Lombard Street Research Ltd.

Economic Analysis for the Institutional Investor

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A Long-Term Perspective on UK Equity Performance

What real rate of return should UK pension funds achieve in the long run?

The total real return to be achieved on UK equities in the long run depends on the initial dividend yield and the growth rate of real GDP. The reason is that the growth of real GDP drives the growth of dividends, which lies behind the achievement of capital gains. ***With the UK economy growing at about 2 1/2% a year in the long run and the average level of the dividend yield over the last 40 years at about 5%, the implied annual real return is at least 6 1/2%-7 1/2%.*** Since UK equities are the core asset for most UK pension funds, this is also roughly the return that pension funds might reasonably expect in the long run. If our argument is right, the real return targets typically set for pension funds - of 4%-4 1/2% a year - ought to be comfortably exceeded, which goes some way to explaining the so-called "problem" of pension fund surpluses.

Other key points

* Total returns on equities can be attributed to three factors: dividend receipts, dividend growth and changes in the dividend yield. Over one-year periods, changes in yield have the biggest impact. As the time horizon is extended, dividends and dividend growth become more important.

* The best five-year period for equities since 1955 was 1981-85, with average real returns of 15% a year. A fall in the dividend yield explains nearly half of this performance and real dividend growth a further 25%. Over 1986-90, real returns averaged 7% a year. This was entirely accounted for by rising real dividends.

* Historically, changes in the profit share of national income and the dividend payout ratio have had a significant influence on dividend growth. Both made positive contributions in the 1980s. The payout ratio rose extremely sharply over 1986-90, accounting for about 90% of real dividend growth over this period.

* The profit share is now close to its post-war average, suggesting that company earnings are unlikely to rise faster than nominal GDP over the long run. By contrast, the payout ratio stands at 0.41, against a post-1955 average of 0.28. Were this divergence to be eliminated over the next 10 years, dividends would grow by 4% a year less than earnings.

This paper was written by Professor Tim Congdon and Simon Ward.

Lombard Street Research

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What real rate of return should UK pension funds achieve in the long run?

A long-term perspective on UK equity performance

Purpose of the paper

One of the most important benchmarks for institutional investors is the real rate of return they can reasonably expect in the long run. This issue is of particular interest to pension funds, the great majority of which are required nowadays to pay pensions related to final salaries. Since inflation over the next 20 or 30 years is impossible to predict with any accuracy, holdings of gilt-edged or other fixed-interest securities are not altogether appropriate for matching pension liabilities. Instead the preferred approach has been to invest in assets which approximate to "real" things, such as equities and property, whose value ought to rise in line with inflation. UK equities represent 55% - 60% of most pension fund assets. Implicitly, the guidelines set by pension fund trustees to their fund managers are determined by expectations about the real rate of return that can be achieved on UK equities over periods of a few decades.

The purpose of this paper is to outline a simple model of real returns, in order to identify the determinants of likely "average" performance in UK equities. Of course, relative performance depends in part on asset allocation and, in particular, on the degree to which any individual fund departs from the industry norm in its equity proportion. But the focus on UK equities provides us with a way of thinking about the problem. According to our analysis, the real rate of return to be expected on UK equities in the long run is 6 1/2% - 7 1/2% a year.

Most pension fund trustees, guided by actuaries, set a target real rate of return a little higher than the projected long-run annual increase in real earnings, which is taken to be equal to the long-run increase in real gross domestic product at 2 1/2% - 3%. A common target real annual rate of return would therefore be 4% or 4 1/2%. The appropriate level of pension fund contributions is then calculated on the assumption that this target rate of return is met. If we are right that a more reasonable expectation of long-run real return is 6 1/2% - 7 1/2%, it should come as no surprise that pension funds in recent years have been consistently "over-funded" (i.e., they are projected to be able to more than cover the liabilities to their pensioners). Our analysis has a significant message for the size of companies' pension fund contributions.

I. A framework for analysis

The starting point for the analysis in this paper is the following decomposition of total returns on equities. All terms are in % p.a.:

Total returns = initial dividend yield + capital gain ***1.***

The capital gain can in turn be broken down into two elements. Suppose that the dividend on a share doubles, but that the yield basis (i.e., the dividend as a

% of the share price) remains unchanged. Then it is obvious that the share price also doubles. In general, if the yield basis is constant, the total rate of return is the dividend yield plus the growth rate of dividends. If the yield basis also changes, it consitutes a further influence on total return. Clearly, when the dividend yield halves with an unchanged dividend payout, a share price doubles. Capital gain therefore depends on the growth rate of dividends and the change in the dividend yield. (The simple algebra involved is set out in the appendix. There is a complication when both dividends grow and the yield varies. Because the two influences interact, the capital gain is only approximately equal to the sum of the two separate effects. The difference can be interpreted as the extra impact of any change in the yield, due to the fact that dividends have increased. It is not usually of any great importance in short periods of time, but can become so over the longer term. In this analysis it is included under the impact of yield changes.)

Our formula, all in % p.a., becomes:

Total rate of return = initial dividend yield + growth rate of dividend + fall in dividend yield ***2.***

What determines dividend growth?

Dividend growth for the market as a whole depends, of course, on profits of the quoted sector and the proportion of their profits that companies decide to pay out to their shareholders. One of the stylized facts about the UK economy is that, over the very long run, the ratio of profits to GDP tends to be stable. Economists have put together various hypotheses to explain this stylized fact, including conjectures that the relationship between inputs (of labour and capital) and output may be responsible. (For example, a characteristic of one particular input/output relationship - the Cobb-Douglas production function - is that the share of profits in GDP does not vary with changes in the relative amounts of labour and capital. If Cobb-Douglas technology were found in the real world, it would be consistent with the observed stability of the profits share.) But there is no space here to discuss the different theories. It will just be taken for granted that in the long run the profits/GDP ratio does not change very much. This is not to deny that there are large cyclical fluctuations in the profit/GDP ratio or that the ratio may vary quite markedly from one decade to another. The long-run stability of the profits share relates to periods of several decades, since it is this sort of time-horizon which is assumed to be relevant to judging the adequacy of pension funds' assets. (This assumption is discussed in more detail below, on p. 8.)

