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Explaining Victorian Entrepreneurship: A Cultural Problem? A Market Problem? No Problem?

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1. Introduction

The quality of British entrepreneurship in the half century before 1914 excites controversy. Contemporaries were of mixed minds about the matter. Alfred Marshall (1920: 92-106), for example, was uneasy about the competitive inroads entrepreneurs from other advanced industrial countries had made into British markets, yet did not pinpoint an obvious cause of the problem, nor propose an immediate response. With increasing frequency, more popular, but less cautious and less reflective, expressions of concern erupted in books and national newspapers, with titles such as *Made in Germany* (1896), *American Invaders* (1902), and, in *The Times* (1902), "Crisis in British Industry". In contrast, many contemporaries took solace from Britain's undeniable wealth – in per capita terms the richest country in Europe by a comfortable margin throughout the period – and from the formidable export capacity of large and important industries ranging form shipbuilding to cotton spinning to financial services. Subsequent observers have echoed these opposing views. In the 1960s, Derek Aldcroft (1964, 1968) recast the debate within the context of Britain's long run economic growth performance, emphasizing perceived failures deemed to have become more damaging with the passage of time. David Landes (1969) concurred, noting that a culture where managers "worked at play and played at work" was unlikely to foster good economic performance. Variants of Landes' arguments were supported by Donald Coleman (1973) and, in an influential book-length treatment, by Martin Wiener (1981).

These views, however, no more went unchallenged than their earlier counterparts had. In particular, Donald McCloskey and a group of like-minded collaborators stressed the open, competitive nature of Britain's markets of the period, encumbered neither by misguided and heavy-handed government fiat nor by successful monopolists and cartels, the most likely causes of under-performance. And they drew the persuasive neo-classical conclusion that such an environment could hardly sustain incompetence on any significant scale. Given its position of front runner, in their view Britain fully exploited the opportunities of the age: the Victorians left no big bills lying on the sidewalk (McCloskey: 1971). More recently, S. N. Broadberry (1997) has concurred with this view, noting the long-term stability of Britain's productivity performance benchmarked against

international norms and arguing that British entrepreneurs of the period responded rationally to the resource and technological environment in which they operated.

And so the arguments continue. There is more evidence on all sides - examples and counter-examples abound - but consensus seems as remote as ever. While this debate has obvious implications for the analysis of Britain's own long-term economic performance, in particular the extent to which the problems of the twentieth century were foreshadowed before 1914, the ramifications are considerably broader. Perhaps most importantly, the decades from the middle of the nineteenth century to the outbreak of the First World War saw the first emergence of science-based industry, an important new development for long-term economic growth, since scientific understanding is not obviously subject to diminishing returns (or at least not to the same degree as other kinds of capital accumulation). The current role of the science and engineering departments of universities in the creation of rapidly growing, technologically advanced companies amply attests to the significance of this development. While it is now universally acknowledged that scientific understanding is an essential driver of technological advance, itself the basis of economic growth, that awareness was, although certainly present, less much less complete then than it has become since. Hence great importance attaches to how the first science-based industries (most notably chemicals and electrical engineering) became established and evolved in their early stages, when their significance was less obvious. Such knowledge may enhance the effective fostering of future industries capable of playing a similarly disproportionate role in initiating and sustaining growth.

The effective commitment of resources to such industries in their embryonic stages is clearly a key issue. In particular, was the nature of early science-based innovation one whereby initial success solved all financing problems, rendering access to external finance a relatively unimportant detail in the story? Or, alternatively, was access to external finance of critical importance, both in determining the fortunes of first movers and in determining the subsequent contestability of the markets in which they operated? Because Britain had then by far the world's most advanced capital markets, of unparalleled depth and breadth, involved closely in a range of activities that spanned the globe, Britain's experience with early science-based industries promises to be particularly revealing.

Nowhere else did investors have the same diversity of choice in arranging their portfolios, nor the same depth of financial intermediaries to help them do it. The same arguments apply to more traditional forms of technological advance. After all, important technologies like motor transport arose and flourished during the period, while owing much less to scientific advances than to the traditional practical engineering skills that had underpinned the classical Industrial Revolution. How did these industries establish themselves? What role did finance play? And all these issues played themselves out in an international economic environment of unparalleled flexibility. Together trade, capital, and people then flowed across national frontiers with a freedom unseen before or since, creating both literally and figuratively the golden age of "globalization" (Williamson, 1996). In terms of economic environment, the beginning of the twenty-first century more closely resembles the end of the nineteenth than most of the years in between.

This paper seeks to bring fresh evidence to the debate over Victorian entrepreneurship, and to the wider issues that debate touches, by taking advantage of the information generated within Britain's sophisticated financial markets of the period. In particular, it exploits the equity valuations generated by the London Stock Exchange to observe how British entrepreneurship was priced. To what extent did Britain get the entrepreneurs its sophisticated financial markets were willing and able to pay for? The new evidence consists of data on Britain's largest companies (measured by the market capitalization of ordinary shares). While Michael Edelstein's pioneering exploration (1976, 1982) of some of this data provides glimpses of valuations across companies and over time, it excluded four key features needed for adequate examination.

First, Edelstein intentionally made no effort to track the number of the securities outstanding for each company within his sample, on the very understandable grounds of the time-consuming complexity such detail involved. But without the number of securities outstanding, it is not possible to calculate a company's market capitalization. Edelstein thus had no consistently reliable way of knowing the relative sizes of the companies in his sample, and thus no way of knowing the relative significance of growth across companies. The data here fill that gap (and also, unlike Edelstein's data, hold out the prospect of permitting construction of a value weighted stock exchange index along FTSE 100 and

S&P 500 lines, although that task is not attempted here). The data here also record the scale and timing of new issues, so that recourse to external finance can be observed. Secondly, although Edelstein included all classes of traded securities (ordinary shares, preference shares, and debentures) in his studies, he did not link them to give a company-wide overview. The data here do that, so that total market capitalization can be calculated, yielding, among other things, gearing ratios, giving additional insight into security price movements (not least the degree to which equity valuations responded, for example, to fresh debenture issues). Thirdly, for ease of computation, Edelstein reported only total returns, conflating security price appreciation (or depreciation, as the case may be) with dividend and interest payments. The data here keep these two components of total return separated, treatment that, as we shall see below, is necessary for calculating risk premiums. The separate dividend and interest data also permit calculation of the total financial flows from companies to the holders of traded securities, flows that can be compared to inward flows from new issues to yield more precise measures of financial profitability. For example, a sustained dividend increase of 10% is much more impressive in terms of cash flow when the number of shares outstanding has also doubled than when the number has remained constant. Similarly the frequency of a company's recourse to external finance, and the impact of new issues on the price of outstanding shares, reveals much about contemporary perceptions of a company and its prospects. Finally, the data here generate a sample defined on the clear-cut basis of size at five-year intervals, rather than the looser criterion of subjective evaluations of "quality" employed by Edelstein. One of the consequences of his procedure was to exclude form his data base (but not from his discussion of results) international mining companies, a group that, in terms of the pricing of entrepreneurship, was intriguingly atypical of British companies generally.[1]

[1] Edelstein's procedures dictated the exclusion of international mining companies. Edelstein used the realized returns of sample companies to indicate the intrinsic profitability of the sector from which the sample company was drawn. Had that procedure been applied to international mining companies, it would have generated seriously misleading results. The realized profitability of successful companies (which of course met his selection criterion) was so great that they dominated portfolio choice. But obviously *ex ante* investors could not know which ventures would be successful and which not. This dilemma could be resolved by resort to some kind of random sampling procedure, which would introduce

The second section of the paper briefly describes this new data. The third sets out the Dividend Discount Model (DDM) used to extract estimates of risk premiums from the data. The fourth section provides estimates of benchmark Victorian risk premiums, first for the large capitalization corporate (large-cap) sector as a whole, then for railways, the largest single sector of the Victorian corporate economy. The fifth section presents estimates of risk premiums for two successfully expanding high-risk sectors: science-based companies and mining ventures. The science-based sector was much smaller than the mining one and its experience is examined by detailed consideration of Brunner, Mond, by far the most financially successful company in this group. A sole mining venture (Tharsis Copper and Sulphur) first entered the benchmark rankings of Britain's largest companies in 1873. Subsequently, however, the sector grew with extraordinary rapidity, to reach a peak of importance of 16.7% of the ordinary share market capitalization of Britain's 125 largest companies in 1903. Both Brunner, Mond and the mining sector exhibited risk premiums that were far above the average for the large-cap corporate sector as a whole. Consequently, in terms of the logic of the DDM, both their current dividend and expected dividend growth were valued at a discount to the market as a whole, resulting in a relatively low share price given their capacity for above-average dividend yield and growth rate. Depending upon exactly how the rapid entry and exit of mining ventures from the ranks of Britain's largest companies are treated, it is possible to argue that mining ventures actually had lower risk premiums than science-based companies. That is, entrepreneurial efforts in mining were possibly more generously and supportively priced than in chemistry. A final section concludes with a few observations on the factors operating within capital markets that might explain this cross-sectional pattern of risk premiums.

