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The lost decade

Extract from the forthcoming 2009 Barclays Equity Gilt Study

Global Asset Allocation Strategy 6 February 2009

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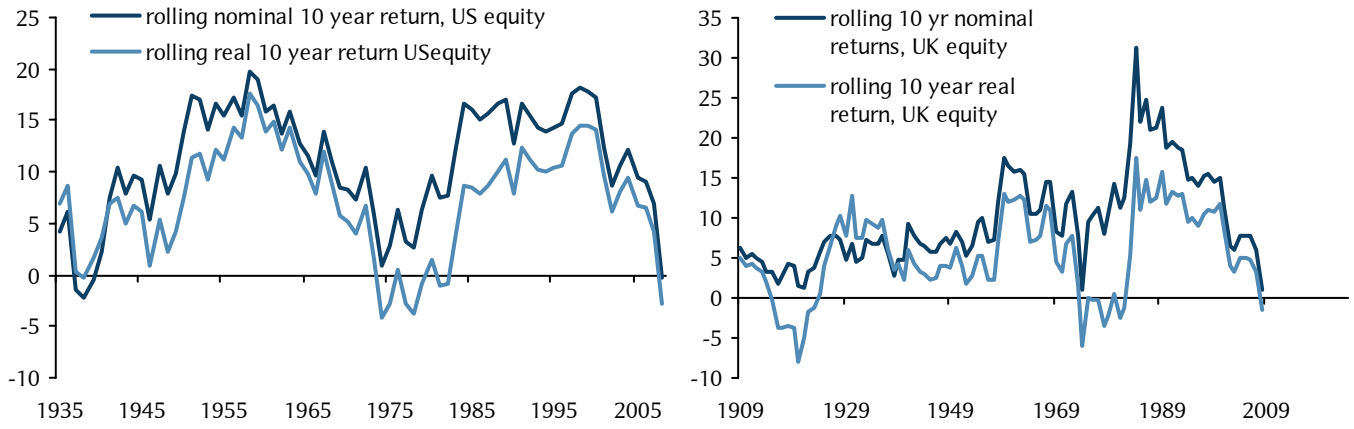
This essay is an extract from the forthcoming 2009 edition of the annual Barclays Equity Gilt Study, due to be published on Thursday 12 February. The Equity Gilt Study has been published continuously since 1956, providing data, analysis and commentary on long-term returns from financial assets in the UK and US. Our UK database begins in 1899, while the US database starts in 1925. The US data are kindly provided by the Centre for Research in Security Prices at the University of Chicago Graduate School of Business. Our purpose in publishing this data is to provide investors with a perspective on long-term asset returns. In the 2009 Study, in addition to this essay, we discuss asset returns under deflationary conditions, the permutations and causes of the credit cycle and an analysis of historical returns from a wide variety of asset classes. Our colleagues at BGI are also contributing two essays that examine the rapidly growing asset class of Exchange-Traded Funds and the effective practice of asset allocation.

Equity investors have been on a wild and ultimately disappointing ride over the past decade. Equities have been the worst-performing asset class since 1997, sharply underperforming all other asset classes. We examine the causes of this relative weakness, and find that the utility of simple valuation measures has been thoroughly vindicated by the dreadful recent returns from equities. We show how future long-term returns from equities – the equity risk premium – can be forecast. We also describe the factors that cause equity valuations to fluctuate over time. Finally, we compare the outlook for stock and bond returns over the next 10 years.

Equity returns over the past decade have been among the worst on record. In nominal terms, the -0.3% annualised return from US equities since 1998 is the fourth-worst 10-year return of the past 83 years. Only those 10-year periods ending in 1937, 1938 and 1939 have delivered lower returns. Similarly, over the past 110 years, only the decade ending in 1974 saw a weaker 10-year nominal return from UK equities. For the sake of record, the 1964-74 UK equity return was 1.02%, while the 1998-2008 return was 1.05%. In both the US and UK, the real total return from equities over the past decade has been negative.

