ValuAnalysis

14th May 2021

ValuInsight – Debunking the "Equities and Interest rates" issue

- **The impact of inflation on equity valuation is theoretically nil.** Equity ownership represents a claim on real assets. Free Cash Flow (FCF), which remunerates this claim, is the result of a real economic rent minus a real investment (not an accounting depreciation). FCF generation should therefore be impervious to inflation. To ensure consistency, the equity discount rate should be stripped of inflation expectations, too.
- **Yet the equity valuation model is not watertight when inflation expectations rise; leakage occurs, impacting the risk premium.** FCF integrity depends on a perfect and synchronous pass-through of inflation on costs and revenues. Anything less than perfect creates the potential for a margin squeeze. Elsewhere, higher ***nominal*** interest rates increase financial charges which impact the levered (i.e. after financial costs) FCF. And, finally, uncertainty on the inflation outlook creates uncertainty on the monetary policy response. All of this commands a higher risk premium, resulting in an upward-drifting equity discount rate. But this is only a second order effect, far less impactful than market gyrations suggest.
- **Investors don't need an inflation excuse to increase the discount rate, though.** They can increase the risk premium, perhaps even the level of the (real) risk-free rate, whenever they want to. We investigate the impact of a 100bp increase in the discount rate on the value of equities.
- **At the current level of discount rate (ca. 5%), an increase of 100bp to 6% will** 1- reduce the normalised FCF multiple from 35x to 25x, its long-term average, 2- increase the expected return from 5.8% to 6.4%, and 3- reduce the present value by ca. 25%. This is modelling, not a prediction, and least of all a worry: equity volatility averages 16% over the long-term; 25% is one standard deviation away, well within the norm.
- **What this won't do is terminally collapse the value of growth stocks, as commonly argued (provided that they are really growing)**. The market price of growth is asymptotic: investors typically pay less per additional unit of growth. In other words, growth stocks are priced with a steeper fade than the median stock, which means that their effective "duration" is nowhere near as long as often thought.

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Equities and Inflation

Since November 9th, 2020, the sector rotation out of "growth" into "value" stocks (favouring Financials, Resources and Cyclicals) has been explained by, or blamed on, the yield increase at the long end of the bond market (in short, the 10-year US Treasuries yield moving from 0.9% to 1.7% in a few months), itself due, it seems, to higher inflation expectations. We are quintessentially bottom-up stock pickers, and always reluctant to write about anything other than stocks. Yet we feel that we cannot shy from the dreaded question: does a change in inflation expectations change the value of equities?

A Confusing Issue

Professor Damodaran, the most prolific specialist in equity valuation techniques, warns in his presentation about discount rates that *discount rates obviously matter in DCF valuation, (…but…) they don't matter as much as most analysts think they do*.

In practice, the problem starts with a clean extraction of inflation expectations, as it is uneasy to split the 10-year yield (we will use this as a proxy for "risk-free rate" from here on) between its real yield component and its inflation component. Admittedly, anything can be calculated, inferred, just like the realised risk premium of equities can be observed and measured historically. Quite how investors use this information for their future decisions is another question altogether.

There is some self-inflicted harm, too. In our view, analysts are usually not going about it in the right way. Even Professor Damodaran, in the same material as quoted before, does not offer much help. In one of his slides, page 21, we read:

"Nominal versus Real: If the cash flows being discounted are nominal cash flows (i.e. reflect expected inflation), the discount rate should be nominal."

We assume that Pr. Damodaran means that the opposite is true, too ("real cash flow, the discount rate should be real"), but it is not clear to us why and how some cash flows should be calculated reflecting expected inflation, whilst some cash-flows should or could not. In the table below, we assume a 5% inflation affecting both revenues and cash costs (the issue around the lag effects, or the inability to pass on cost increases to the final payer can be analysed as a margin issue, see page 5, and not, as such, as a valuation issue).

Simplified Cash Flow Statement under 5% Inflation		
Inflation		*+5%*
Revenues	100	105
Cash Costs	-90	-94.5
Free Cash Flow	10	10.5
FCF margin	10%	10%

SOURCE: VALUANALYSIS

Simplified calculation of a business rent		
Inflation		*+5%*
Assets at Replacement Value	80	84
FCF (see previous table)	10	10.5
Rent (FCF/Assets)	12.5%	12.5%

SOURCE: VALUANALYSIS

We are not quite sure if this cash flow should be called "nominal" or "real", but it is crystal clear that inflation flows through the P/L and the cash flow statements and does not "affect" them. **Cash generation as a margin is unaffected by inflation.**

The source of the confusion, and the reason why analysts get in a muddle with this issue, stems from designing Discounted Cash-Flow models (DCF) with Free Cash Flow as an input. This is putting the cart before the horses. FCF is an ***output***, the result of an economic rent that a company is able to capture and produce. This rent is only correctly calculated with the *replacement* cost of the firm's economic assets. The pertinent question, therefore, is: "does inflation affect the rent of a business?". The answer is, evidently, "no", because the rent is a real claim on assets (at replacement value). Thus, the rent should be calculated as in the following table:

FCF as an output requires a properly built DCF framework, modelling the operating rent and the growth in assets separately, which, combined, produce net FCF[1].