2. The Data

to the data he used the same uncertainty investors faced, but which would also be different from the selection procedure used for all other sectors. In the end he opted for a different treatment of the international mining sector in which he drew on other sources to arrive at an average return of 5%, a reasonable figure in itself, but one which concealed the huge variance in experience.

The data are as follows: (1) the market value of the ordinary shares of Britain's 125 largest companies at benchmark dates at five-year intervals, beginning in 1868 and ending in 1913 (as measured by ordinary share market capitalizations); (2) the dividends paid by these large companies; (3) the total market capitalizations of these companies (i.e. the market value of all traded securities, fixed interest as well as equities). [2] Tables 1 through 4 illustrate the data for the close of the last trading day of June for four years – 1868, 1883, 1898, and 1913. Column (2) shows for each company the market value of ordinary shares outstanding, the basis of the rankings. The total was arrived at in the obvious manner: the closing mid-market price (average of bid-ask) per share on the indicated day, multiplied by the number of shares outstanding. Column (3) reports analogous calculations for debentures (if any). Column (1) reports the sum of Cols. (2) and (3), plus the market capitalization of any preference shares outstanding. All traded securities were allocated to one or another of the categories, so that Column (1) represents total market capitalization. The last column, headed "dividend rate of return at market," is the total cash dividend paid on ordinary shares in the twelve months ending on the last trading day of June of the indicated year, divided by the closing market value on that day of all outstanding ordinary shares (given in Col. (2)). It follows for any given company that multiplication of Col. (2) by the dividend rate yields the cash dividend paid in the twelve months to the end of the indicated June. For example, the data imply that Britain's largest railway at end-June 1883, the London and North-Western, paid out £2.839m in dividends between end-June 1882 and end-June 1883, while the Bank of England paid out £1.530m.

The price data have been gathered from *The Investors'Monthly Manual (IMM)*, a sister publication of the influential *Economist* magazine. The data have been gathered from the *IMM* because it was considered to be the most authoritative source of security price information available to the Victorians themselves, as well as offering the most convenient format to process, due to its comprehensive coverage of securities presented in a uniform manner. The *IMM* did not routinely report the prices of all securities traded in Britain, but only those traded reasonably frequently on the London Stock Exchange. Thus

[2] Thus 10 benchmark years (listed in Table 5) are covered by this paper. An eleventh benchmark has also been made for 1918, but that data is not discussed here.

securities traded only on one or another of Britain's provincial exchanges are not considered until they were quoted (and traded) in London as well. While this procedure is not suitable for all investigations, it is unlikely to omit the large companies that are the focus here. [3]

While the *IMM* provided dividend and capital structure data as well as prices, *The Stock Exchange Official Yearbook* was the preferred source for such non-price information. As its name implies, the *Yearbook* appeared annually and was often more accurate (and timely) in its reporting of dividends and new issues than was the *IMM*. While the *IMM* eventually became current in its reporting of dividends and capital changes, there frequently were lags in doing so. Price data from the *IMM* was entered into a database by means of a Kurzweil scanner. This data, in a uniform format, with prices and security quantities appearing in designated columns, was then processed in order to determine market valuations. A by-product of this procedure was that it also produced the market capitalizations of all sterling-priced, London-quoted companies, thereby permitting a comparison of the market capitalizations of the top 125 with all sterling-priced, London-quoted companies. (See Table 5.) Although the *IMM*'s treatment of British- and foreign-quoted firms varied over time (with a particular discontinuity between 1888 and 1893, [see note to Table 5]), causing the relative proportion of the top 125 companies to all quoted "British" companies also to vary, the ratio (on a consistent definition) appeared to be fairly stable at around 60%.

The basic benchmark-year data can also be arranged to display change over time more explicitly. This alternative display is illustrated in Table 6. The objective here is to present the changes in market capitalization (and other key financial variables) of the top 125 companies between 1898 and 1913. The first set of entries, identified by a zero value in 1898, is composed of new entrants, companies that for one reason or another were not

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[3.] For example, Wayne Lewchuk's study (1985) of the financial performance of the early British automobile industry included many public companies that were either never quoted in London or were quoted only late in their existence. The investigation he conducted could not be based on London data alone.

in the 1898 list but qualified by 1913. Their 1913 rank is indicated. "Surviving" companies, those in both the 1898 and 1913 lists, follow in the rankings. For these companies, the first part of the second column in the table displays the company's 1898 ordinary share capitalization and second part the percentage change in capitalization that occurred between 1898 and 1913. Thus, for example, the largest ranking company in 1898, the London and North-Western Railway (LNWR), was still the largest ranked company in 1913, despite suffering a fall of 31.2% in the value of its ordinary shares over the interval. Drop-outs, whose numbers of course must equal those of new entrants, are indicated by a ranking in 1898 but a "." in1913. Related footnotes give some idea of the company's fate. The minus 100% in the ordinary capitalization column only signifies disappearance from the rankings, not that the company's ordinary shares became worthless. Thus, for example, the first "drop-out" noted in Table 6, London & County Banking Company (#21 in 1898), merged with the second "drop-out", London & Westminster Bank (#25 in 1898), to form London County & Westminster Bank (#18 in 1913, and the third "new entrant" in Table 6). As the footnotes indicate, the most common reason for firms to drop out of the rankings was that their market capitalizations simply failed to grow fast enough, causing them to be overtaken and replaced by newcomers. Negative capitalization growth between 1898 and 1913 certainly did occur in some cases, but was somewhat less common than inadequate positive growth. As we have seen with the two London banks, mergers also account for a significant number of drop-outs. We have treated mergers between near-equals as creating a new firm (two drop-outs and one new entrant). In cases where one firm was clearly larger than another (especially if the larger firm kept its original name), the dominant firm was treated as a "survivor" while only the smaller firm "disappeared" from the rankings. London City & Midland Bank (#34 in 1898, #17 in 1913), which absorbed North & South Wales Bank (#106 in 1898), is an example of a merger that produced no newcomer and only one drop-out.

The next two columns in the table reveal, for example, that the LNWR had no uncalled amounts outstanding on its ordinary shares: the column "total paid-up" equals the

column “total nominal”. Note however that both these amounts increased equally over the internal, indicating that at some stage during the 15 years the LNWR sold additional shares for no less than par 5.09%. On the next page, the number of shares outstanding between end-June 1898 and end-June 1913, is shown to have increased by 5.09% as well. London City & Midland Bank illustrates another pattern, in this case quite common among banks. Only just over 20% of Midland’s nominal capital was paid up (compare the total paid-up column with the total nominal one). The unpaid difference was a contingent liability borne by registered shareholders. In the event of the bank suffering a catastrophe, shareholders were liable to make good any losses (but only up to the nominal total – by 1898 no large banks had unlimited liability). Midland issued new shares, but maintained the same uncalled liability on the newly issued shares as existed on the ones outstanding in 1898. A more complicated development is illustrated by Brunner, Mond (#62 in 1898). There the paid-up amounts increased at a faster rate than the nominal, indicating that Brunners both issued new shares and made calls on the holders of partially paid shares. The fact that by 1913 paid up amounts still lagged nominal ones indicates that some shares outstanding in 1913 were still only partially paid. But by 1913, Brunners’ partially paid-up shares were somewhat less common than they had been in 1898.

