)	(1,688.00)	(3,788.00)	(3,788.00)
Change In Inventories	217.00	(2,723.00)	828.00	(289.00)	(127.00)	(2,642.00)	1,484.00	(1,618.00)	(1,046.00)	(1,046.00)
Change In Accounts Payable	2,117.00	8,966.00	9,175.00	(1,923.00)	(4,062.00)	12,326.00	9,448.00	(1,889.00)	6,020.00	6,020.00
Change in Unearned Revenues	(1,554.00)	(593.00)	(3.00)	(625.00)	2,081.00					
Change in Other Net Operating Assets	(902.00)	(8,480.00)	30,016.00	(896.00)	881.00	(4,470.00)	(7,909.00)	(1,382.00)	2,465.00	2,465.00
Cash from Operations	**66,231.00**	**64,225.00**	**77,434.00**	**69,391.00**	**80,674.00**	**104,038.00**	**122,151.00**	**110,543.00**	**118,254.00**	**118,254.00**
Memo: Change in Net Working Capital	*405.00*	*(4,923.00)*	*34,694.00*	*(3,488.00)*	*5,690.00*	*(4,911.00)*	*1,200.00*	*(6,577.00)*	*3,651.00*	*3,651.00*
Capital Expenditure	(12,734.00)	(12,451.00)	(13,313.00)	(10,495.00)	(7,309.00)	(11,085.00)	(10,708.00)	(10,959.00)	(9,447.00)	(9,447.00)
Cash Acquisitions	(297.00)	(329.00)	(721.00)	(624.00)	(1,524.00)					
Sale (Purchase) of Intangible assets										

Apple's cash flow statement - 2024

I divided the net income of $93.7 billion with the number of shares outstanding of 15.4 billion and I got to $6.08 per share. We can then put the $6.08 earnings per share into our template.



Now that we have the current value creation input, the next big question is the growth going forward. How much will Apple's value creation for owners grow in the next decade?

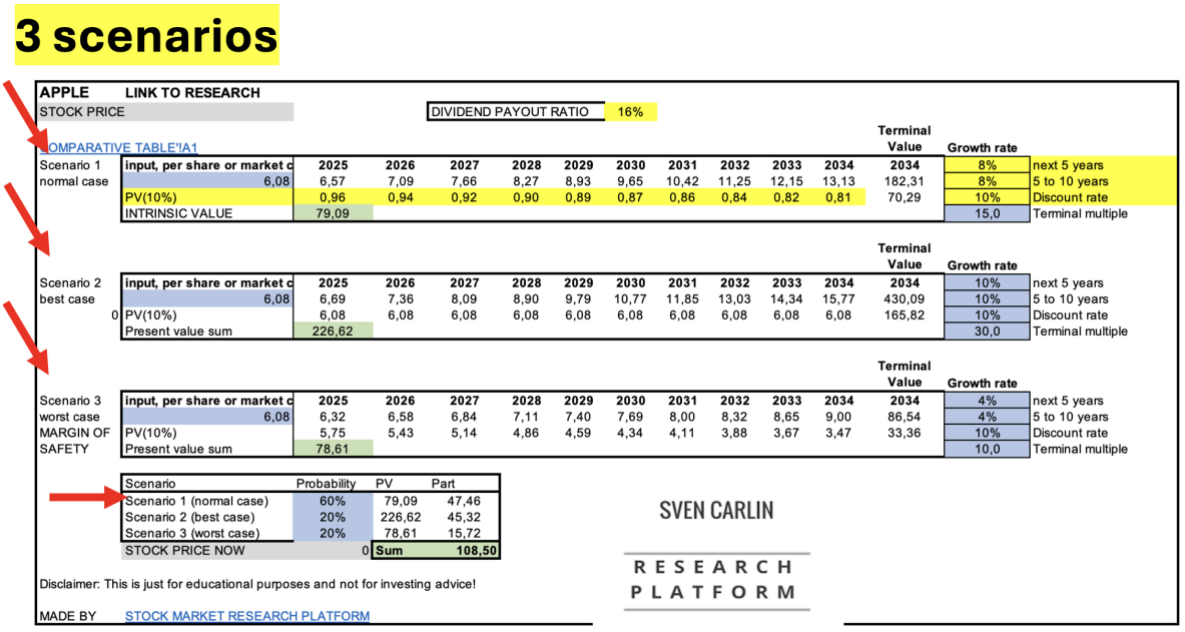
To answer that question we need to go into the analysis of the business - which is the core of investing. At the end, an investor owns a business and gets rewarded from business ownership. I have separated the growth estimation in two parts, the first 5 years that can be estimated closer to the current growth rates, and the next 5 years that have to be in line with possible average growth rates for a sector. Of course, it is impossible to precisely estimate the future of any business, but we can vaguely estimate things and that is why a good mental exercise is to have 3 scenarios.