Figure 1: 10-year rolling total returns, nominal and real, US and UK equities



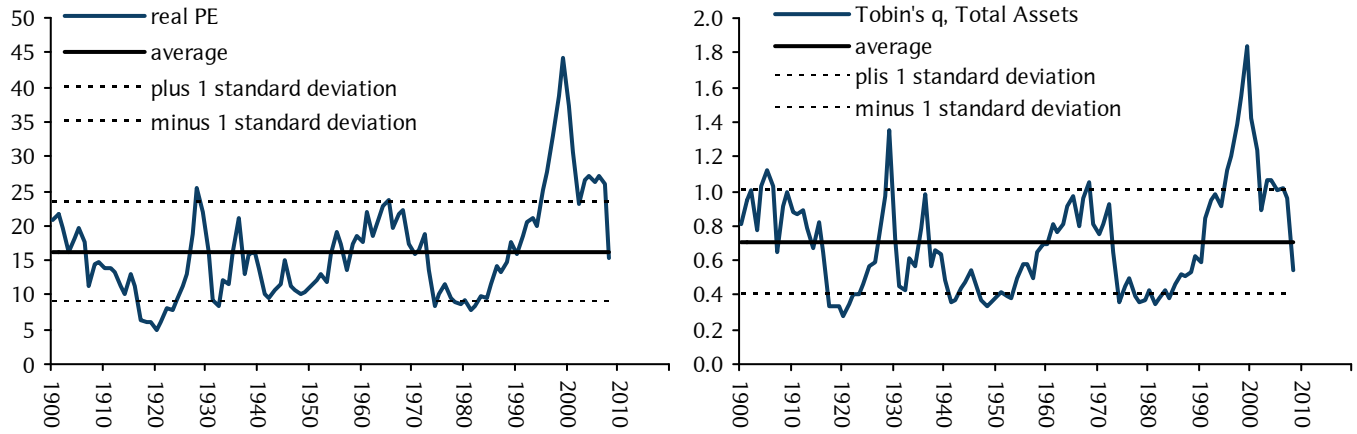
Source: CRSP, Barclays Capital

As a natural reaction to this long phase of poor returns, there has been much talk of the death of the equity 'cult'. While such talk may accurately represent investors' disenchantment with equities as an asset class, it is most likely a poor forecast for future equity returns. Prospective returns from equities are at the most attractive levels seen for some 20 years in the US and over 25 years in Europe and the UK, even if ex-post returns have been feeble.

The weak returns from equities over the past decade are not due to some intrinsic problem with the asset class. Rather, they are attributable to the extreme overvaluation of equities at the start of the decade. Although the growth in corporate profits has been robust over the period in question, investors were paying a very high premium to access these profits at the start of the decade. This premium has hampered, not to say eradicated, positive returns. From 1997 through to 2002, equities were valued at unusually expensive levels relative to earnings and corporate net worth. The collapse in equities after 2001 partially corrected this overvaluation, as equity prices declined by more than earnings during the 2001-03 global slowdown. The subsequent economic boom from 2003-08 generated a strong trend in profitability and in turn generated a strong rally in stock markets. However, throughout this period, valuations declined and equity prices generally underperformed profits. When the surge in growth ended abruptly in 2008, equity prices fell in line with the actual and expected decline in profits. Expensive valuations therefore caused equity returns to underperform profits following the 2001 slowdown and then did the same during the ensuing boom, while finally failing to provide a cushion when the business cycle turned down. Over the entire period, equities behaved like an expensive and eternally out-of-the-money call option on corporate earnings.

Put bluntly, the past decade has provided investors with an object lesson on the critical importance of long-term valuation metrics. In Figure 2 we display a history of the two most important of these measures for equities. The right hand panel presents the history of Tobin's Q – the market value of equity/corporate net worth. The series was constructed using data generated by Stephen Wright of the School of Economics at Birkbeck College. The left hand panel displays a trailing real PE ratio, using a 10-year moving average of earnings, drawn from data compiled originally by Robert Shiller.

Figure 2: Trailing real PE ratio, real, based on 10-year average earnings, Tobin's Q ratio (corporate equity market value/net worth at replacement cost), 1900-2009



Source: Shiller, Wright, Federal Reserve, EcoWin

The charts should serve to illustrate the extraordinary overvaluation of equity markets in the second half of the 1990s. From the end of 1996 onwards, the US was consistently valued at well over 1 standard deviation expensive to the long run average of both these yardsticks. The overvaluation was the most extreme of the past century and indeed of recorded stock market history. Perhaps unsurprisingly, subsequent returns from buying equities at such prices were poor, despite the 2003-08 period recording the strongest and most synchronised phase of global economic growth since the 1960s.

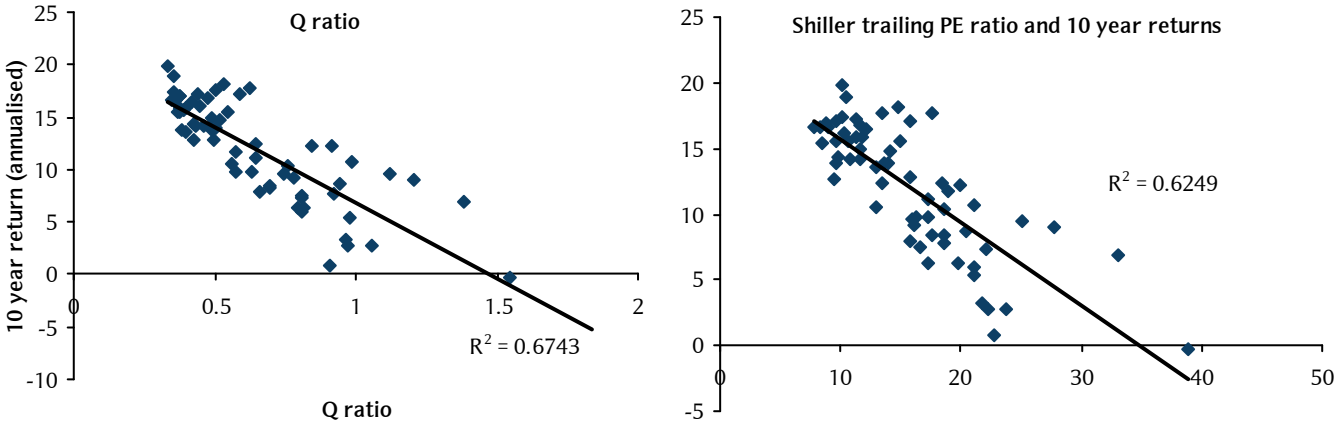
In essence, investors were paying too much to access corporate earnings and corporate assets during the stock market bubble years. S&P 500 operating earnings per share rose more than 50% between the end of 1998 and the end of 2008. European profits rose by considerably more. Had equity prices kept pace with earnings, we estimate that the annualised US equity real return would have been in the region of 3-4%, not minus 2.7%. A 3-4% real return is certainly well below the 6.4% long run average for US equities and it would have been below the 5.7% real return from government bonds, but at least it would have beaten cash, which delivered an annual real 0.7% over the period in question. As it was, equities were the single worst-performing asset class during the 1998-2008 decade for the sole reason that they were the most overvalued asset class at the start of that period.