The next pair of columns display changes in dividends paid at the benchmark dates.[4] LNWR, for example, paid 4.13% less in dividends in the year to end-June 1913 than it had done in the year to end-June 1898. Nevertheless, in the year ending June 1913, it still paid, at £2.787m, more dividends than any other company, with the exception of J. & P. Coats (which paid £3.150m). The last two pairs of columns relate respectively to changes in the market value of traded non-equity securities and to changes in the nominal value of the same securities. For example, the nominal value of LNWR’s already-large volume of non-equity securities outstanding increased by 8.29% due to new issues between 1898 and 1913, while the market value of the same securities fell by

[4] Victorian companies pursued dividend smoothing like their modern counterparts. Thus decreases between benchmarks, followed by an increase, were fairly rare but certainly possible.

26.58%, reflecting the impact of the rise in long-term interest rates over the interval. Even so, the market value of LNWR's non-equity securities in 1913 was still nearly a third greater than the nominal value, indicating substantial capital gains on these instruments, since the issue price of non-equity issues for established companies of this size was usually very close to the nominal price stated on the instrument. Once issued, of course, the market and nominal prices could vary.

The benchmark tables identify Britain's largest companies at five-year intervals. Once a company enters the rankings, however, we continue to track its fortunes, back to its birth or to 1867, whichever is the later, and forward to its extinction (by merger or liquidation) or to 1913, whichever is the earlier. [5] The basic data (market capitalization by ordinary shares, total cumulated dividends, and the value at time issue of shares outstanding) are displayed in Figures 1a and 2a for two illustrative companies: Brunner, Mond, perhaps the period's most successful British science-based start-up, and LWNR, one of Britain's largest railways. The same data is displayed in a different format in Figures 1b and 2b. In these figures, the data are in ratio form, with at any time "t" the numerator (top line) showing the market capitalization of the ordinary shares at that time, plus the cumulated value of dividends paid from the date of the company's creation (or from 1867, whichever occurs later) up to time "t", both discounted at 6% from the same fixed point, 1867. The denominator shows the cumulated value of shares issued and outstanding, valued at the issue price, up to time "t" (including shares issued to vendors), each issue discounted also at 6% from 1867. (See appendix for further explanation).

The lower line in Figs.2a and b plots the numerator with only the (discounted) value of cumulated dividends, with the same denominator as before. [6] This ratio format

[5] We are still tracking down some companies that ceased to be quoted in the *IMM* but did not obviously disappear through liquidation or merger. When these are accounted for, there may be more liquidations than the footnotes currently indicate.

[6] The lower (dividend) line also has the virtue that it reveals immediately, by downward movements, any increase in capital (new issues). Once paid, a dividend in this calculation procedure is no longer subject to discounting. If a company simply stopped paying dividends, and issued no further shares, the dividend line would be horizontal from the time of the last dividend, whereas the total return line will fall whenever the total return in a year (capital gain plus dividend) is less than 6%.

allows one to see at a glance whether (and when) the company's internal rate of return beat a 6% "hurdle rate" on invested capital – the ratio is unity at 6% - as well as the share of total return provided by dividends alone. Fig.1b shows that Brunner, Mond very comfortably beat the 6% hurdle from about 1890 onwards (indeed dividends alone achieved that hurdle by about 1892). Fig.2b shows the characteristic pattern of a company whose best days are believed by market participants to be past, as denoted by the narrowing gap between the total valuation ratio (market capitalization plus cumulated dividends) and the dividend ratio alone. Companies like Brunner, Mond, believed in the early 1890s to have good growth prospects ahead, will show a widening gap between the two ratios, rather than the narrowing gap shown by the LNWR. The data collection procedure used here, which has resulted in a database of nearly 400 companies, does not, however, necessarily capture all of the top 125 companies that existed at any point in the period 1867-1913. Companies of the requisite size that both entered the top 125 and left between benchmark years would escape detection. We don't know how many companies might have met these conditions, but we have no reason to believe there were many. [7]

3. Measuring Risk Premiums: Some Preliminaries

To establish the risk premium borne by various securities, we need to make some assumptions about the relationships that might plausibly exist among the data. The most convenient means for this purpose is a simplified, steady-state version of the widely used Dividend Discount Model (DDM) [8]. The model is set out in Eq. (1):

[7] For example, some companies, such as United Alkali, which were known to be large at the time of creation but which subsequently suffered severe capital losses, removing them from the rankings, are in fact captured in at least one benchmark year.

[8] The classical full-length exposition of DDMs is found in M.J. Gordon (1962). Gordon had earlier developed the ideas in a series of influential articles. A good textbook presentation may be found in Sharpe, Alexander, and Bailey (1995), Ch. 18. As used here, "dividends" should be understood to include all payments to shareholders – including the proceeds of share buybacks and cash paid for shares acquired in a merger – and not just "regular" dividends. While the wider definition is appropriate for the present time, when regular and "special" dividends can diverge considerably, often due to tax considerations, the two definitions of dividends were much more congruent in the Victorian period.

Eq.(1)
$$P_{0i}^{*} = \sum_{t=0}^{\infty} \frac{E_0\left(D_{ti}^{*}\right)}{\left(1+k_{0i}\right)^{t}}$$

where P_{0i}^{*} = rational price of security i at time t = 0.

$E_0\left(D_t^{*}\right)$ = the expectation at time t = 0 of dividends (or interest)to be paid on security i at time t.

k_{0i} = a discount rate applied to security i at time t = 0, $k_{0i} > 0$.

The model asserts that the rational value of a security i at time t = 0 (the present) is equal to the discounted value (at the 'required rate', k_{0i}) of the payments it is expected at time t = 0 to make in the infinite future. The required discount rate is likely to vary across securities, reflecting varying perceptions of risk, among other things. It is important to note here that "dividends" include not only regular cash dividends, but any kind of distribution to shareholders that has a positive cash value. "Dividends" therefore include, among other things, the money firms might spend on share buy-backs and the difference (if any) between a share's market price and the amount called up on a deeply discounted rights issue. Any reasonable discount rate will cause dividends more than twenty-five or so years in the future to be negligibly small, so in practice the model is concerned with dividends expected in the relatively near term.

The "required rate of return" can in turn be broken into two components: (1) a risk-free (or nearest approximation thereto) rate of return, which might best be interpreted as the pure cost of "waiting" or minimal opportunity cost; and (2) a risk premium over the minimal opportunity cost, to reflect the possibility that expectations of higher pay-outs may not be met. As it stands, however, without the imposition of some sort of structure on the infinite stream of future dividends, Eq.(1) is not operational. The most straightforward assumption that might be used to impose the necessary structure is that of steady dividend growth, as shown in Eq. (2):

Eq.(2) $$E_0(D_{ti}^*) = D_{0i}^*(1+g_{0i})^t, \quad t = 0, \quad ,\infty.....$$

where $E_0(D_{ti}^*) =$ dividend expected at time t = 0 to be paid at time t in future.

D_{0i}^* = dividend paid currently (observed).

g_{0i} = assumed growth of dividends through time, expectation formed at time t = 0.

Eq.(2) thus provides the means to link the current (observed) dividend with future dividends. Although it is well known that whenever possible companies smooth dividends over time in relation to earnings, either by holding dividends steady, even if they are not covered by current earnings, or, alternatively, by boosting internal reserves when earnings temporarily exceed sustainable levels, the actual path of dividends is unlikely to be as predictable as Eq.(2) implies (Lintner: 1956). The natural way to accommodate this is to allow the required rate of return, k_{0i}, to vary with the uncertainty associated with a given company's dividend growth rate. Substituting the expression for $E_0(D_{ti}^*)$ given in Eq.(2), yields Eq.(3).

Eq.(3) $$P_{0i}^* = D_{0i}^* \sum_{t=0}^{\infty} \frac{(1+g_{0i})^t}{(1+k_{0i})^t}$$

where the i^{th} subscript relates to the i^{th} company.