SCENARIOS

Thinking in scenarios covers the essence of value investing; thinking of risk first. The first scenario shown below is a normal case scenario, then we have an exuberant or best case scenario and a third margin of safety scenario.

The third scenario makes value investing easy, if in the worst case scenario you still do well with an investment, it is then an investment that provides a margin of safety as no mattter what happens, you should have a positive return. If you can find that, and that is not something one can find easily, then you have a value investing opportunity.

Most people focus on the best case scenario and dream about the rewards, but often forget about the risks.



The bottom arrow shows where you can put in probabilities and then it sums up the individual values per scenario for an intrinsic value.

The better you know a business, the easier it will be to allocate probabilities to the scenarios and when it comes to inputs, an important thing to mention is that people fear making a mistake because it's bee taught at school that we always have to be precise. Let me again quote Buffett on this one:

Warren Buffett: “It is better to be approximately right than precisely wrong.”

When it comes to estimating future outcomes, I am 100% sure I will be wrong, but my goal is to be vaguely right. Overtime, the model can be adjusted to new information . If it is too hard to find the right estimate, or to difficult to be vaguely right, simply put the investment opportunity onto the too hard pile and find investments that offer more certainty.

Now that we know how to estimate the value creation input and the growth rate, we can calculate the present value of future potential cash flows for which we also need a discount rate.

I will first discuss all the factors and then apply those step by step for Apple as an example.

PRESENT VALUE CALCULATION AND DISCOUNT RATE

The earnings per share for the value creation and the growth rate allow us to caluclate the present value of the future cash flows. To calculate the present value of a future cash flow, we need the present value formula and a discount rate.