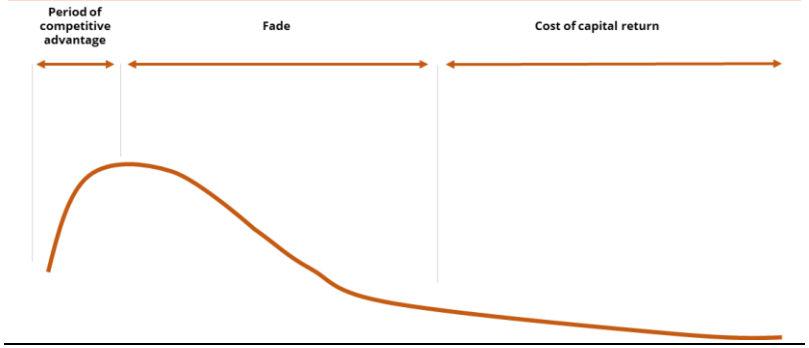
Modelling the operating rent

We have addressed many times the calculation of the operating rent of a business, which is the Internal Rate of Return linking Gross Economic Assets at replacement value and Gross Cash Flows over an asset life. We used to call it CROCI at Deutsche Bank, others call it CFROI. The benefit of modelling the rent trajectory is that it forces the analyst to think about the fade of the business, rather than assume a terminal value[2]. We will see in Part 2 that this is a crucial point. The following picture schematically shows how the return on capital, or rent, of the median company is priced by the market:

[1] For those interested in details, the operating rent already has an inbuilt assumption of asset maintenance at zero growth. This "maintenance" is calculated as the economic depreciation of the stock of assets. The reason is that the model works on the assumption that assets are *at replacement value*.

[2] All these things are, in the end, equivalent; this is not about being right or wrong, but, rather, about being accurate or imprecise. When the median expected return is perhaps 6% and the median volatility 17%, accuracy matters...

The three periods of a typical fade profile



SOURCE: VALUANALYSIS RESEARCH

A terminal value is bound to model these three periods inaccurately, as they differ from one company to the next, depending on the sector, the competitive advantage and the life cycle. Some companies / sectors are well advanced in their life cycle and have become cost of capital businesses (e.g. Cement, or Telecom). In this case, they will be priced with a directly falling or flat return profile, as there is no hope of enhancing the return unless the company changes its assets mix. But cost of capital businesses are an exception. As a default, the market will tend to assume that the median company has, ahead of itself, some combination of these three phases.

Modelling Growth in Capital Invested and FCF

Similarly, net capital employed (tangible and intangible, on and off-balance sheet) will grow according to the sector in which a company competes, as well as the availability of funding and, marginally so, the strategy of management. Like in the previous instance, where the rent was fading to the cost of capital, investors will assume a convergence of the company's current growth rate in assets towards an end point, "steady state" economic growth (GDP, or something close to it).

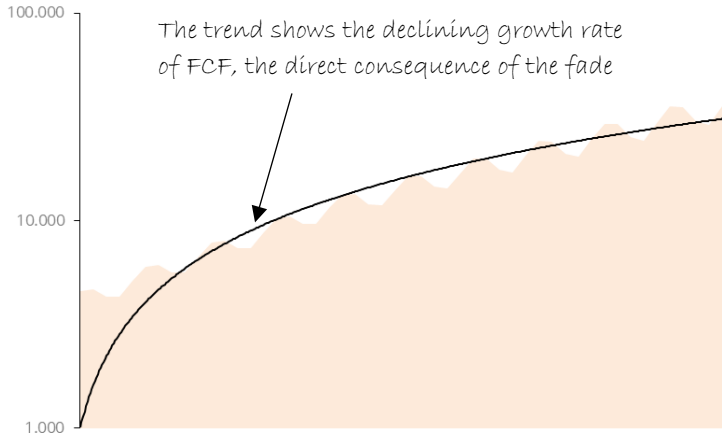
Generic Rent and Growth profiles with a fade after a period of competitive advantage – First 50 years

SOURCE: VALUANALYSIS RESEARCH

At this point, it is clear that all parameters driving equity valuation are "real", or adjusted for inflation:

- The rent, because it measures a claim on a real asset, and
- The growth rate in assets because the latter are measured at replacement value (that's the difference between earnings and FCF, and why the value of an investment is the present value of FCF, not earnings).
- Consequently, the resulting stream of FCF will be "real", too.