Since $k_{0i} > g_{0i}$, a little algebra and the exploitation of some of the properties of convergent infinite series yields Eq. (3.1):

Eq.(3.1) $$P^*_{0i} = \frac{D^*_{0i}(1 + g_{oi})}{(k_{0i} - g_{0i})}$$

Rearranging terms yields Eq.(3.2):

Eq.(3.2) $$\frac{D^*_{0i}(1+g_{0i})}{P^*_{0i}} = k_{0i} - g_{0i} \Rightarrow \frac{D^*_{0i}(1+g_{0i})}{P^*_{0i}} + g_{0i} = k_{0i}$$

Let $$D^*_{1i} = D^*_{0i}(1+g_{0i})$$

where D^*_{1i} is the expected dividend of the next period, divided by the current share price. Next, split k_{0i} into the minimal opportunity cost, approximated by the Consol (or other benchmark interest) rate at time 0 (the point of observation), and an asset specific risk premium, $(rp)_{0i}$ assumed to hold at time t = 0, as shown in Eqs.(4a) and (4b):

Eq.(4a) $$\frac{D^*_{1i}}{P^*_{0i}} + g_{0i} = CONSOL_0 + (rp)_{0i}$$

Eq. (4b) $$\frac{D^*_{1i}}{P^*_{0i}} + g_{0i} - CONSOL_0 = (rp)_{0i}$$

where g_{0i} = expected growth of dividend of company i at time 0.

$(rp)_{0i}$ = risk premium for security i at time 0.

Eq.(4b), with its attendant assumptions, enables us to use the available data to estimate risk premiums. Given that dividend growth very rarely averaged more than 10% per annum for any length of time, and was generally much less, at 4% (or less), $D^{*}_{1i} \big/ P^{*}_{1i}$ was correspondingly close to the current dividend yield. If for convenience the current dividend yield is used, rather than the adjusted one stipulated in Eq.(4), which relates the next expected dividend (not the last one actually paid) to the current price, the implied risk premium is lowered, since the Consol yield is given at any date and the current yield is lower than the adjusted yield one year forward (assuming positive dividend growth)[9]. Plausible estimates of expected dividend growth can be obtained in the first instance in two ways. One is to assume that market participants exactly extrapolated dividends paid over some period in the past (say five, ten or fifteen years) into the future over a comparable horizon (again five, ten or fifteen years). The other is to assume that over some horizon, market participants "forecast" actual growth with perfect accuracy. Consol yields at monthly intervals (to maturity or expected call) are taken from Klovland (1994). An alternative benchmark rate, derived from prime three month bills of exchange, is also used.

Since Consol (or other benchmark) yields are taken as the "universal" minimum opportunity cost of holding any security, note that for a given level of the risk premium there is an exact one-for-one trade-off between current dividend yield and the expected growth of dividends: a 1% increase (or decrease) in current yield is secured at the cost of a 1% decline (or increase) in expected dividend growth (holding the risk premium constant). By the same token, a reduction in the risk premium associated with any given company is translated into an equal reduction of some combination of a decrease in dividend yield (as wealth-holders bid up the share price for any given expected dividend

[9] Positive (or at least non-negative) dividend growth is a reasonable assumption in this context. British companies in the Victorian period that repeatedly or permanently cut their dividends quickly lost their market value and, with few exceptions, are not considered here. In any event, a cut of 100% in dividends expected to be permanent would produce a rational share value of zero.

growth) and in expected dividend growth (for any given dividend yield, wealth-holders accepted lower dividend growth).

However, it is likely that arbitrage will cause expectations of future rapid growth of dividends to manifest themselves in low current (or near-term) dividend yields. In the limit, arbitrage will push current dividend yields nearly (or entirely) to zero. The converse is also true: high current dividend yields imply scepticism that the current dividend will be maintained, let alone be increased soon. This is a useful insight because zero-dividend companies should be those whose future dividend growth is expected to be particularly rapid. But it is also likely to be true that zero-dividend companies will possess a relatively low risk premium, that arbitrage will not only push the dividend yield for rapidly growing companies down, but will also result in a reduction in the risk premium. This follows because as the dividend yield falls, the payoff from holding the security moves farther into the future, an intrinsically risky proposition. Consequently, dividend yields and expected dividend growth rates are unlikely to change one-for-one. A one percentage point fall in current (or near-term) dividend yield is therefore likely to reflect an increase in expected dividend growth of less than one percent, implying a decrease in the risk premium. Eq.(4) also confirms intuition: a falling risk premium generally implies a rising share price.

The data in Tables 7 and 8, combined with Eq. (4b), allow an immediate inference from the DDM: the average British risk premium has fallen sharply over the past century. Dividends generally, and dividend growth in particular, are now valued significantly more highly than they were in the Victorian period. This can be seen most easily by re-arranging Eq.(4a) so that the observable variables are both on the left hand side while both unobserved variables are on the right, and replacing CONSOL with the more general notation BENCHMARK.BOND. Also the subscripts for prices and dividends are amended (the i subscripts are deleted) to denote broad market averages rather than individual securities. The result is Eq.(4c):

Eq.(4c) $$\frac{D_1^*}{P_0^*} - (BENCHMARK.BOND)_0 = (rp)_0 - g_0$$

If the near-term dividend yield is greater than the benchmark interest rate, then the risk premium must be greater than the expected dividend growth rate, whatever that rate may be.[10] If near-term dividend yield is equal to the benchmark interest rate, then the risk premium just equals expected dividend growth. If the benchmark rate is less than the near-term dividend yield, then the risk premium is less than expected dividend growth, and equity prices are correspondingly higher (note the inverse relationship between P_0^* and $(rp)_0$). Such inferences can be made without further knowledge of either dividend growth expectations or risk premiums. Consider Table 7, setting out dividend yield and Consol data for the pre-1914 period, indicating that dividend yields were unambiguously greater than Consol yields. To be concrete, using the data for 1913 (Consol current yield of 3.25%; near-term dividend yield of 5.69%, obtained from the current yield of 5.52% and assuming average dividend growth of 3.02% [see Col. (1) of Table 9]) the left hand side of Eq.(4a) has a value of 2.44%. Col. (1) of Table 9 shows the actual dividend growth over the three 15-year benchmark intervals to have averaged 3.02%, albeit with substantial variance, especially over the period 1883-1898, when dividend growth fell sharply. If we use the average growth for the entire 45-year period as a reasonable representation of expectations, we obtain an aggregate risk premium for 1913 of 5.46% (= 2.44% + 3.02%). (As might reasonably be inferred from the current dividend yields, this rate is somewhat higher than the average for all five per-1914 benchmarks, which was 4.70%.)

Now consider Table 8, relating to the very recent past, where, equally unambiguously, benchmark interest rates are higher than the average current dividend

[10] Risk premiums cannot plausibly be negative. A negative premium would result in an expected yield less than that earned on the safest asset available. Over very long horizons, some economists (see in particular Siegel (1998)) have argued that the risk premium might rationally be lower than generally observed (i.e. that equities are generally undervalued), but few are persuaded that the risk premium should be even close to zero (say under 1.0%), let alone zero or negative. See Wadhwani (1999) for further discussion. As noted above, expected dividend growth rates cannot be negative for any extended period without driving the rational price to zero. In the discussion here, no attention is devoted to implausible outcomes and both the risk premium and expected dividend growth are assumed to be positive.

yield of large-cap British companies: using the current yield of the long-dated benchmark bond (maturing in December 2028), the difference is – 2.46%. If we use a generous estimate of current dividend growth for British companies of some 3.50%, giving full allowance for such factors as share buy-backs and mergers and acquisitions financed by cash, factors which plausibly can be considered as a form of dividend payment, we obtain (using 2.12% as the appropriate near-term dividend yield) a risk premium for the current period of 1.20%, which some consider to be so low as to border on the irrationally exuberant.[11] At 1.20%, the current risk premium is just over 20% of its 1913 level and implies that equities are much more generously priced at the present time than they were before 1914.