$$PV = FV \frac{1}{(1+r)^n}$$

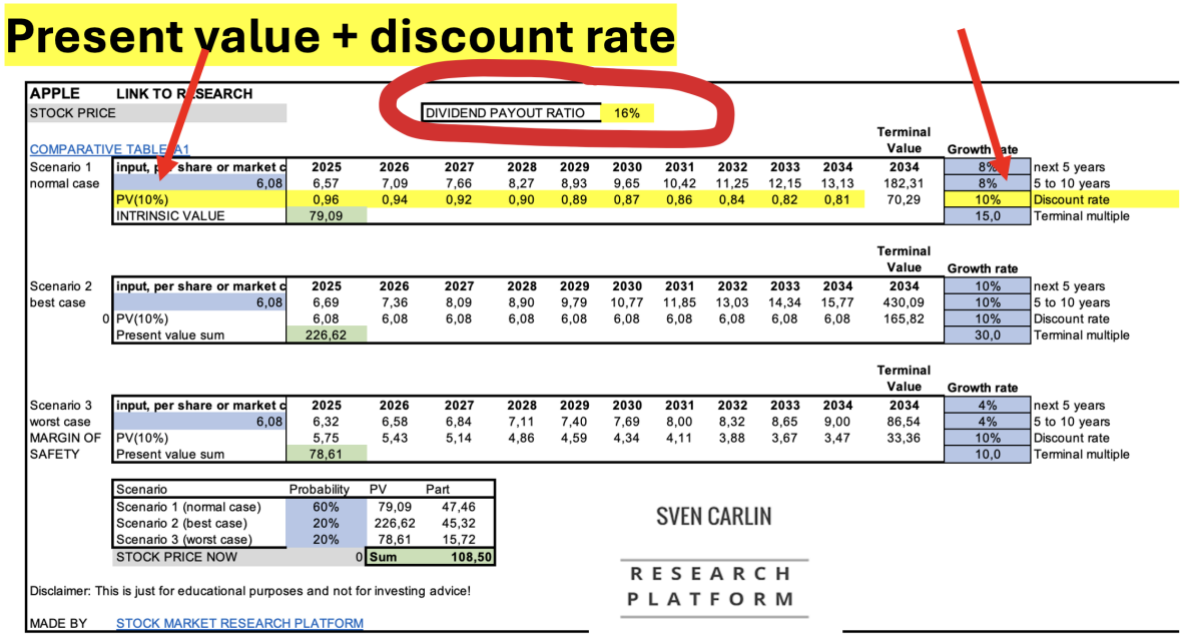
PV = present value

FV = future value

r = rate of return

n = number of periods

The above formula has already been implemented in the intrinsic value template. It calculates the present values of the cash flows you can expect over the next 10 years from an investment.



When it comes to the value created, it is important not to count things twice. Apple's earnings per share are $6.08 and if there is growth of 8%, next year the EPS is $6.57. Apply a 10% discount rate to the $6.57 and you will get $5,97. That is the present value of the value to shareholders Apple will likely create next year, however, it is not the value you will get as shareholder. Only the dividend cash payment is what gets to your account, and

that is why I have put a dividend payout ratio into the intrinsic value template. Apple pays out 16% of net income for dividend and the rest is spent on buybacks. Buybacks are also an example of shareholder yield, but those buybacks increase growth in earnings per share going forward, so if we account for that already in the growth estimates, it can't be calculated again in the present value segment. Always remember, intrinsic value is the CASH you are going to get from an investment. To calculate the present value of that cash, we need a discount rate.

DISCOUNT RATE

When it comes to the discount rate to be used, you can complicate your life or keep it simple, it is up to you.

Academia discusses the discount rate as the risk free 10-year rate on the US Treasury. Sometimes they like to use the WACC rate (weighted average cost of capital). Further, if the risk is higher, some say a higher discount rate should be applied and vice versa. In my opinion, all those academic discount methods only bring complications that make those people look smart while allowing them to charge high fees for supposedly educating people about those same complications. By trying to solve those complications, you can get a Ph.D., but it doesn't help much when it comes to investing.

I prefer Buffett's way, even though Warren and Charlie Munger never clearly stated what discount rate they use (Buffett calls it: "a proper discount rate"), from all the info I gathered through the dozens of Berkshire conference calls I listened to, I believe they are using a discount rate between 8 and 10%. Perhaps 8% is now Berkshire's target goal due to its size.

Thus, by using a fixed discount rate of 10%, or 8%, whatever you prefer, you solve all the problems related to estimating the 'proper' discount rate and all that is left is an easy way to compare your investment opportunities. Also, I believe a 10% return is the minimum return requirement for value investors. If there is nothing that offers 10%, you simply do nothing...

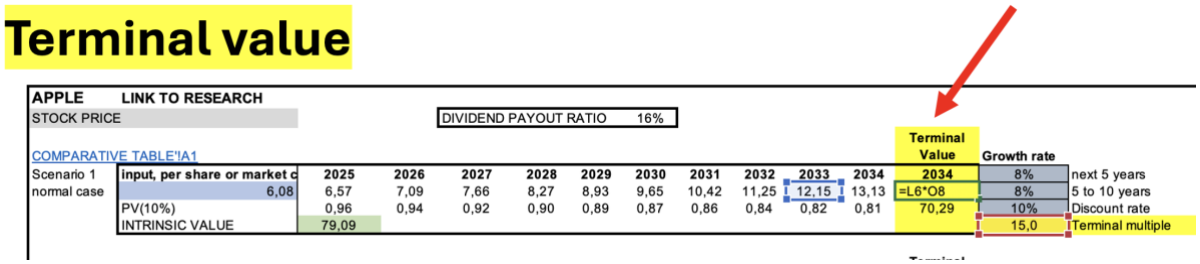
A 10% discount rate allows you to compare investing opportunities and also gives you a minimum return level to aspire to. As I am writing this in January 2025, Warren Buffett has $325 billion of cash yielding around 4% from US 3-month Treasurieas. When he finds somewhere to invest the billions for an 8% yield or higher with low risk, he'll deploy them, until then, 4% with no risk is ok.