The rather brutal lesson we can glean from the past 10 years is that valuations, rather than macroeconomic conditions, and the progress of corporate profits, are the core determinant of equity market returns. The investment industry as a whole devotes enormous resources to the analysis of each quarter's corporate profits and considerable effort is expended on forecasting the economic cycle. Yet very little attention is paid to aggregate valuation. Unfortunately, this balance of attention is flawed. Over the long run, equity valuations appear to be the primary driver of equity returns, with economic conditions and profit trends contributing little, if anything, to the overall total return from an investment in equities. Profits and growth explain the more minor fluctuations of equity prices from quarter to quarter and year to year, but they are incapable of explaining multi-year returns. Admittedly the converse also applies, in the sense that valuations tend not to be able to explain shorter-run fluctuations in the stock market. At time scales of much under five years, valuation becomes less relevant, with the economic and profit cycle becoming the key explanatory variables. However, since equities are typically held for the long run and are predominately owned by institutions or individuals with long liability structures, it would seem reasonable to suggest that

more attention should be paid to the predictive capability of valuations. In short, if the equity premium is forecastable, it makes sense for us to avail ourselves of the forecast.

To illustrate this point, consider the two valuation metrics mentioned earlier – Tobin's Q ratio and Shiller's PE ratio based on 10-year real earnings. Both these metrics have a solid empirical record of successfully forecasting equity returns. In Figure 3 we illustrate this relationship. The charts compare rolling 10-year annualised nominal returns from US equities to the Q ratio and to the real PE ratio at the start of each of the 10-year periods. The returns are plotted annually and the sample period begins in 1925. The charts demonstrate the strong negative correlation between these two valuation metrics and subsequent returns, showing how expensive valuations are associated with low returns and vice versa.

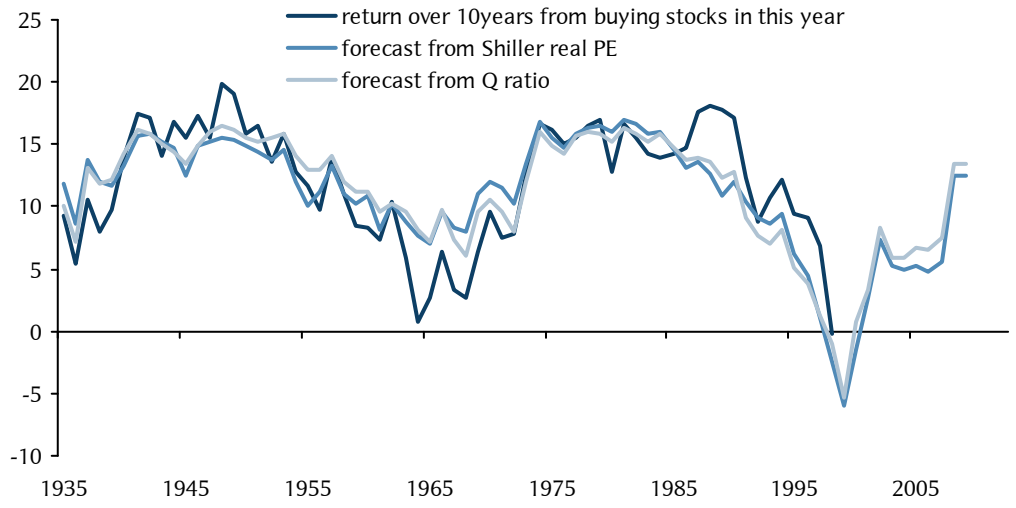
Figure 3: Correlation, 1935-2008, 10-year rolling annualised returns from US equities, real PE ratio and Tobin's Q ratio at the start of each 10-year period