Another way of expressing the consequences of the reversal of sign in Eq.(4a) when applied to the two sets of data is to say that entrepreneurship (or perhaps more accurately, entrepreneurs corporate vehicles) is more highly valued now than it was then. If, for the sake of argument, it is assumed that the entire impact of the difference in risk premium shows up in price (that is, that cash dividends, expectations of dividend growth, and benchmark interest rates remained as they were, with only prices and the risk premium changing), and the current risk premium of 1.20% were applied to Victorian equities instead of the actual premium of 5.46%, Eq.(4a) implies that the average Victorian large-cap equity price would have been nearly 4.5 times greater than it actually was. Conversely if the large Victorian risk premium were applied to current share values, Eq.(4c) would imply a sharp fall – on the order of 67% - in the average value of a FTSE 100 share. While such calculations are crude, making no allowance for the possibility that the same process that has bid up current share prices might well cause the value of bonds

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[11] Incorporating such factors as share buy-backs, deeply discounted share issues, and cash-financed merger and acquisition activity into calculations of dividend yields and dividend growth is an exacting and complex business. Taking account of them, Wadhwani (1999: 101) has estimated that one might reasonably (albeit somewhat flatteringly, since mergers and share buy-back programmes are unlikely to sustain the rapid pace of recent years) adjust observed real dividend growth in the U.S in the recent past from 1.90% to 2.35%, an increase of 23.7% in the growth rate. Similarly the near-term aggregate dividend yield might plausibly be raised from 1.65% to 2.55%, an increase of 54.5%.

to fall (yields to rise) as investors adjust their portfolios or that the level of risk premiums may be linked dividend growth, they do serve to illustrate both the innate inverse relationship between security prices and risk premiums (*ceterus paribus* prices rise as risk premiums fall, and *vice versa*) and the markedly warmer reception investors now extend to entrepreneurs.

4. Risk Premiums in Victorian Capital Markets

Table 9 sets out key features of the financial performance of the Victorian large-cap corporate economy as displayed by the data described in Section 2 above. Most notably, dividend growth averaged 3.02% over the 45 year period, while share price appreciation (reflecting evolving expectations of future dividend growth) averaged 2.76%. Both series exhibited substantial fluctuations over the period, but the variations in price appreciation were both greater in magnitude and persistently downward, failing to register the recovery in nominal dividend growth that began around the turn of the twentieth century. Note that Table 9 makes no allowance for new capital raised or for "index drift", the fact that relatively poorly performing companies drop out of the rankings as stronger performers enter. Both factors serve to enhance reported dividend growth and annual average share price appreciation, and should be considered upper bound estimates of the experience of large companies generally.

Table 10 reports risk premiums for the entire large-company data set. For each interval, g_0, is calculated in two different ways. First, when data permit, by extrapolating past experience over a given time horizon (five, ten, or fifteen years) forward into the future over an horizon of similar length. Secondly, again when data reasonably permit, by assuming that market participants enjoyed perfect foresight, correctly anticipating future dividend growth exactly[12]. Two different benchmark interest rates are employed, capturing bond holders' experience at the polar ends of the fixed

[12] No attempt is made to extend the perfect foresight assumption over the period of the First World War. The assumption made here is that the War changed expectations in a profound way that could not be anticipated until the event had actually occurred.

interest yield curve: Consol yields to maturity (or date of first call) at the long end and prime 90-day bills at the short end. The 90-day bill rates are taken from Mitchell and Deane (1962). The two columns at the far right report the results for the relevant benchmark rates. The data of Table 10 show risk premiums ranging from a maximum of 6.43%, for the interval 1868-1883, using the money market benchmark rate, to a minimum of 0.92%, for the sub-period 1883-1888, again using the money market benchmark rate. In all, Table 10 reports 10 separate calculations, producing an average risk premium over the entire period of 4.26% using the Consol benchmark and 4.02% using the money mark one. More often than not for the benchmark dates chosen, the yield curve was inverted, with short rates higher than long ones, but only for 1913 (when the inversion was especially pronounced) does this produce an unusually large spread in the risk premiums. Generally (but not invariably) choice of benchmark interest rate makes little difference. The average risk premiums drawn from Table 10 are somewhat lower than that taken from Table 7 (4.70%) using the average dividend growth rate for the entire period of 3.02%. Nevertheless, a benchmark risk premium of between 4% and 5% for the period emerges from the data.

Table 11 performs an analogous calculation of risk premiums for the railways alone, using exactly the same benchmark dates and assumptions regarding g_0 as were used for the entire sample. Again dividend growth rates were obtained in two ways. First, at each benchmark date, the previous experience of the railways was extrapolated into the future, over horizons of the same duration as the interval during which expectations were assumed to have been formed (five, ten, or fifteen years). Secondly, at each benchmark for which data exists, perfect foresight of future dividends is assumed. Comparing all-(large-cap) company premiums with those on the railways finds that with few exceptions (1868-1883 [perfect foresight] and 1883-1888 [extrapolation], and those only minor) the railways enjoyed lower average risk premiums than did large-cap companies as a whole, despite achieving inferior out-turns after 1883. This finding is reasonably robust to the assumptions used to calculate risk premium, because for every benchmark year displayed

in Table 5, the average dividend yield of the railways was lower than that of the top 125. Only in the period 1868-1883, when ironically railways had a slightly larger risk premium than did the large-cap sector as a whole, did the railway sector out-perform the large-cap sector as a whole (9.28% vs. 8.21% for all large-caps, a difference of 1.07%). That period, 1868 and 1883, encompassed the golden age of the railways. Between those two benchmark years, the railways enjoyed faster growth than all companies of both market capitalization and dividends, although the difference was not great, especially for dividend growth, 4.16% *vs*. 3.80% (a difference of 0.36%, or 36 basis points).

The next five years proved to be difficult for all companies, but especially for the railways. The top 125 as a whole experienced a very slight decline in aggregate dividends between 1883 and 1888, while the railways experienced a much sharper one, leaving a difference in dividend growth between the two groupings of 212 basis points. For both groups, market capitalizations increased, but much faster for all companies than for railways. The next decade, to 1898, saw general recovery, with positive growth in both market capitalizations and dividends, only to be followed by renewed difficulties in the final period, between 1898 and 1913, when railway market capitalizations contracted sharply, ending up in aggregate a third lower at the end of the 15-year period than at the beginning, while the all-company capitalization grew at less than 1% per annum. Indeed, in the final period, 1898-1913, in terms of actual financial out-turn, large caps as a group, out-performed railways by a huge 5.78%. Yet even in 1898, after 15 years of relative under-performance, railways maintained their relatively favourable risk premiums. In 1898, using the extrapolation assumption (which fully incorporates the weak performance of the preceding 15 years), railways enjoyed a 1.70% lower risk premium than the large-cap sector as a whole (with correspondingly higher share prices). [To compare the actual out-turns of the large-cap sector and the railways, see Tables 9 (all 125 companies) and 11a (railways)]. In other words, the relatively highly rated rail sector under-performed the corporate sector as a whole, to the acute disappointment of railway shareholders. Even so, in 1913, after 30 years of under-performance against the large-cap sector as a whole, the dividend yield of railways, at 4.62%, was still lower than the all-company average of 5.52%. Railway shareholders as a group were clearly betting, consciously or

not, that the railways would be restored to their former financial glory. So firmly held was this conviction, that if one is looking for evidence of irrational exuberance in Victorian stock exchanges, it is to be found most readily in the rail sector, as indicated by the number of estimated risk premiums of 1.00% or lower (or even negative, as in 1883-1888 [perfect foresight]).

Before concluding this sketch of the broad dimensions of the evolution of the Victorian risk premium for large companies as a whole and the important railway sector in particular, it is useful to consider briefly the evolution of the benchmark Consol yield (see Table 7).[13] After all, the Consol (or other benchmark) yield offers an indication of the opportunity cost of investment in terms of nominal default-free time preferences and plays directly a key role in the calculation of the risk premium. Because the Consol yield is negatively related to the risk premium (see Eq.(4)), the lower is the Consol yield (*ceterus paribus*), the higher is the risk premium. This relationship also makes intuitive sense, for a shift by investors out of Consols and into equities will serve to lower Consol prices (and hence raise Consol yields) while raising equity prices (and hence tending to lower dividend yields).