Once the long-run stability of the profits share is given, certain consequences follow. In particular, if the proportion of profits paid out in dividends (i.e., the payout ratio) is also constant, the growth rate of dividends should be equal to the growth rate of nominal GDP. Assuming that the dividend yield does not change, the return on UK equities should be governed by the following relationship (all in % p.a.)

Total nominal return = initial dividend yield + growth rate of nominal GDP **3.**

The key argument, after adjustment for inflation

But our main interest lies in the real, not nominal, return. It is easy to make the adjustment for inflation. The nominal return is the real return plus the inflation rate. Similarly, the growth rate of nominal GDP is the growth rate of real GDP plus the inflation rate. The inflation rate can be deducted from both sides of the relationship to give

Total real return = initial dividend yield + growth rate of real GDP **4.**

This is our key argument. We have here the two dominant determinants of long-run real returns. They can be discussed in turn.

In the very long run the growth rate of the British economy has been 2% - 2 1/2% a year. There have been variations around this figure, sometimes lasting several years, because of wars and occasional periods of productivity growth acceleration or deceleration. But the 2% - 2 1/2% number has undoubtedly been the long-run mean.

Over the 36-year period from 1955 to 1990 the average dividend yield on the Financial Times index of ordinary shares was 5.2%. With the dividend yield on the FT-Actuaries all-share index usually slightly higher than this, it seems reasonable to take the benchmark dividend yield as 5% - 5 1/2%. The implied total real returns in the long run from UK equities is 7% - 8% p.a. (i.e., 5% - 5 1/2% plus 2% - 2 1/2%). However, there are management costs in running a portfolio. These obviously vary with the size of the portfolio, but a figure of 1/2% p.a. is probably appropriate for most pension funds. It follows that the right long-run real return figure to expect is 6 1/2% - 7 1/2%.

Corroboration, at least in general terms, for our analytical approach comes fromthe annual *BZW Equity-Gilt Study*. This shows that the average annual real rate of return on UK equities, with gross income re-invested, was 7.2% over the 70 years to 1988. The corresponding numbers for the 60-year, 50-year, 40-year and 30-year periods to 1988 were 5.5%, 5.5%, 6.8% and 6.4%. Bearing in mind that the Second World War would have upset the 50-year and 40-year timespans, our conjecture of a 6 1/2%-7 1/2% long-run real return figure looks correct.

Some difficulties with our analysis

If our conclusion is right, target real returns for pension fund managers of 4% p.a. or 4 1/2% p.a. are too low. Where pension contributions have been based on this sort of number, there should be no surprise that in the 1980s pension funds have shown a systematic tendency to throw up surpluses. However, we need to point out some problems with our analysis. Some of them argue that the real return should be higher, but most of them that it should be lower.

Our analysis applies to the very long term. It does not deny that there can be periods of several years, even of a decade or more, in which equity prices are depressed. If a pension fund is forced to sell equities in such periods in order to cover liabilities, it may find that the total return achieved on its assets fails to match not only the 6 1/2% - 7 1/2% figure, but even the 4% - 4 1/2% target typically set by trustees. For reasons of safety, investment managers therefore like to hold a proportion of every fund in assets with more consistency and certainty about their value than equities. In periods of weak asset values, they can run these down rather than sell equities. The three main alternatives to equities are property, bonds (mostly, gilts in the UK context) and cash. Property is more difficult to buy and sell than equities, and its value is also quite volatile. So it does not provide greater stability than equities. In fact, pension funds on average require a higher return on property than on equities to offset its unfavourable characteristics, notably its poor liquidity and relatively high management costs.

The assets which protect pension funds in periods of depressed asset values are, of course, gilts and cash. But both of these have historically achieved lower real returns than equities. The explanation for the lower real return on gilts and cash is partly that the personal sector appreciates the certainty of nominal value provided by these assets. As a result it is prepared to hold them despite the poor return. Tax considerations are also relevant. For example, in the past rich individuals held low- coupon gilts because they offered certain capital gains, while capital gains tax was set at a lower rate than the top rates of income tax. This influence biassed real returns on gilts downwards relative to those on equities. The effect of including gilts and cash in pension fund portfolios has been to reduce the long-run real return beneath the 6 1/2% - 7 1/2% figure that could reasonably have been expected from a portfolio consisting 100% of equities.

Index-linked gilts uncomfortable in pension fund portfolios

The major issue raised here is whether index-linked gilts have any place in a pension fund portfolio. Their real return has typically been about 4% since their introduction in the early 1980s, much beneath the 6 1/2% - 7 1/2% long-run average to be expected on equities. Individuals may be happy to hold index-linked gilts because the favourable tax treatment more or less equalizes the expected post-tax return on them and equities. But it is difficult to see why any gross investor, such as a pension fund, would want to keep them. The only justification would appear to be that index-linked gilts are an alternative to cash, when investment managers are bearish about equities and property.

Against these points restricting returns, others are favourable. It may be wrong to relate the long-run growth rate of real dividends to that of the UK's GDP, because much of the UK quoted sector operates both in this country and abroad. With the long- run growth rate of world's GDP 1% - 2% higher than the UK's, the international orientation of UK companies may enable them to raise dividends faster than UK profits or GDP. Similarly, since 1979 UK pension funds have been able to invest overseas without restriction, making possible returns above (or lower than) those available in the UK market.

