Posted by DAVID R RICHARDSON

Posted on 1/14/2010 11:32 PM

What equity premium puzzle?

The equity premium puzzle has been around a long time. DeLong and Magin provide a good review of the literature and of the attempts to solve the puzzle. Indeed, given all the firepower that has been focused on the puzzle it is time perhaps to question the puzzle itself.

It seems that an answer to the equity premium has been staring us in the face for ages. The observed equity premium is an ex post measure of total returns from holding shares. It has been assumed that the returns from holding shares would be equal to the risk free rate of return in the absence of an equity premium. However, the investment decision is made ex ante and it is not at all clear that the ex ante decision will translate into the expected ex post relationship.

It will be shown here that the apparent equity premium can arise even in the absence of investors demanding an equity premium. All that is needed is basically the assumption that companies grow with the overall increase in the economy. That is all that is required to generate something that looks like an equity premium.

In the most simple case take an investment that will generate future returns R0, R1, R2 in years 0, 1, 2,"¦ For the sake of the argument suppose the annual return is growing at rate g so that

1) Rt+1 = (1+g).Rt

Suppose also that the market values the stream of returns according to the function:

2) V0 = f(R0, R1, R2 "¦,i) where i is the risk-free rate of return.

Equation 2 may well take the form:

3) R0.(1+i)0 + R1.(1+i)-1 + R2 (1+i)-2 + "¦ (Hopefully the reader appreciates that the text here does not do superscripts for the 0, -1, -2 etc. Please imagine where appropriate that these are powers.)

In this simple case there is no equity premium being applied to the valuations. Equation 3 is merely an expression for discounting the future returns with the discount rate being the risk-free rate. But we now look at the same calculation next year. Then

2a) V1 = f(R1, R2, R3 "¦,i) which again may take the form:

3a) R1.(1+i)-1 + R2.(1+i)-2 + R3 (1+i)-3 + "¦

Recall that by assumption Rt+1 = (1+g).Rt which implies

4) V1 = (1+g).V0

Equation 4 tells us that the capital gains on this investment are equal to g which will be part of the total return to the investor. It might be expected that the company will also make a dividend payment which, given the market valuation of the company implies a dividend yield of d. That gives total returns to the investor of g + d. Of course, g is here given by assumption while d will reflect the functional form of equation 2.

While d is not determined here, the orders of magnitude of this and the other variables are well-known. In an economy with nominal economic growth at around 5 per cent most other nominal magnitudes should be growing by roughly the same amount. Nominal growth at around 5 per cent in company revenues, costs and profits, together with market dividend yields of around 4 per cent would give an apparent equity premium of around 6 per cent given long term bond rates of around 3 per cent.

The crucial point is that so long as the profit stream is used to value the company in the same manner from time to time, then the rate of capital gains are independent of how the profit stream is valued so long as the functional relationship is homogenous to degree one in profits. Yet capital gains are the bulk of returns to equities over time. Since 1959 to date the average annual increase in the Dow Jones Industrial Average has been around 6 per cent despite the global financial crisis.

The homogenous-to-degree-one assumption seems a reasonable approximation in practice. Everything else being equal a company with twice the earnings should have twice the value. Similarly, a company the same in all other respects should have twice the value down the track when its earnings have doubled. Hence investors can value stocks by fully discounting future earnings without adding an equity premium. The result will still be an apparent equity premium when researchers examine actual returns ex post. But the equity premium is apparent, not real. The apparent equity premium is a statistical artefact that is produced despite the assumption here that investors discount stock market returns at the risk free rate of interest without any equity premium.

Of course, despite the argument here, investors may indeed demand an equity premium. That

would leave the capital gains component of actual returns unchanged so long as valuations are roughly homogenous to degree one in profits. Any equity premium demanded by investors must be reflected in the market dividend yield. Those considerations suggest that if the equity premium is to be found it will be reflected in the size of the dividend yield itself. Total returns will suggest an equity premium applies whether or not it actually does in the minds of investors.

We can conclude by noting that ex ante there need be no equity premium. Ex post there does seem to be a premium puzzle but it is probably a statistical artefact and merely reflects revaluations of an increasing profit stream as economic growth takes place.

David Richardson