Rent + Growth = Free Cash Flow – First 50 years



SOURCE: VALUANALYSIS RESEARCH

For consistency, the discount rate applied to compute the Net Present Value has to be real, too. Thus, it can be easily demonstrated that the three components of a properly designed DCF are "real", i.e. inflation adjusted. It follows, preliminary, that **a change in inflation expectations does not radically affect the structure of a discounted cash-flow mechanism, aka the equity market.** But it might do so marginally.

Inflation Leakage likely

The mechanics of asset pricing are impervious to a change in inflation expectations, but we can see the possibility of some "leakage". Nominal yields are visible and real yields are inferred; it is plausible that some confusion might occur as bond yields rise. But the most likely impact is on the risk premium.

"Top-down", a change in inflation expectations will likely trigger a monetary policy response. History tells us that monetary policy is a blunt instrument and a source of major uncertainty, for which investors are likely to demand an additional risk premium.

"Bottom-up", a smooth, synchronous pass-through of inflation to revenues and costs is unlikely. What **is** likely is that margins will become more uncertain, depending on the ability of the firm to resist price increases from suppliers and workers, and its ability to force price increases onto its clients.

If we consider *levered* FCF (i.e. after financial costs, to determine the value of the equity, not the enterprise), higher **nominal** interest rates will increase financial costs and lower available FCF, resulting, perhaps, in an unsustainable financial leverage.

All of the above is likely to increase the risk premium, and, in that sense, a change of inflation expectations does have a second order effect on the discount rate applied to equities, even though this discount rate is, theoretically, real.

Equity Sensitivity to the Discount Rate

Even though a change in inflation expectations *stricto sensu* has a limited impact on the discount rate of equities, bar some leakage, investors don't need an inflation excuse to increase it. They can increase the risk premium whenever they please. Possibly the real rate, too. In this section, we investigate the sensitivity of equity valuation to the real discount rate.

The Market

Our representative sample of non-financial stocks trade on ca. 35x normalised net FCF and carries an implicit discount rate of ca. 5%. We note with interest that the Schiller PE ratio, as of March 2021, is also approximately 35x. The samples are different (Schiller is for the US market only and calculated across all sectors). Furthermore, Schiller "e" could be described as backward-looking (it is based on a historical average), whereas our normalised net FCF incorporates our best assessment of selected future trends, especially an ability of platform businesses (Alphabet, Facebook, but also IQVIA etc…) to leverage their services and sustain higher rents for some time, as well as a transformational move in some key sectors such as chips, cloud, AI, producing a tectonic shift in productivity and consumption. On a scale running from Schiller to Catherine Wood, in other words, we are a notch closer to the latter. Nevertheless, both the Schiller "e" and the VA net FCF are inflation-adjusted, and in the long-run, inflation-adjusted earnings and net FCF are convergent; the similarity in the multiples is not entirely coincidental, in our view. The following table summarises the key parameters at 5% and 6% discount rate:

Market valuation at 5% and 6% discount rate

Discount rate	*5%*	*6%*
Multiple of FCF	35x	25x
Expected Return	5.8%	6.4%
Asset multiple	3.38x	2.42x
Change in value	-	≈-25%

Source: ValuAnalysis

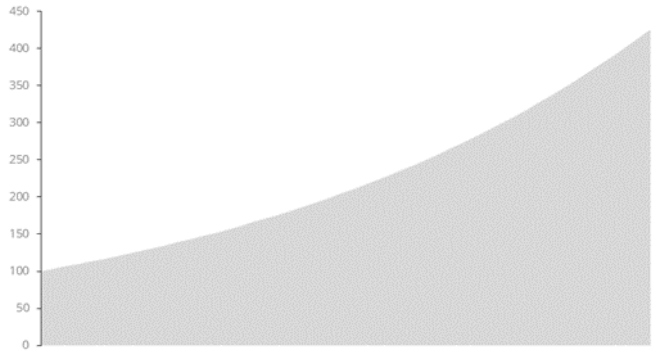
This is not a prediction. Perhaps just a reminder that indeed, the value of a stream of cash flows falls if the applied discount rate increases… But at least three variables can mitigate the outcome: the level of the rent, the growth rate of economic assets and the fade applied to both. In any case, with average equity volatility at around 16%, this is roughly one standard deviation away from the median, hardly more than noise in the long run.

What is more interesting is to figure out if there is a typology of stocks more or less affected by an increase in the discount rate.

Is Growth bad?

Growth in assets, even at a very small clip, will work against investors in the event of a higher discount rate, because it drags more FCF into the future, increasing the duration (or the sensitivity to interest rates) of the stream of cash flow. On the next chart, this is the profile of net assets growing at only 3% over time.