II. The relative size of the main influences on returns: an historical exercise

The next step is to use formula (2) to analyse the historical returns on equities, separating out the contributions of dividends, dividend growth and changes in yield. The results are shown in charts 1 and 2. Chart 1 plots returns over one-year periods, starting in 1955. Chart 2 shows returns over five-year periods, starting in 1959. From the early 1960s, the calculations are based on the FT-Actuaries all-share index. For the earlier period, the FT industrial ordinary 30-share index has been used. (There is a small series break where the two join. This occurs at the start of 1964 in chart 1 and at the start of 1968 in chart 2.)

Yield changes dominate one-year returns

Chart 1 on p.6 is very striking. It shows that changes in the dividend yield account for almost all of the variation in one-year returns. Predictably, dividend receipts make only a small, but very stable, contribution to performance. Dividend growth has had a significant impact in particular periods. For example, the large dividend increases over the last two years have helped to cushion the impact of a rise in the dividend yield. However, the implication of chart 1 is that investors with a one-year horizon should place greater emphasis on anticipating yield changes than forecasting dividend growth.

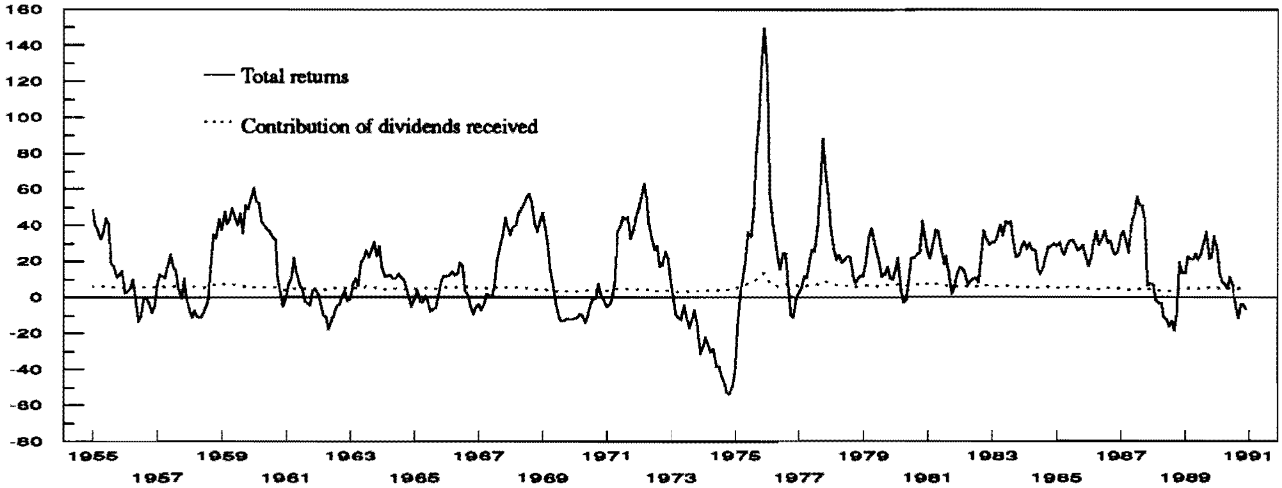
Dividend growth also important over five-year periods

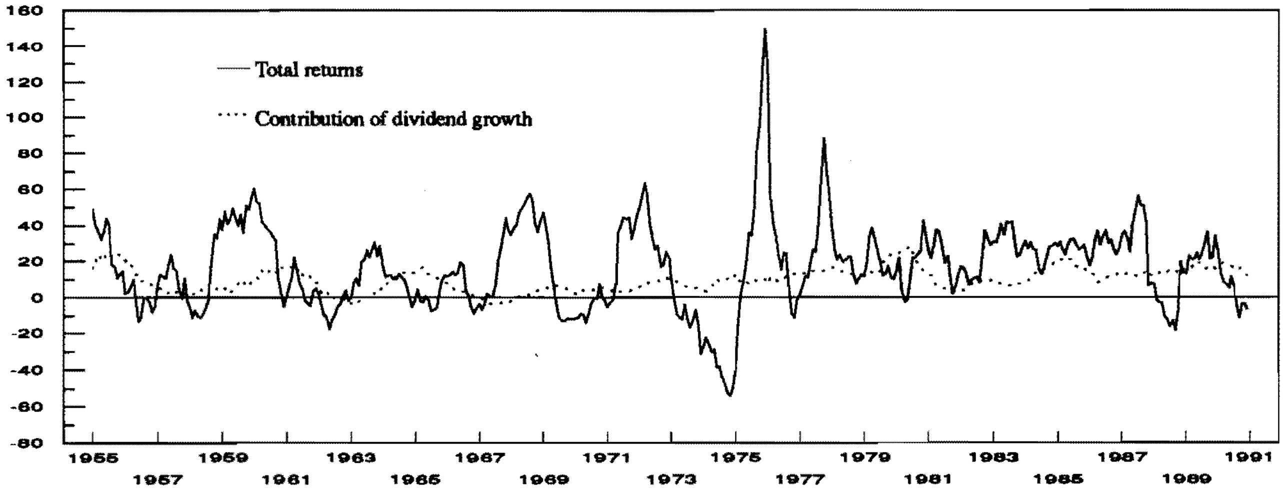
When the time horizon is extended to five years, the role of dividend growth becomes more important. Chart 2 shows that the exceptional equity performance of the 1980s was founded on a sustained high rate of increase of dividends. Dividend receipts also make a greater contribution to returns over five years. However, changes in yield still have a significant impact. This suggests that one familiar approximation - that, over the long run, equity returns will depend only on the dividend yield and dividend growth - needs to be treated with care. The "long run" here implies a period of decades, not years.