Now that we have the discount rate, the dividend payout ratio, we still need one factor to calculate the intrinsic value for Apple: the terminal value.

THE TERMINAL VALUE & TERMINAL MULTIPLE

To simplify things, given that our goal is to be vaguely right, not precisely wrong, I have added a terminal value to the intrinsic value template that shows what would one get if the stock owned would be sold in 10 years.

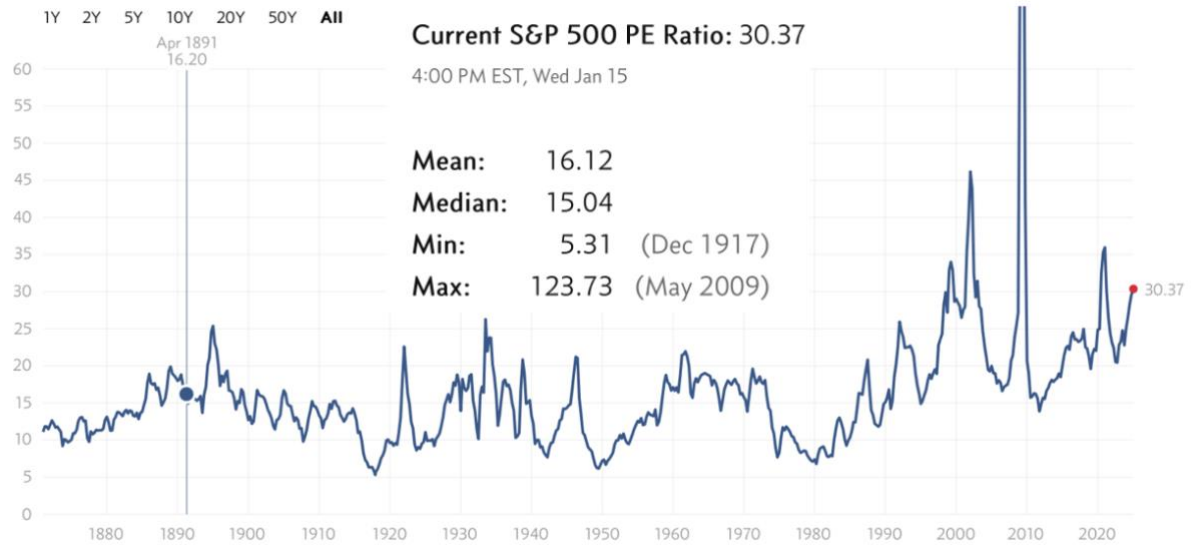
To get to a terminal value, we have earnings growth that gives us the earnings in year 10, or better to say year 9, because only when year 10 ends, we'll have the respective earnings for that year. (whatever year you are reading this from, it is likely only the previous year earnings are available now, which is what is used for PE ratios)



The terminal value is an estimation of the cash you get in the last year of the assumed ownership. To get to the sale cash received, I multiply the previous year earnings with an estimated terminal multiple - i.e. future price to earnings ratio.

Of course, it is impossible to predict what the PE ratio will be 10 years down the road, but as this is value investing, the simple way is to be conservative or prudent with the estimation.

The PE ratio of the S&P 500 has historically been between 7 and 30 adjusting for outliers with the average being 15.



S&P 500 PE ratio - Source: Multpl

A prudent value investor would go for a terminal multiple or PE ratio of 10 which would lead to a very low present value but that would keep investing risks at minimum. Perhaps the fair thing to do is to put a low terminal value in the margin of safety or worst-case scenario, a bit more exuberant one in the best case scenario and a fair, historical average for the normal/base case scenario.