Assets growing at 3% over the first 50 years



SOURCE: VALUANALYSIS RESEARCH

50 years might sound like a meaninglessly long time. But the discounting mechanism assumes going concern, i.e. infinity, an even less meaningful concept for the human brain. In practice, discounted cash flows beyond one hundred years have no present value, but the first 50 years are significant enough.

[3] This is theoretical and difficult to observe because companies change their business exposure to survive this decay. But it is clear and well documented that a competitive advantage tends to be competed away either by the incumbent to protect its market share, or by attackers to capture some of it.

If growth is penalising value at a higher discount rate, excess return, on the other hand, is good. At a given level of growth, a higher excess return (over the cost of capital) will mitigate the adverse effect of a higher discount rate, because the shape of the rent will be the exact symmetry of the previous chart. The rent naturally reverts to the cost of capital over time, and starts at its highest level, typically[3]. Note however that the mitigation from a higher rent is relatively small, perhaps 1 to 2% of value.

Equity duration – a misunderstood concept

We have all read it many times; a higher discount rate is bad for growth stocks. Here is the mistaken framework that allows some to make this prediction.

A theoretical company growing at 4% with a rent of 30% will lose 19% of its value if the discount rate goes from 5% to 6%, whilst the same company will lose 34% of its value if it is growing at 15%. Scary? Let's not sell all our growth stocks just yet.

Whilst this computation is indisputably correct mathematically, it lacks the disclaimer of practical experience. What matters is not the theoretical framework but the way in which stocks are priced. And, in practice, **the market price of growth is always asymptotic**.

This means that investors in aggregate tend to pay less per additional unit of growth. We can easily demonstrate this with a simple earnings multiple. In the first example above, rent of 30%

and growth of 4%, the multiple is 23x. In the second case (30% rent and 15% growth), **with the same fade assumption**, it should be… 117x. Whilst some marginal stocks might be on a triple digit PE ratio for speculative reasons, we know of no stock within our universe of 600 global names whose normalised net FCF multiple is higher than, say, 60x.

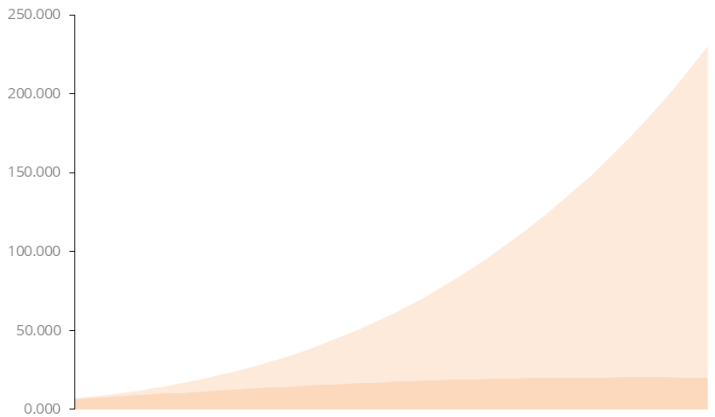
The example of Alphabet

Alphabet has a normalised operating rent of 22%. We normalise its net FCF (after almost $12bn of Stock Based Compensation taken as an operating cost) at ca. $34.5bn, putting the shares on a net FCF multiple of ca. 41x. Its growth rate is around 17%. These economic characteristics are close to our theoretical example, except for the multiple: 41x rather than 117x.

This means that the market assumes a much faster fade for a fast-growing company such as Alphabet, and never values high growth assuming a "market fade".

We call "market fade" the average fade of an average-growing company. Empirically, this fade is about 3% per annum. In the case of Alphabet, the fade consistent with a 41x FCF multiple is about 5%. If this does not sound like a big difference, the following two charts, where we plot the theoretical FCF calculated with a 3% fade in both rent and growth, and the one expected by the market, i.e. with a 5% fade, might be more convincing. Both charts are on the same scale.

FCF (light orange) and discounted FCF (dark orange) with 3% and 5% fade over the first 50 years



SOURCE: VALUANALYSIS RESEARCH

We are not expecting anyone versed in equity valuation to be bowled over by this. What is surprising is that there can be a belief in a general rule about growth stocks being materially more impacted by a change in the discount rate. This is the same misconception as high multiple stocks being growth stocks.

In the case of Alphabet, and provided that it does deliver its expected growth rate, we estimate that its value will be affected roughly in the same manner as a lower growth stock, in the event of a 100bp increase in the discount rate.

We would be ready to generalise this observation and assume that all stocks have roughly the same sensitivity to a change in the discount rate (with perhaps some exceptions such as Financials and highly leveraged companies), as the market adjusts not growth, but the *fade* in growth.

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Recommendation	**Number**	**% of total**	**Number**	**% of total**
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The above table covers the period 29th January 2020 to 11th February 2021. This disclosure is reviewed and updated on a quarterly basis. Last updated *11th February 2021*.

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