Late 1950s bull market followed by below-average returns in 1960s

The information in charts 1 and 2 is summarised in table 1, which shows the decomposition of total returns over five-year periods starting in 1956. During the late 1950s, equities performed well, particularly in real terms. This reflected a healthy rate of increase of dividends, coupled with a slight decline in yield. Dividend growth slowed progressively during the 1960s. With the dividend yield broadly stable over the decade, total returns - both nominal and real - were below their long-run average.

Chart 1 Total returns over one-year periods





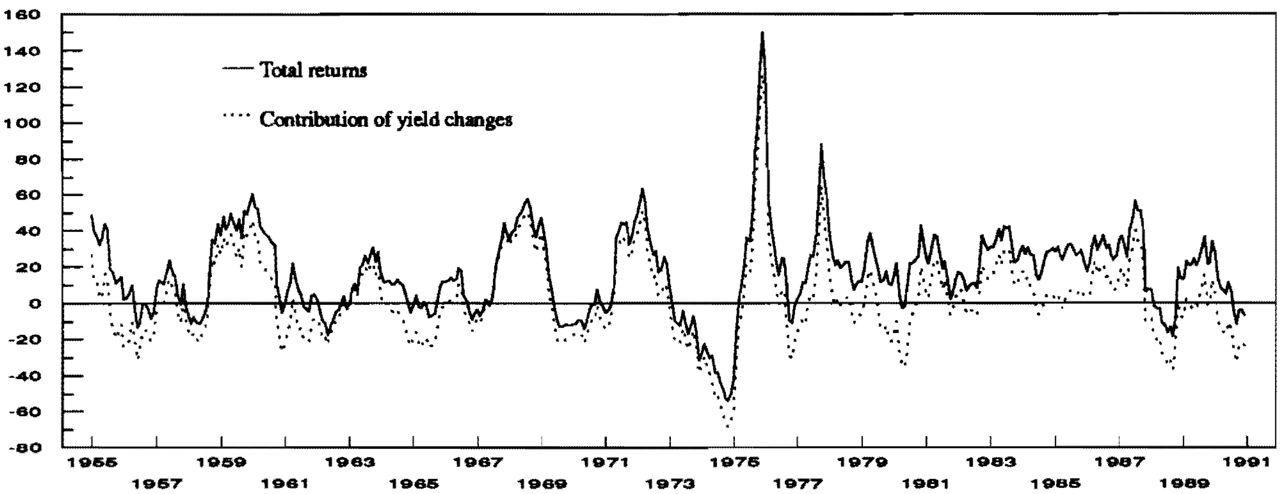
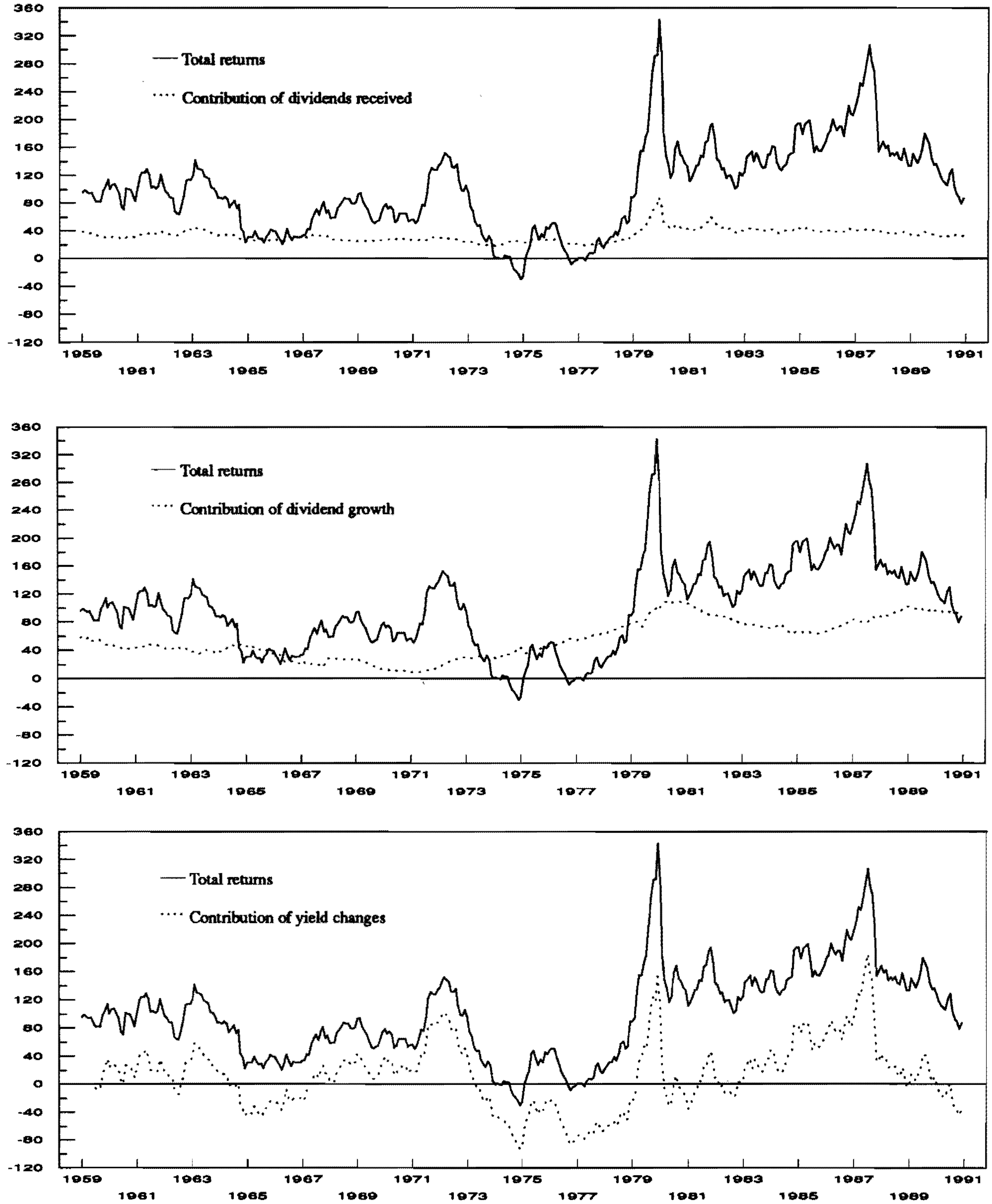