Source: Shiller, Wright, Barclays Capital

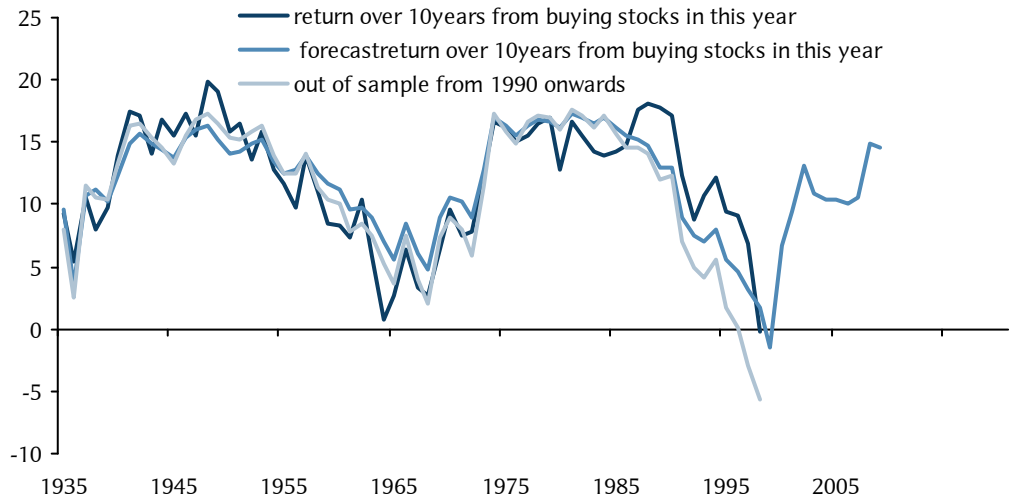
The relationships are sufficiently robust to allow the possibility of forecasting. Figure 4 illustrates the results of a regression exercise, where the Q ratio and the real PE ratio are used independently to forecast 10-year equity returns. Both variables produce very similar forecasts. In Figure 5 we combine both metrics in a single model and also perform an out-of-sample test on the methodology, stopping the regression in 1990 to allow the model to forecast thereafter. This test shows both that the relationships are reasonably stable over time, and that the model was effective in forecasting the general trend in equity returns after 1990. In particular, the model correctly forecast that equity returns would be negative over the past 10 years. The model failed to predict the 1997-2002 stock market bubble and therefore under-estimated returns in the periods ending in those years. However, any gains that an investor could have made from riding the bubble would have been temporary and reliant on an exceptional – and perhaps improbable – ability to time the market.

Figure 4: 10-year rolling annualised nominal returns from US equities, 1935-2008, actual and individually regressed from Q ratio and real PE ratio



Source: Shiller, Wright, Barclays Capital

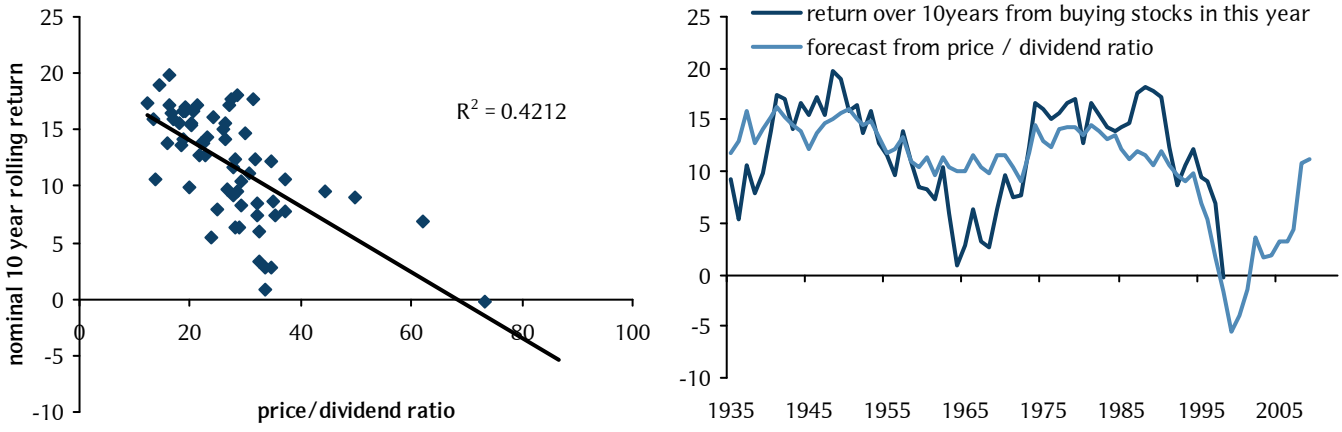
Figure 5: 10-year rolling annualised nominal returns from US equities, 1935-2008, actual and regressed from combined Q ratio and real PE ratio, with out-of-sample test from 1990



Source: Shiller, Wright, Barclays Capital

Currently, the model suggests that a purchase of US equities at the close of 2008 will deliver a nominal annualised return of between 12.4% and 13.4% over the next 10 years. This forecast is corroborated by a similar exercise with another long-standing valuation yardstick, the price/dividend ratio. We find this metric less efficient in forecasting equity returns, but nonetheless it produces statistically significant results, as illustrated in Figure 6. The price/dividend ratio, which was similarly over-valued at the 1998-2001 peak, suggests the future 10-year return (end-2008 to 2018) will be an annualised 11.2%. Averaging these various results produces a forecast for the future 10-year nominal equity risk premium of 12.3%.