The data on Consols in Table 5 suggest that the opportunity cost of investment was not great, although risk aversion must have been. First, Consol yields remained markedly lower than dividend yields throughout the period. These low yields were sustained despite the fact that the government was well known to be vigilantly seeking every opportunity to reduce the cost of servicing its massive debt, of which £500m. nominal was held by the public in 1888. [14] The terms of the two 3% debt instruments introduced in the eighteenth century – the Reduced 3% Consols of 1749 and the famous, and much more liquid, 3% Consols of 1751 - permitted redemption at par with one year's notice. The 3%s issued in 1844 allowed redemption in thirty years' time, (that is, after 1874) without notice. Once

[13] This is not the place for a full discussion of the Victorian yield curve. It should be borne in mind, however, that comprehensive treatment of Consol yields also requires some discussion of yields at the short end of the fixed-interest market.

[14] Since the issues were redeemable only at par, and interest rates were quite low in the mid-1880s, the nominal and market values in 1888 were essentially identical.

Gladstone had reformed Britain's budget to the point where surpluses were frequently assigned to debt sinking funds, redemption at par became a real possibility. If broad market interest rates were sufficiently below 3%, the government could forcibly retire the now-expensive 1751 3%s and replace them with issues bearing a smaller coupon. Gladstone himself had sought to exploit this possibility by introducing in 1853 "new" Consols that paid only a 2.5% coupon, the reduced pay-out sweetened by terms that deferred any threat of compulsory redemption for 40 years, to 1894 at the earliest. However, wealth-holders refused to take the bait and the government managed to sell very few of the New (Gladstone) 2.5%s. The succession of budget surpluses in the 1880s in an environment of low interest rates, however, was to tip the balance decisively.

In 1884, Consol holders were offered the opportunity to swap at rates above par their various 3%s into New (Childers) issues carrying coupons of either 2.5% (at a conversion rate of £108 for every £100 nominal of a 3% issue) or 2.75% (at a conversion rate of £102), the government more than gaining in reduced servicing cost what it lost in the increased nominal value of the debt outstanding. Again the uptake was disappointing for the government - few were sold. But time and continued budget surpluses were on the government's side. Finally in 1888, George Goschen did the trick, making the holders of 3%s the offer they couldn't refuse. In return for accepting conversion of their 3%s at par, holders were offered new (Goschen) Consols paying 3% until April 1889, then 2.75% until April 1903, and 2.5% thereafter, with no possibility of redemption before 1923. The point is that until a real military crisis broke out in 1914, there was no scope for an increase in the coupon paid on the most liquid government issue. Market speculation was confined to how much the government might be able to cut the coupon: all the way to £2.50 or only to £2.75?[15] Given that the scope for income increases from

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[15] In Panel C of Table 4, the reported decline in income growth between 1868 and 1883 reflects the government's efforts to reduce the coupon paid from 3.00% to 2.50&. The threat of conversion at par prevented the price of 3%s from rising above £100. Although relatively few 2.50%s were sold, the government's threat was a credible one, believed by contemporaries to directly affect the price of Consols (*The Economist*, quoted in Harley (1976: 102). The increase reported between 1888 and 1898 reflects Goschen's compromise, undertaken to guarantee at long last the success of the conversion, whereby the coupon was

Consols was so limited, it can come as no surprise that the scope for capital growth was limited as well. Indeed, given the persistent downward pressure on coupons, the only scope for increased income and attendant capital gains came from falling prices, thereby permitting real returns to be greater than nominal ones. Consol returns were thus unusually sensitive to inflation (or deflation).

The relatively high price of Consols (relative to dividend yield) is therefore curious, for their exposure to inflation risk was high. That risk could manifest itself in either or both of two ways. First, a war, even one as small as the Boer War, could force the government to issue more bonds, pushing down their price even while suddenly increased urgent government spending pushed up domestic inflation, both influences damaging Consol holders. Secondly, even in the absence of a war serious enough to materially affect Consol prices, the value of the instrument was still vulnerable to inflation arising (most plausibly) from gold discoveries. While the commitment of British governments to the gold standard was rationally unquestioned, that same commitment meant that gold would flood into the Bank of England in the event of large gold discoveries, matched by an equal flow of sterling banknotes out. Moreover, the Bank of England had become adept through central bank co-operation and other strategies (the "gold devices") at making whatever gold reserve it possessed go further in the quest to maintain the convertibility of sterling. Contemporary appreciation of this ability can be seen in the marvel at how the Bank managed to be "leader of the orchestra" in the foreign exchanges with extraordinarily slender gold reserves. By the early twentieth century the Bank's gold reserves, at about £40m., were only about half those of the Bank of France and Reichsbank, not to mention those of the profligate Americans, whose failure to have a central bank condemned them to maintain inefficiently and expensively large gold stocks elsewhere within their financial system. Of course, the Bank's growing skill at leveraging

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reduced only 25 basis points, to 2.75%, for 14 years, followed by an automatic reduction to 2.50% after April 1903.

its gold reserve meant that the impact of a surge of gold discoveries would also be amplified. It is therefore ironic that an economy that valued Consols so highly should also be the economy that financed gold discoveries so enthusiastically and effectively, as we shall see in the next section.

5. Risk Premiums in Growth Sectors: Chemicals and Mining

Against the benchmark risk premiums presented in the previous section, this section looks at two specific sectors chosen for their importance and for their financial success. The first is the chemical industry. While other firms (Nobel Dynamite Trust [incorporated 1886; #78 1913] and Kellner-Partington [incorporated 1889; #98 1913]) in this industry appear within the data set, the analysis here is confined to Brunner, Mond [incorporated 1881; #22 1913], by far the most successful firm in the industry as measured by its profitability and the growth of its market capitalization. In terms of risk premium, Brunner, Mond's experience can be taken as the lower bound for the large-cap chemical industry as a whole (i.e. the other two companies in the 1913 rankings were valued less highly)[16]. The chemical industry is a particularly useful one to analyse in the context of the debate over Victorian entrepreneurial performance. The industry was at the forefront of commercially exploiting growing scientific understanding and its success (or otherwise) acted as a vivid example to many. Hence the pricing of entrepreneurship in this industry is central to debates about Britain's economic performance not only in the nineteenth century but in the twentieth as well.

Table 12 sets out the calculation of the risk premium for Brunner, Mond. The periodization corresponds where possible exactly to that used in Section 4. The calculation procedures are identical as well. Although Brunner, Mond (henceforth B-M) was incorporated in 1881 (the predecessor partnership had been established in 1873), the company first appears in the large-cap benchmark in 1888 (at # 89). Thus all comparisons are from that year. However, not surprisingly, given the rapid growth of its

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[16] The dividend yield for Nobel Dynamite trust in June 1913 was 6.02%; for Kellner-Partington, 5.98%.

market capitalization, its experience between 1881 and 1888 was consonant with its subsequent performance. The data permit the calculation of eight estimates of risk premiums. What emerges most clearly from Table 12 is that for every permutation (over periods; over representations of expectations of dividend growth, whether extrapolation or perfect foresight; over benchmark interest rate) the risk premiums are markedly higher than the large-cap benchmarks. Using current dividend yields as a proxy for risk premiums - on the grounds that while current dividend yields capture only some elements of expectations of future growth, they are less sensitive to the particular assumptions used – reveals that not until the very end of the period, from 1908 onwards, does B-M's dividend yield slip even marginally below that of the large-cap average (5.19% *vs*.5.52% in 1913). At no time does it drop below the railway average. B-M's relatively high risk premium translates into a relatively low share price. Had B-M been accorded just the average risk premium applied to large-cap companies, its market capitalization in 1913 would have been twice as large as it actually was. Had the railway sector risk premium been applied, B-M would have been worth approximately three times its actual 1913 capitalization. Given its remarkable record of dividend growth, the efforts of its principals were curiously lowly valued. Victorian capital markets afforded entrepreneurs in this sector remarkably little fuel, in the form of high share prices, to drive further expansion and experimentation. Table 12a, which reports BM's actual financial out-turn, which was in total consistently comfortably above 10%, suggesting that in the chemical sector at least investors were slow to appreciate unusually good performance.