Chart 2 Total returns over five-year periods



Strong 1980s performance due to falling yield and rising dividend growth

The first half of the 1970s was a disastrous period for equity investors. Dividend growth fell far short of inflation, while the market yield rose sharply. Real returns were substantially negative. Nominal returns recovered significantly during the second half of the decade, with strong dividend growth offsetting a further rise in yield. However, real returns remained unimpressive. The first half of the 1980s saw the best equity performance of the whole period. The dividend yield fell from over 6% to less than 4.5%, while dividends grew well ahead of inflation. The decline in yield was partly reversed during the second half of the decade. However, an acceleration in dividend growth helped to sustain returns above their long-run average.

III. Can high dividend growth be sustained?

A key question for the 1990s is whether the recent strong performance of dividends will now be counterbalanced by a period of average or below-average growth. In order to answer this, it is necessary to explain why dividends grew so rapidly in the late 1980s. To shed some light on this issue, we have used the same approach as applied to total returns to examine the contributions of various factors to past dividend growth. This is based on the following accounting relationship:

$$\begin{aligned} \textit{Dividends} &= \textit{company earnings} \times \textit{payout ratio} \\ &= \textit{nominal GDP} \times \textit{earnings to GDP ratio} \times \textit{payout ratio} \\ &= \textit{prices} \times \textit{real GDP} \times \textit{earnings to GDP ratio} \times \textit{payout ratio} \qquad \textbf{5.} \end{aligned}$$

This means that past dividend growth can be separated into four elements - inflation; real GDP growth; changes in the earnings to GDP ratio; and changes in the payout ratio. (The algebra behind the decomposition is set out in the appendix.)

Decomposition of dividend growth based on national accounts data

We encountered a problem in applying this approach. Unfortunately, there are no figures readily available on the aggregate earnings of companies included in the FT-Actuaries all- share index. An alternative would have been to base the decomposition on the 500-share index, for which earnings as well as dividend figures are published. However, this information is only available for part of the period. Moreover, there have been various changes to the definition of earnings which create problems in making long-term comparisons.

We were therefore forced to use national accounts data. This means that the figures in table 2 are not comparable with those in table 1, although they show similar variations over time. The figures cover all industrial, commercial and financial companies. Distributable earnings are given by undistributed income less stock appreciation plus actual dividend payments (including ACT after 1973).

Chart 3 Share of company earnings in GDP

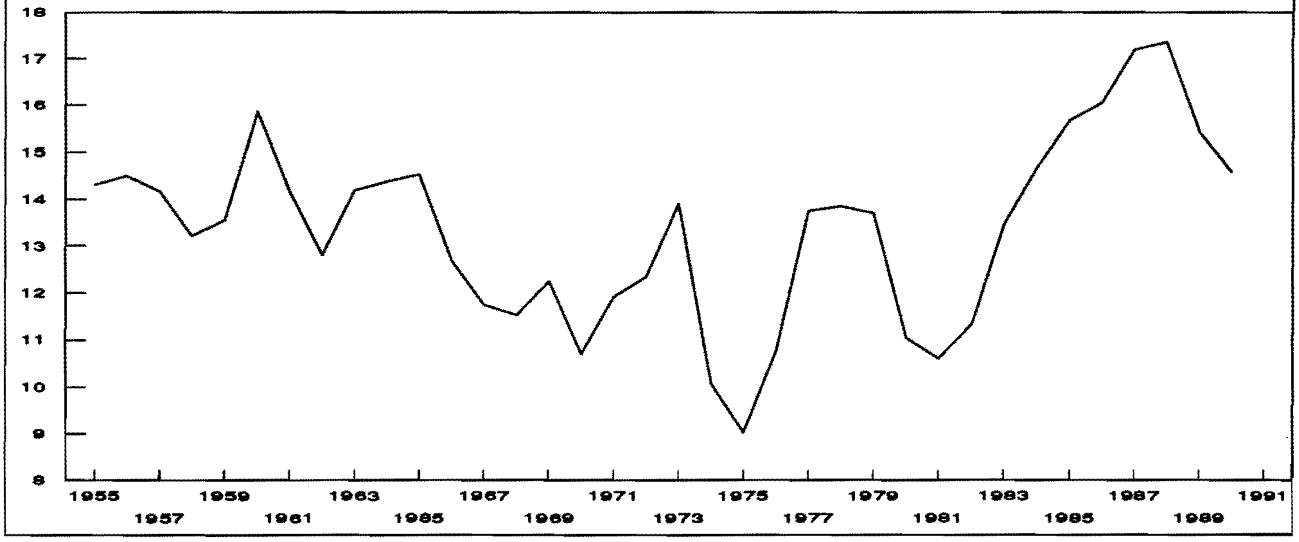
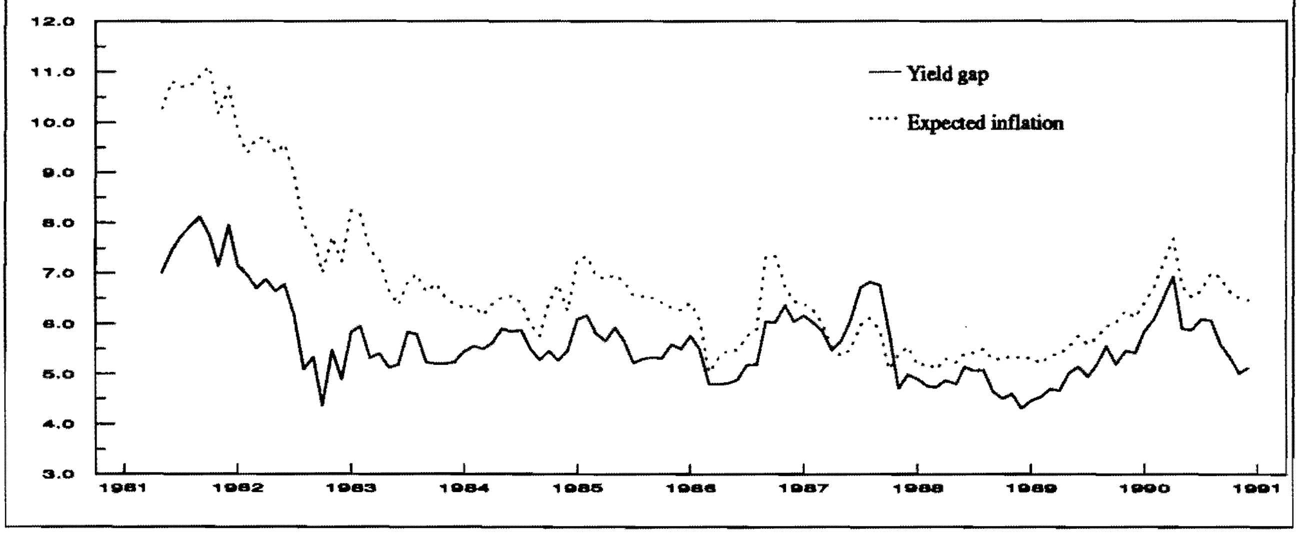