Figure 6: US price/dividend ratio and 10 yr rolling nominal returns, correlation and regression model



Source: Barclays Capital

If the methodologies described above accurately forecast the past decade of poor equity returns, the question arises as to why these signals were broadly ignored by investors. It was certainly not due to a lack of information. By way of illustration, Robert Shiller's book *Irrational Exuberance*, which espoused the 10-year real PE ratio as a core yardstick for prospective equity returns, was published in 2000. Similarly, work by independent analysts such as Andrew Smithers highlighted the relative expense of equities signalled by Tobin's Q ratio as early as 1998. If the warning signals were available, they were not generally acknowledged by market participants. To be sure, the equity bubble of 1997-2001 was widely seen as such. At the time, proponents of a "New Era" in valuations were at least partly counterbalanced by a vociferous minority, who accurately defined the trend as an unsustainable boom. However, from 2004 onwards, the strong growth in profits generated by a buoyant global economy tended to obscure the point that equity returns were continuing to be dampened by a persistent trend towards lower valuations. Coincident returns were certainly strong, partially reflecting the strength in profits; however, once profits turned down, equity prices fell back in lock-step with the drop in earnings. Stock markets therefore underperformed earnings during the expansion, but performed in line with earnings during the contraction. At the start of 2009, equity prices are slightly lower than they were at the end of 1998, even though prospective profits for the impending year are likely to be considerably higher than they were in 1998, a deep global recession notwithstanding.

The fluctuation in equity valuations over the past decade demands a closer consideration. While it is easy in retrospect to ascribe weak returns to overvaluation, such an explanation does not tell us why the overvaluation occurred in the first place. To write the decade off as an epic example of the madness of crowds would seem to be too glib an analysis. Indeed, our own research has led us to the conclusion that simple irrationality may have played a much smaller role in moulding recent stock market returns than is popularly imagined. Rather, it seems that investors and the markets were in the grip of powerful forces that were hard for any individual to withstand. We can identify two particular – and perhaps related – fundamental trends at work.

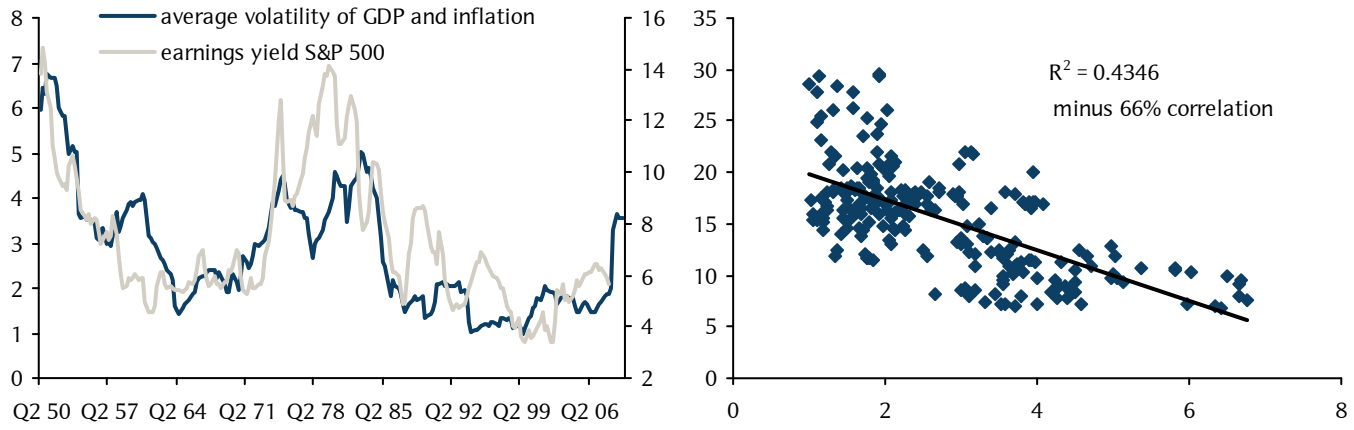
First, it is reasonable to suppose that the original decline in the forward-looking equity risk premium reflected the broad decline in macroeconomic volatility that occurred from the mid-1980s onwards. As the peaks and troughs of the business cycle grew less pronounced during the period generally termed 'the Great Moderation', so the volatility of profits and the intrinsic riskiness of corporate liabilities also declined. The fall in ex-ante equity risk premia, personified by the rise in PE ratios and the rise in equity market capitalisation relative to corporate net worth, can therefore be seen as a straightforward

extrapolation of prevailing conditions on the part of investors. As the collective memory of the 1970s faded, so the extrapolative process became more firmly embedded in market psychology. The limited macroeconomic volatility of the 1980s and 1990s came to be seen as the norm, while the 1970s were held to be an aberration attributable to poor economic structures – such as over-mighty trade unions – and poor economic management – such as excessively lax monetary policy. On the basis that these mistakes were recognised and therefore unlikely to be repeated, market participants understandably expected the decline in macroeconomic volatility to persist.

We believe that much of the move higher in equity valuations – and indeed the accompanying accumulation of leverage in the household, financial and corporate sectors – can be explained, if not justified, on this basis. Unfortunately, the extrapolative process generated its own downfall. The increase in equity valuations simultaneously increased the probability of poor future returns. In the same vein, the increase in general leverage on the basis of low macroeconomic volatility raised the sensitivity of the economic and financial systems to small changes in fundamentals. By 2007, a very modest tightening of monetary policy by the standards of past business cycles was sufficient to trigger a collapse in the over-extended US housing market, thereby tripping the global economy into the worst recession of the past 50, if not 70, years. In essence, the Great Moderation was inherently unstable and prone to self-dissolution because people recognised its existence and adjusted their behaviour accordingly. The eventual denouément was as sure and inevitable as the plot of any dramatic tragedy. Indeed, since the process was generated by the actions of human beings, it is perhaps unsurprising to find that the terms of analysis of tragic literature – hubris, harmatia, pathos and (it is to be hoped) catharsis – can translate so easily into the economic field.