To give another example, Berkshire's PE ratio has historically been between 10 and 20. Here is where the scenarios come in handy and give an additional contribution to our investing decision making. A low terminal multiple tells the risk or perhaps where would be a margin of safety, a high terminal multiple indicates the potential reward in an exuberant environment while the base case and average multiple gives an indication of the most likely long-term outcome. Over a period of a decade, it is very likely a business will be seen by the market in all 3 scenarios: booming, panicking and average.

Another example, in 2016 when I first properly analyzed Apple the PE ratio was just 10 on slow expected growth going forward. Now, Apple's PE ratio is close to 40 on huge growth expected.

Now that we have it all, let's calculate the intrinsic value of Apple.

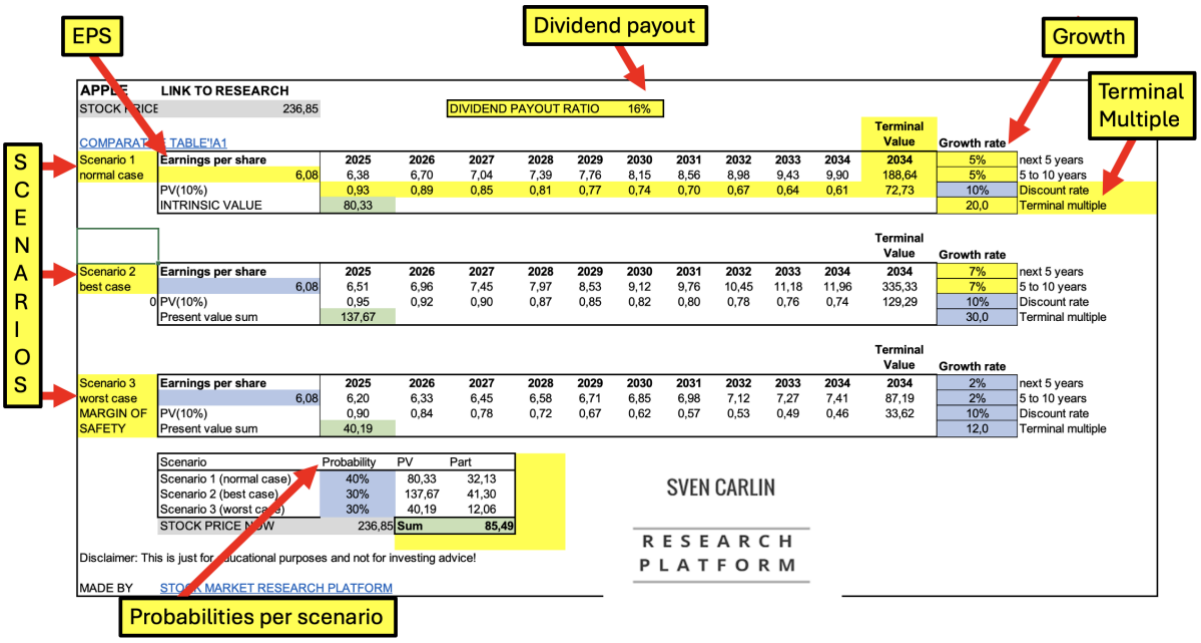
Intrinsic Value Calculation - Apple

We have the following inputs to consider for an intrinsic valuation of Apple stock:

- Value creation : EPS (earnings per share)
- Dividend payout - percentage of EPS paid as dividend
- Growth 1st to 5th year and 5th to 10th year per scenario
- Terminal multiple per scenario (PE ratio after 10 years)
- Probabilities per scenario

For Apple I have made the following estimations (time of writing: 16 January 2025):

- EPS: $6.08
- Dividend payout: 16%
- Growth in first 5 years: 5%, 7%, 2% - last 5 years: 5%, 7%, 2%
- Terminal multiple per scenario: normal: 20, best 30, worst: 10
- Probabilities: normal 40%, best 30%, worst 30%



Call me crazy, but my opinion for the intrinsic value for Apple comes out to $85.4, which is a lot number compared to the stock price of $230.

And that is a great comparison of what value investing is about compared to the current world we live in. Until Apple hits a stock price level for a good return, I'm not interested. Yes, maybe it will grow earnings 15% in the next 5 years, maybe not, but again, value investing is about limiting the 'maybe' factor to the smallest possible impact.