Table 1 Total returns on equities over five-year periods

	Total returns	Due to: Dividends	Dividend growth	Change in yield	Memo: Real returns
1956-60	82.6	30.3	43.4	9.0	54.9
1961-65	39.0	27.7	34.4	-23.2	19.1
1966-70	56.0	27.0	10.3	18.7	24.4
1971-75	43.0	27.5	44.1	-28.6	-29.5
1976-80	133.3	43.6	106.7	-17.0	21.6
1981-85	170.0	39.6	66.1	64.3	103.5
1986-90	87.1	32.8	90.4	-36.2	38.5
Average	87.3	32.6	56.5	-1.9	33.2

Figures are based on FT 30-share index before 1966 and FTA all-share index thereafter. Real returns are calculated using the GDP deflator.

Chart 4 Nominal yield gap and expected inflation



Dividend growth higher on national accounts basis

(Comparison of tables 1 and 2 shows that dividend growth has been consistently higher on a national accounts basis, averaging 11.8% a year over 1965-90, compared with 9.8% according to the all- share index. The main reason for the discrepancy is that the all- share series represents the behaviour of the "average" quoted company, whereas the national accounts figures refer to companies in aggregate. The national accounts definition will usually grow faster simply because the number of firms in existence tends to increase over time. In addition, it includes unquoted companies, which may have experienced stronger earnings and dividend growth than quoted firms.)

Table 2 Dividend growth over five-year periods

	Dividend growth	Due to: Inflation	GNP growth	Change in earnings/GDP share	Change in payout ratio
1956-60	105.4	19.6	15.6	14.9	55.3
1961-65	63.0	17.0	20.7	-11.8	37.1
1966-70	-12.1	23.0	16.8	-36.7	-15.1
1971-75	51.5	96.6	18.9	-33.7	-30.2
1976-80	135.9	92.7	17.3	46.7	-20.9
1981-85	96.6	38.3	14.7	64.5	-20.9
1986-90	160.8	31.8	21.6	-10.6	118.0
Average	85.9	45.6	17.9	4.8	17.6

Figures for dividend growth are taken from the National Accounts and differ from those in table 1. Earnings = undistributed income less stock appreciation plus gross dividend payments. Figures cover all industrial, commercial and financial companies.

1958 tax reform encouraged firms to boost payout ratio

Table 2 shows that changes in the share of company earnings in GDP and in the dividend payout ratio have had a significant impact on variations in dividend growth. These two series are graphed in charts 3 and 5. The payout ratio was very low in the mid-1950s, partly reflecting the lingering impact of wartime controls. During the second half of the decade it rose steadily, giving a major boost to dividend growth. A contributory factor was the abolition in 1958 of the two-tier system of profits tax, under which distributed earnings were taxed at a higher rate than retentions. There was also a slight increase in the share of earnings in GDP during this period.

Dividend growth weak in 1960s, with both profit share and payout ratio falling

The payout ratio continued to rise during the first half of the 1960s, reaching nearly 0.40 by the middle of the decade. However, dividend growth slowed as the earnings share of GDP started to decline. In 1965, a "classical" system of corporation tax was introduced, with companies paying tax on profits and shareholders also paying the full rate of income tax on dividend receipts. This system involved the double taxation of dividends and provided an incentive for companies to reduce the payout ratio. Coupled with a further fall in the earnings share of GDP, this resulted in a very poor dividend performance during the second half of the 1960s.