To frame the discussion in somewhat more quantitative terms, we can illustrate the connection between equity valuation and economic volatility. A popular standard explanation for shifts in equity valuation highlights the empirical inverse correlation between PE ratios and inflation. While this explanation is observationally correct, it is intellectually unsatisfying. This is because it fails to explain why the valuation attached to an asset that correlates positively to inflation – the stream of corporate earnings – should exhibit a negative correlation in practice. If we instead regard the link between PE ratios and inflation as symptomatic of a deeper correlation between inflation and economic volatility, the pieces of the jigsaw fall into place. An accelerating inflation rate is an inherently unstable process because it is exponentially self-feeding. A persistent rise in inflation therefore raises current and prospective macroeconomic volatility. Under such conditions, the desire for a higher ex-ante equity risk premium is logical. As rising inflation raises the riskiness of the economic cycle, so investors demand a greater risk premium to compensate for an increase in the dispersion of future outcomes. In Figure 7 we illustrate this effect at work. The graph compares a moving average of the quarterly volatility of both real GDP growth and inflation to the US trailing earnings yield. Self-evidently, an increase in this measure of volatility generates an increase in the earnings yield and vice versa.

Figure 7: Five-year moving average of the sum of quarterly volatility in real GDP growth and inflation, S&P 500 trailing earnings yield

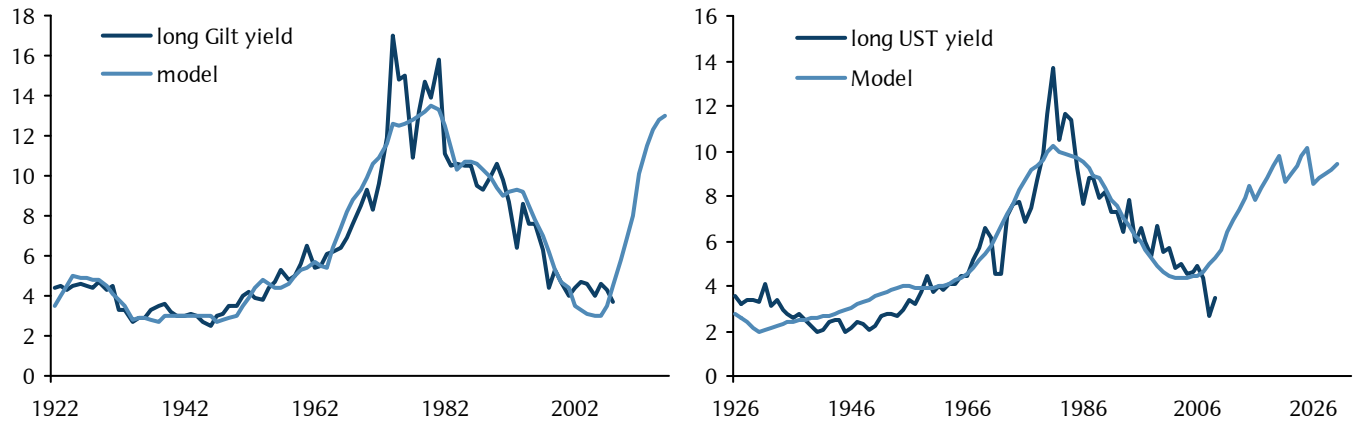


Source: Haver

The decline in equity earnings yields during the 1990s can therefore, be seen as a reaction on the part of investors to the decline in macroeconomic volatility. The more recent rise in earnings yields is similarly reflective of an increase in the volatility of both inflation and growth during the current business cycle. The relationship between coincident economic volatility and financial asset risk premiums is a simple reflection of the extrapolative process by which we create a model of the future based on the recent past. Such mechanisms served us well when avoiding the multiple external threats of the African savannah. They are perhaps less useful when our own worst enemy is ourselves.