The same cannot be said so confidently about the mining industry, a sector in which Victorian investors were deeply involved, often highly successfully. The industry emerged slowly into the rankings of Britain's largest companies. None were present in 1868. Only a single, relatively small company, Tharsis Copper & Sulphur, appeared in the 1873 rankings, to be joined by another Spanish mine, Rio Tinto, and a domestic coal company, Mason & Barry, in 1878. This early trickle became a flood after 1883, as South Africa (and other centres of gold mining) attracted strong interest. For example, in the 1878-1883 benchmarks, the three mining companies then represented among the large-caps (Tharsis, Rio Tinto, and Mason & Barry) had in 1883 a combined market

capitalization of ordinary shares of £13.6m. (2.3% of the aggregated value of the ordinary shares of the 125 largest companies in that year). Between 1883 and 1898, newcomers to the 1898 large-cap rankings raised in their early public offerings an even larger amount, £21.8m. To put this sum in perspective, the capital raised by B-M, Nobel Dynamite, and Kellner-Partington combined down to 1913 was only £6.1m. (of which £2.9m. [48%] was B-M and £2.3m. [38%] Nobel Dynamite). In the 1898 benchmark, the combined market capitalization of all the mining companies ranked then reached the ample figure of £90.2m. (9.6% of the aggregated value of the ordinary shares of the 125 largest companies in that year). This success encouraged more ventures. Between 1898 and 1913, perhaps a further sum of £40m-£50m. was raised through new issues.[17] While many of the 27 new-comer ventures in the period 1898-1913 were not successful (eleven failed to appear in the 1913 rankings despite having been ranked in 1903 or 1908), and while of the 19 mining companies in the 1898 rankings 10 had dropped out by 1913 – seven through sharply falling market capitalizations and three through mergers with ranked companies - nevertheless the 25 mining ventures ranked among large-cap companies in 1913 had a combined market value of ordinary shares of £145.3m. (13.9% of the aggregated value of the ordinary shares of the 125 largest companies in 1913).

A successful mine could be fabulously profitable. In 1913, De Beers (#6, the largest ranking mine) with only £4.500m. in paid-up capital (the amount originally invested in the venture, but excluding premiums), paid dividends on ordinary and preference shares in excess of £2.0m., rivalling those paid by the largest railways. Rio Tinto (#9), the next largest mine with even less total paid-up ordinary capital, amounting

[17] The sum of £40m-£50m. is only an approximation. The large number of companies that entered, and left, the large-cap rankings make an exact calculation difficult. The £40m-£50m. figure was reached by first taking the IPO values of all large-cap companies created in the period 1898-1913 (i.e. that first appear in either the 1903 or 1908 benchmark rankings) that were still in the large-cap rankings in 1913. This value was £20.7m, raised by 16 companies. The remainder, some £20-£35m. (a conservative estimate; the actual value was £33.5m.), was reached by taking the market capitalization of the ordinary shares of new mining companies established after 1898 that appeared in either (or both) of the 1903 and 1908 benchmarks but were unable to hold their value sufficiently to hold a place in the 1913 rankings. There were 11 of theses companies. As a group, these mines had a very chequered career, with some showing losses over their IPO values quite early in their existence. Even so, £30m. is probably in excess, perhaps considerably so, of their IPO values.

to only to £1.875, paid £1.69m. in dividends. Rand Mines (#20), the third largest mine by market capitalization of ordinary shares, with paid-up ordinary capital of £0.515m., paid £1.17m. in dividends. However, despite such remarkable capital gains and generous dividend pay-outs, in some cases sustained over many years, the intrinsic risks of the mining sector still showed through: De Beers current dividend yield in June 1913 was 10.11%; Rio Tinto's 6.22%, and Rand Mines' 8.63% (see Table 13). Investors clearly did not expect the good times to be highly durable. The mining industry, then, is complex. Good mines paid extremely well, at least for a while, but the search for a bonanza was fraught with risks. An example, drawn from the 1898 large-cap rankings, and thus excluding the most egregious losses, might illustrate the situation.

The Simmer and Jack Proprietary Mine had been incorporated in 1887, six years before the incorporation of Rand Mines. Simmer and Jack had aimed high, raising in paid-up capital £5.0m., almost exactly 15 times the amount ultimately raised before 1913 by Rand Mines in its public offerings. But by June 1898, the £5.0m. originally invested in Simmer and Jack was worth only £3.8m. (a mere 39% of the value of Rand Mines in that same month). Moreover, the outlook in mid-1898 for Simmer and Jack's ordinary shareholders was not good either, for the company paid no dividend. Indeed it appeared in the 1898 rankings only because it had raised so much money to begin with. Had the market value of the company simply held its paid-up amount, the mine would have been #40 in the 1898 rankings rather than #60. Although the company paid sporadic dividends, including one of £600,000 in 1908, the market capitalization of its ordinary shares fell to

by 1913, well below the top-125 cut-off value of £2.388m. Moreover, the experience of mines that made it into the large-cap rankings is generally better than the many that didn't. To achieve a large-cap ranking, even when it could not be sustained for long, meant that a mining venture had to have an unusually appealing story, suggesting a better than average chance of big success. Long shot ventures, unless they hit lucky early, never made it into the large-cap rankings. Hence, consideration of large-cap ventures alone biases strongly upward the industry's performance. Because of the extreme variance of experience in the industry, ranging from large ventures doomed from the start that never paid out anything, only consuming investors' capital, to relatively

small ventures like Rand Mines that struck it rich on a comparative shoestring, survivor bias is perhaps more important to bear in mind when analysing the mining industry than most others.

With survivor bias in mind, consider Table 14, which sets out the British-based mining industry's experience in terms of averages of annual dividend growth and capital appreciation. The dates of the first panel – 1a. and 1b.- match as far as possible the periodization of first panels used earlier. The period covers 1873-1883 (rather than 1868-1883, because no mining venture appeared in the 1868 rankings). In the second period, 1883-1898, the data is split into two categories. The first, (labelled 2.1) records the experience of the three companies (Tharsis, Rio Tinto, and Mason & Barry) that appeared in the 1878 and 1883 benchmarks. While the three companies had enjoyed phenomenal success between 1873 and 1883, that success was not sustained over the following 15 years: in fact total return, at –0.44% per year, was slightly negative. Table 13 throws some light on this performance. Both Tharsis and especially Rio Tinto were long-term survivors, but both hit a difficult patch between 1883 and 1888. Rio Tinto recovered strongly and by 1913 had come to enjoy a 21% capital gain over its 1883 capitalization. Tharsis did not fare so well: in 1898 its capitalization was marginally below the level achieved 15 years earlier but still sufficient to keep the company in the top rankings, albeit at a considerably lower level. Mason and Barry had the poorest performance of the lot, dropping out altogether by 1883, never to reappear.

The second category (labelled 2.2) for the 1883-1898 period records the experience of 17 new-comer mining ventures, companies not in the rankings in 1883, but which appear in them in 1898. Not surprisingly, the new-comer ventures turned in strong performances. (Two new-comer mines that entered the large-cap rankings in 1888 and 1893 but failed to hold their value, dropping out by 1898, are not included in category 2.2. Had they been so, the reported performance would have been somewhat reduced.[18]) Category 2.3 provides a rough average of the experience of the two groups, attempting to

[18] The reduction would not have been large. The total paid-up capital of the successful newcomers was £21.8m. by 1898. The paid-up amounts of the two short-term members of the large-cap rankings probably amounted to no more than £1.0m. perhaps 5% to 10% of that of the successful ones.

replicate the experience of someone who invested in the two categories in proportion to their average market capitalizations over time. Since the new-comers raised more money in the period than the incumbents' initial value in 1883, and the new-comers as a group also enjoyed strong capital growth, their experience dominates the average. In the final period, the situation is more complex still. Category 3.1 reports the experience of all 1898 incumbents, including those that dropped out of the rankings at some point before 1913. The performance of this group was better than that of the 1883 incumbents (Category 2.1), but represented still a sharp decline from the previous experience of the same group of mines, suggesting that most mines at the time (and particularly mining companies concentrated on one mine or one area) had only a limited life-span. As in the previous period, the 16 new entrants into the large-cap rankings (Category 3.2) enjoyed strong performance, with a total return (over paid-up capital) of 17.0%.