Dividend controls contributed to further decline in payout ratio in 1970s

Growing labour militancy and sharp rises in oil and other commodity prices put further pressure on company profitability during the first half of the 1970s. The payout ratio continued to fall. Although the introduction of an imputation system of corporation tax in 1973 gave companies a greater incentive to distribute profits, their ability to do so was limited by the imposition of statutory controls on dividends. Dividend growth fell far short of inflation in this period. There was a significant recovery during the second half of the decade, mainly reflecting a rebound in the earnings share of GDP from the very depressed level reached in 1975. The payout ratio continued to have a negative impact on dividend growth, but was rising by the end of the period. The incoming Conservative government abolished controls on dividend payments in 1979.

Profit share and payout ratio rose to new peaks in 1980s

The early 1980s were a period of reconstruction for company finances. The earnings share of GDP rose sharply and by the middle of the decade was above its long-run average. Somewhat surprisingly, companies reduced the payout ratio during this period, despite a relatively favourable tax regime and the absence of controls. Nevertheless, dividends still grew well ahead of inflation. The boom of 1987-88 resulted in a further increase in company profits, but this has been reversed over the last two years, with the earnings share of GDP now close to its post-war average. The striking feature of the late 1980s was a very steep rise in the payout ratio. This appears to have been related to the sharp increase in hostile takeover activity that occurred between 1986 and 1989. A further influence may have been the equalisation of income and capital gains tax rates in the 1988 Budget, which made retentions less attractive for higher-rate taxpayers. Real dividend growth during the second half of the 1980s was the highest of the whole period.

Dividends must grow now less than nominal GDP to re-establish normal relationships

What are the implications of the current levels of the earnings to GDP and payout ratios for dividend prospects in the 1990s? Suppose that in the long run both ratios stabilise around their averages for the last 35 years. Two conclusions would then follow. First, since the earnings share of GDP is now close to its long-term average, earnings would rise approximately in line with nominal GDP. Secondly, dividends would grow by less than earnings, since the current payout ratio of over 0.40 is well above the 35-year average of 0.28. If the discrepancy were eliminated over 10 years, dividends would have to grow by 4% a year less than earnings during this period.

Profit share relatively stable over long periods

Is the assumption that these ratios revert to their long-run averages justified? Take first the earnings to GDP ratio. Economic theory indicates that in equilibrium the share of profits in national income should equal the elasticity of output with respect to capital. More specifically, if a 1% increase in capital input boosts output by 0.25%, the profit share should settle at 25%. In one model (the Cobb-Douglas production function), the capital elasticity of output depends only on the state of technology. It will also be affected in general by the relative amounts of capital and labour used in production. The key point is that the profit share should be stable unless there is a change in either the relative availability of capital or its usefulness in production. Chart 3 shows little sign of a persistent trend in the earnings to GDP ratio over the last 35 years, which is consistent with evidence for other countries and covering a longer period.

Theory provides little guidance about "optimal" payout ratio

The payout ratio is more problematic. One academic theory (the "Modigliani-Miller irrelevance hypothesis") argues that, in the absence of tax distortions, firms and shareholders will be indifferent to the level of the payout. The reasoning is that shareholders' net worth is the same whether a company finances its investment plans entirely from retentions or distributes 100% of earnings and raises new money through rights issues or borrowing. In practice, however, shareholders undoubtedly like some cash coming in from an

Chart 5 Dividend payout ratio

investment and are reassured if a company steadily makes a dividend payment. The whole subject is unsettled and provides little worthwhile guidance to dividend behaviour.

The surprising feature of the late 1980s was that the large increase in the payout ratio was accompanied by a relatively small rise in the dividend yield, with the result that real equity returns were well above their long-term average. One explanation is that investors misinterpreted the rise in dividends as due to an increase in profitability (i.e., a rise in the earnings share of GDP) rather than a higher payout. An alternative is that, for a variety of possible reasons, investors would like to receive a higher proportion of their total return as current income. (For tax-exempt institutions, one reason would be that ACT can be partially reclaimed when profits are distributed, increasing the total return.) When a company raises its payout, its share price will then be marked down by less than justified by the consequent deterioration in earnings potential.

Further rise in payout ratio might put upward pressure on dividend yield

If the second explanation is correct, companies could increase the payout ratio even further during the 1990s, pleasing their shareholders and boosting their share performance. However, in practice there may be a limit on how much further the ratio can rise. Managers will be reluctant to increase the payout if this involves scaling back investment plans. An alternative would be to finance a higher proportion of investment by borrowing, but company balance sheets already look very weak by historical standards and lenders are likely to be unwilling to allow gearing to increase further. This leaves rights issues as a possible source of finance. However, if increased dividend payments were financed simply by expanding the supply of shares, it is difficult to envisage much of a positive impact on share prices.

IV. Poor dividend prospects in the 1990s

This discussion suggests that dividend growth in the 1990s will be disappointing by recent standards. Company earnings are unlikely to rise by more than nominal GDP, while dividends could grow more slowly if the payout ratio reverts to its long-run average. A higher dividend growth rate could be sustained if firms increased the payout ratio further. However, this would involve cutting investment or increasing rights issues, both of which would be likely to put upward pressure on yields, offsetting the impact of higher dividends on returns. With dividend growth constrained, above-average returns on equities will only be possible if there is a decline in the dividend yield.