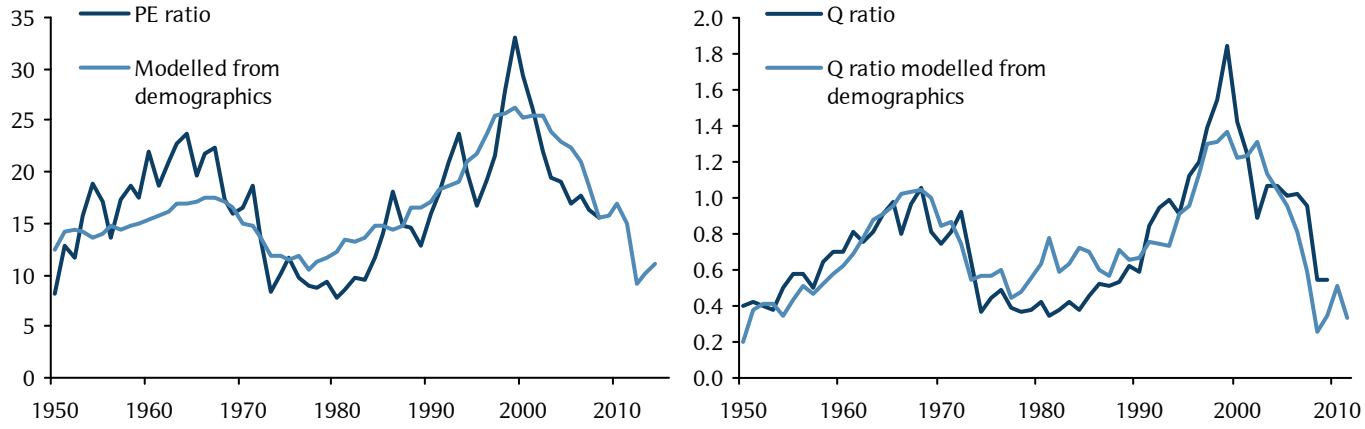
There is, however, an additional and perhaps more inexorable explanation for fluctuations in equity valuations. In past editions of the *Equity Gilt Study* we have highlighted the link between trends in financial asset yields and trends in demographics. In particular, fluctuations in the population cohorts of savers and the retired correlate strongly with bond yields and earnings yields. Thus when we observe the long run rhythm of financial asset yields, the ratio of the 35-55 year old population to the total population correlates negatively, while the growth rate of the newly retired population, which we define as 65-75 year olds, correlates positively. Indeed regression models in which the sole variables are these demographic components appear to explain long trends in stock and bond yields quite well. The same variables also explain changes in the Q ratio over time. Figure 8 and Figure 9 illustrate these points.

Figure 8: US and UK long-dated government bond yields, actual and modelled from demographics



Source: Barclays Capital

Figure 9: US trailing PE ratio and US Q-ratio, actual and modelled from demographics



Source: Wright, Barclays Capital

Unusually, the relationship between demographics and bond and stock yields conforms to both common sense and economic theory. A population in which the high savings age cohort is dominant will be characterised by a strong demand for financial assets. This demand will be reflected in higher-than-otherwise financial asset prices and lower-than-otherwise yields. Conversely, since the retired will typically be sellers of financial assets, a society in which the retired population is large or growing rapidly is likely to be characterised by a weaker demand for financial assets and hence higher-than-otherwise yields. The demonstrable correlation of financial asset yields with demographic trends supports the notion of the Lifecycle Theory of Savings writ large across the economy.

Speculatively, we might add the following rider. Bearing in mind the clear connection between inflation and financial asset yields, it is possible to infer a relationship between demographics and macroeconomic volatility. Certainly there is some logic to a link between the worker-dependent ratio and the propensity for inflation. After all, if globalisation is held to have been a restraining force on inflation over the past 20 years due to the expansion of the global labour force, it is reasonable to propose a similar effect from a natural expansion of a workforce due to demographic trends. Without wishing to belabour this point, we can surmise that growth in the baby-boomer working age population over the past three decades may well have been one of the factors keeping inflation in check. Similarly, as the baby-boom generation ages into retirement over the next decade, it is plausible to believe that the wage bargaining power of the remaining labour force will rise and that inflationary shocks might carry a greater risk of persistence.

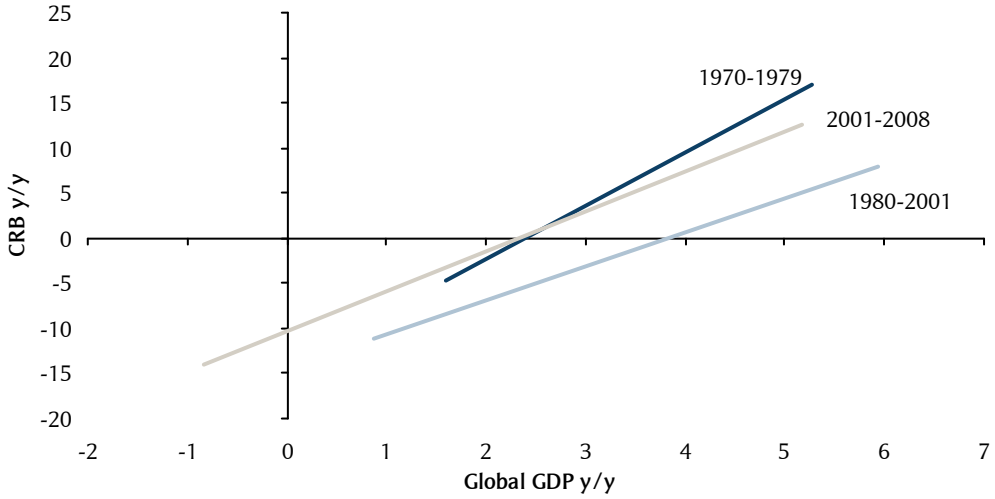
As far as financial assets are concerned, the growing demographic dominance of the high savings age cohort helps explain the rise in equity valuations during the 1990s. As the boomer generation entered their peak savings years, the competition for financial assets drove prices ever higher. It is particularly noteworthy that the US equity bubble peaked in the same year that the US high savers cohort peaked as a ratio to the general population. A similar timing was visible in early 1990s Japan. Meanwhile the subsequent move lower in valuations can be explained both by the pick-up in the growth of retirees and the decrease in the high savers-total population ratio.