The conclusion can be made more vivid if we suggest some arithmetic on the likely total returns from equities in the next few years. The Government joined the exchange rate mechanism of the EMS in October 1990 with the intention of bringing inflation down to the lowest European levels. The implied inflation figure is presumably 2% or 3% a year, the sort of number achieved with a fair degree of regularity in West Germany in the late 1980s. Our view, set out in the April *Quarterly UK Economic Forecast*, is that the inflation objective will be achieved by late 1992 or early 1993, although at the cost of a fall of about 2 1/2% in GDP in 1991 and growth in 1992 of under 2%. Over the early and mid-1990s as a whole GDP growth will probably average about 2 1/2% a year. This would be somewhat less than in the mid- and late 1980s because there is less scope for efficiency gains in industries, such as cars, steel and coal, which were grossly under-managed in 1979. (See the paper 'Potential output and the natural rate of unemployment in the UK' in the March 1991 *Gerrard & National Monthly Economic Review*.)

Dividend growth to average 2%-5% a year in early and mid-1990s

It follows that the rate of increase in nominal GDP in the early and mid-1990s should be about 4% - 6% a year (i.e., inflation of 2% - 3% plus real GDP growth of 2% - 3%). If we are right that dividends will tend to increase more slowly than nominal GDP, dividend growth might average a mere 2% - 5% a year. This contrasts markedly with a typical annual increase of 12 1/2% - 15% since the mid-1970s. Of course, the investment environment would change radically if dividend growth were to run at under 5% a year. The suggestion that it might be so low may seem startling, as well as unwelcome. But it is difficult to see how the conclusion can be avoided. Pressures on company finances and the current high payout ratio argue that dividend growth must be beneath the growth of nominal GDP; the UK's membership of the ERM, as well as announced government policy, point to nominal GDP growth much lower than in the 1970s and 1980s, and more like that seen in the 1950s and1960s.

Suppose that the dividend yield on the FT-Actuaries all-share index were to remain at its present value of 4.7%. Then total nominal returns would be 6 1/2% - 10% a year (i.e., the dividend yield of 4.7%, plus the dividend growth rate). It is striking that this figure is similar to both gilt yields and the average yield now provided by property. If there were to be a fall in gilt yields because of lower inflation and rental growth plus an improved valuation basis for property, equities would underperform both gilts and property.

The only way to avoid this conclusion would be for the dividend yield on equities to fall further. The dividend yield on the FT- Actuaries all-share index was indeed under 4 1/2% for extended periods in the 1980s, notably from early 1986 to mid-1988 and then again for much of 1989. But, on the whole, buying equities in the late 1980s at those times when the dividend yield was under 4 1/4% was either a downright bad idea or one which so far has given returns similar to those in cash.

Equities likely to underperform other asset categories

The analysis in this paper should not be misinterpreted. Many of the background conditions for a bull market in equities (falling interest rates, the beginnings of an improvement in company finances, lower inflation) are still in place. A standard pattern is for peaks in equity markets to coincide with the inflation trough in the early boom phase of the business cycle. That is still many quarters away, perhaps sometime in late 1993 or 1994. But the warning must nevertheless be given that, with prospects for dividend growth in the 1990s much poorer than in the 1980s, an equity market on the current yield basis is unlikely to beat other asset classes over the medium term. Indeed, if equities were to perform well for a time with the yield falling under 4 1/4%, all past experience suggests that they would then become a straight "sell".

Appendix

(1) Decomposition of total returns

Let P_0, P_t = share price index at years 0 and t,

d_0, d_t = dividend yield at years 0 and t,

D_0, D_t = dividends at years 0 and t,

g = growth of dividends between years 0 and t.

Total returns between years 0 and t

$= (D_1 + D_2 .. + D_t)/P_0 + (P_t/P_0 - 1)$

Now $(P_t/P_0 - 1)$

$= (D_t/d_t)/(D_0/d_0) - 1$

$= (1 + g) \times (d_0/d_t) - 1$

$= g + (1 + g) \times (d_0/d_t - 1)$

So total returns

$= (D_1 + D_2 .. + D_t)/P_0 + g + (1 + g) \times (d_0/d_t - 1)$

which is the formula used for the decomposition.

$(D_1 + D_2 .. + D_t)/P_0$ = dividends received,

g = dividend growth,

$(1 + g) \times (d_0/d_t - 1)$ = contribution of change in yield.

(2) Decomposition of dividend growth

Let p_0, p_t = GDP deflator at years 0 and t,

e_0, e_t = company earnings at years 0 and t,

Y_0, Y_t = nominal GDP at years 0 and t,

y_0, y_t = real GDP at years 0 and t,

a_0, a_t = dividend payout ratio at years 0 and t,

b_0, b_t = company earnings to GDP ratio at years 0 and t.

Dividend growth between years 0 and t

$= (a_t \times e_t)/(a_0 \times e_0) - 1$

$= e_t/e_0 + e_t/e_0 \times (a_t/a_0 - 1) - 1$

$= (b_t \times Y_t)/(b_0 \times Y_0) + e_t/e_0 \times (a_t/a_0 - 1) - 1$

$= Y_t/Y_0 + Y_t/Y_0(b_t/b_0 - 1) + e_t/e_0 \times (a_t/a_0 - 1) - 1$

$= (p_t \times y_t)/(p_0/y_0) + Y_t/Y_0 \times (b_t/b_0 - 1) + e_t/e_0 \times (a_t/a_0 - 1) - 1$

$= (p_t/p_0 - 1) + p_t/p_0 \times (y_t/y_0 - 1) + Y_t/Y_0 \times (b_t/b_0 - 1) + e_t/e_0 \times (a_t/a_0 - 1)$

which is the formula used for the decomposition.

$(p_t/p_0 - 1)$ = inflation,

$p_t/p_0 \times (y_t/y_0 - 1)$ = contribution of real GDP growth,

$Y_t/Y_0 \times (b_t/b_0 - 1)$ = contribution of change in earnings to GDP ratio,

$e_t/e_0 \times (a_t/a_0 - 1)$ = contribution of change in payout ratio.