For bond markets, demographic models expected a phase of very low nominal yields from the late 1990s onwards, but are now beginning to point towards a reversion to higher yields. Roughly, the demographic models expected bond yields to trough around a decade after equity yields. Such a time lag makes sense, since the demand for equities would be hit first by a fall in the ratio of high savers to the general population, whereas

the demand for bonds would be sustained – or even buoyed – as retirees shift into income-bearing assets. At a later point, the social security fiscal strains of an ageing population, along with the impact of a shrinking workforce on inflation and tax receipts, might be expected to be factors pushing bond yields higher. Looking forward, demographic trends would seem to point to an era of low equity valuations, accompanied by rising bond yields.

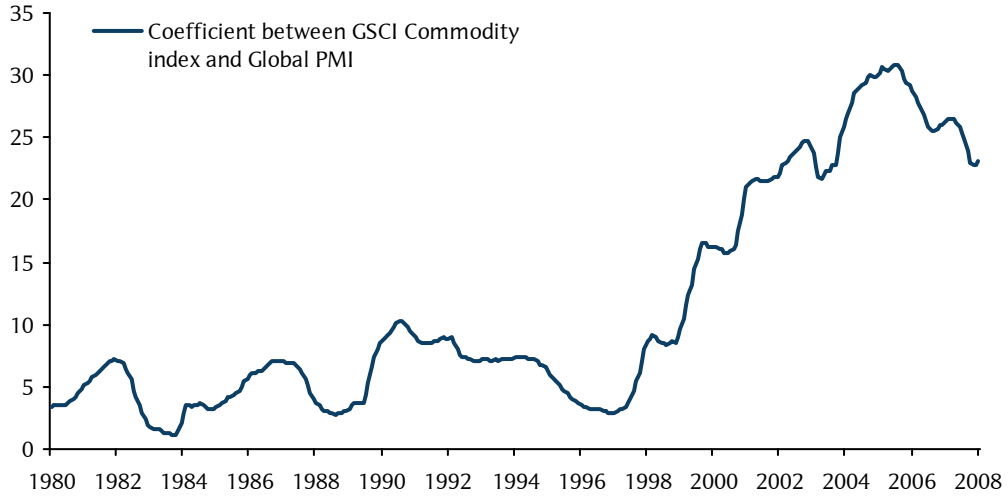
The apparent end of the Great Moderation in economic volatility conveys a similar message, as the world struggles to adapt to the emergence of giant developing economies. As Figure 10 and Figure 11 should hopefully illustrate, the relationship between global growth and raw material inflation shifted unfavourably during the current cycle. The primary cause was a severe demand shock, driven by the growing per capita resource appetites of the large developing economies and the greater raw material intensity of growth in industrialising economies. It was also clearly the case that a constrained response from the supply side failed to accommodate the leap in commodity demand. The weakness in the supply response is attributable to multiple causes, ranging from endemic scarcity, through environmental considerations, to under-investment. Our analysis of this topic is available in the past two years' editions of the *Equity Gilt Study*. Please see Chapter 1 of the *Equity Gilt Study 2008* and Chapter 1 of the *Equity Gilt Study 2007*

Figure 10: A shifting relationship between growth and inflation – trends in the correlation between global GDP growth and commodity price inflation



Source: Haver

Figure 11: A shifting relationship between growth and inflation – rolling 10-year coefficient between global manufacturing confidence and commodity prices



Source: Haver

In the most recent business cycle, the net boost to global inflation, prompted by the increased resource intensity of global growth, was sufficient to raise interest rates to levels that catalysed the asset price deflation and de-leveraging trends that are visible at present. An economic system whose levels of leverage and asset prices were predicated on endlessly low inflation proved to be unsustainable at the first whiff of higher inflation. In the short term, it is reasonable to believe that the de-leveraging of the private sectors in a number of over-extended economies will keep global demand – and hence inflation – weak. Over the longer run, it is difficult to evade the impression that this effect will fade and that the problem of accommodating the resource appetites of the developing world will re-emerge. As a consequence, the balance of probability seems tilted towards the persistence of high – in comparison to the last three decades – macroeconomic volatility.

Overall, both demographic and economic factors suggest that equity valuations may fall a little further and remain low for a while, before recovering later in the decade. Both factors also suggest that bond yields are likely to trend higher at the same time. However, of the two asset classes, we expect that equities are likely to reverse their long phase of underperformance against bonds. As far as bonds are concerned, rising yields will self-evidently damage returns. In contrast, as we have seen, lowly equity valuations tend to confer higher-than-average future long-run returns. This is both because a performance-damaging decline in valuations becomes less likely and because an eventual performance-enhancing rise in valuations becomes more likely, at low levels of valuation. Or, to put it rather more simply, equities are likely to outperform bonds over the next decade because equity yields are already high, whereas government bond yields have yet to rise. To summarise, we are in an environment in which forward-looking measures of equity risk premia should be high, compensating for a more risky macroeconomic environment and a reversal of the demographic forces that have supported asset prices in the recent past. If history is any guide, such a period should present long-term investors with an opportunity to gain cheap access to corporate profits and net worth.

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