However, in 1898-1913, unlike in 1883-1898, there are too many transient new entrants (those that appeared in the 1903 or 1908 rankings but dropped out by 1913) to ignore. For these 11 companies, which had a combined market capitalization of £33.5m. in 1903, the estimate of average capital appreciation is based on the assumption that in 1913 these companies had an average market value of ordinary shares equal to 90% of the 1913 cut-off value. (The value of the lowest ranking large-cap firm in 1913 (#125) was £2.388m. Hence 90% of this figure would be £2.149m., making the estimate of the combined value of the 11 drop-out firms in Category 3.3 £23.6m). Given the short tenure of these companies in the large-cap rankings – all 11 ventures appear in the 1903 rankings, but only one, Waihi Gold Mines, is still ranked by 1908 and none by 1913 – the 90% assumption is probably too generous. On the other hand, 10 of the 11 mines paid dividends in 1903, so investors did not face a complete loss. Since the paid-up amounts of these 11 mines is not currently available, it is not possible to give a more precise estimate of the overall profitability of these ventures, but it is unlikely to have been great.

Indeed, these companies paid generally modest regular dividends in 1903[19]: the largest pay-out was £360,000, made by Angelo Mines, which represented a current dividend yield of 8.28%, a relatively high value, suggesting market scepticism that the dividend could be sustained. Given the relatively low dividend pay-outs of most of the 11 companies (not only was the largest one [excluding Great Boulder, see note 10] only £360,000, but the average current dividend yield was low as well, at 4.75% [again excluding Great Boulder]), it is likely to be the case that these 11 mines entered the rankings like Simmer and Jack had done earlier, on the basis of large amounts of capital raised in initial offerings. If so, investors suffered correspondingly disappointing returns. No attempt is made to factor the experiences of Category 3.3 firms into an average for the period, but it is considered here in order to get some insight into the extent of survivor bias among large-cap firms.

Category 3.4 concludes the table of mining out-turns, showing moderately strong performance. The category is an average of 3.1 and 3.2, obtained by taking the average values of each of the two categories over the period (for Category 3.1, the average of the 1898 and 1913 market values; for Category 3.2, the average of the paid-up capital by 1913 – a proxy for 1898 market prices – and 1913 market values) and using these averages to generate the weights given to the two categories. The weights were 71.7% for Category 3.1 (with an average market capitalization over the period of £194.5m.) and 28.3% for Category 3.2 (which had an average value of £41.1m over the period).

Table 14 now might be compared with Table 15, which shows the risk premiums for the various categories of companies in the mining industry calculated in the same manner as done earlier for all large-cap companies and for the railways and B-M. First, reflecting the generally large current dividend yields and the often strong dividend growth rates of large-cap mining companies, the estimated risk premiums are often large. The average over all 18 observations is 15.33% using the Consol benchmark and 15.08%

[19] There was one important exception, Great Boulder Perseverance, #121 in the 1903 ranking, with an ordinary share market capitalization of £2.250m.. In 1903, Great Boulder paid an extraordinary dividend of £1.500m., clearly part of a winding-up process.

using the money market benchmark. This average is markedly higher than B-M's at 10.35% (Consol benchmark). However, perhaps not surprisingly given the diversity of the industry's experience, the variance of risk premium estimates is much greater than for B-M. For example, in the period 1883-98, for the three companies that had appeared in a benchmark before 1883 (Tharsis, Rio Tinto, Mason & Barry), the risk premium assuming perfect foresight was no more than 3.79% (the product of a high initial dividend yield and a slight erosion of the dividend paid over time [i.e. negative growth]). The premium was even lower for the 11 new-comers to the ranks of large-cap mining companies after 1898 which were not still in the rankings in 1913. For them, the risk premiums were negative, the product of relatively low (for mines) initial dividend yields (4.75%) and negative dividend growth.

A first glance, it might appear that these two industries - chemicals (as represented by Brunner, Mond) and mining – prospered in spite of the valuations rendered by Britain's capital markets rather than because of them. Both industries flourished and grew strongly even though their shares laboured under remarkably high premiums (which depressed their prices). In both cases, the premiums were multiples of those accorded British large-cap companies as a whole, and even larger multiples of those accorded the struggling railways. Given the merger activity in both sectors, it is a plausible speculation that both would have grown even faster and more successfully had they possessed higher market ratings. It would appear from this data that Victorian markets put surprisingly low values on entrepreneurs. This notion is reinforced by some impressionistic observations drawn from other sectors prominent among large-cap companies. Consider for example banking, which (combined with insurance) was, after railways, the second largest sector in the large-cap group.

Like the railways, the banking sector too experienced poor profitability growth from 1868, but especially after the turn of the century. The five largest banks of 1898 (Bank of England, National Provincial Bank, Bank of Ireland, London & County Bank, and London & Westminster [20]) all had suffered substantial losses on their equity values by 1913. But unlike

[20.] The latter two banks merged to create London County & Westminster Bank. However, the combined value of these two banks in 1898 was 23.4% greater than their merged value in 1913.

the railways, this dismal performance of the sector's largest members was partially offset by the good performance of others lower down the rankings in 1898. The star performer in this regard was London, City and Midland, which increased its ordinary share capitalization from £6.223m at end-June 1898 to £14.720m at end-June 1913. Only a fraction of this increase in ordinary share market capitalization of 136.54% (equal to £8.497m) can be explained by the £2.522m of newly paid-up equity the bank raised in the interval. The gain on basis (1898 equity market capitalization plus new issues) worked out at 68.3%, a performance that lifted the bank from #34 in the 1898 rankings to #17 at end-June 1913. Here the bank was only £142,000 in equity capitalization behind Lloyds, whose own equity capitalization of 1898 had grown by 85.0% over the period to £14.862m (including £2.169m of newly issued, partially-paid ordinary shares), leaving a gain on basis of 45.7%. Farther down the rankings, the picture was mixed. Some of the smaller banks performed reasonably well (at least registering gains), like Parr's (#36 in 1898), which realized a 29.9% gain, and Manchester and Liverpool District (#38), which realized an 11.5% gain. Others, like British Linen (#35 in 1898), with a 12.5% loss, and Manchester and County Bank (#66), with an 8.1% loss despite increasing its paid-up capital by 25%, did not.

In both the periods 1868-98 and 1898-1913 considered here, the market capitalization of financial sector firms remaining in the top group (including insurance companies as well as banks and other finance companies) grew more slowly than that of the top 125 as a whole. Indeed, in the earlier period (1868-98), the aggregate value of the financial sector's equity in the top 125 grew at the annual rate of 1.40%, only about a third of the rate of the top 125 overall and conspicuously more slowly than even the railways. Performance between 1898 and 1913 was better. Positive capitalization growth, at an annual rate of 0.89%, handily exceeded the sharp contraction of the railways and was fractionally better than that registered by the top 125 as a group, 0.73%. However, at 2.94%, aggregate financial sector dividends grew at an annual rate more slowly than those for all companies in the top 125 (which grew at an annual rate of 3.65%), leaving the financial sector dividend yield, at 4.98%, below the all-company average - 5.52% - but above that of the railways (4.62%). The Bank of England and the Bank of Ireland, both of which had actually cut their dividends in the 1898-1913 period by at least 10%, continued to have dividend yields at end-June 1913 far below the

sector average, at 3.89% and 4.44% respectively. In marked contrast, a dynamic group of more successful banks - London, City & Midland, Lloyds, and Hong Kong & Shanghai Banking Company (HSBC) - that had their origins outside London and subsequently sought in the late nineteenth century to consolidate their success by establishing a London presence had grown conspicuously rapidly while still increasing their dividends payments. The cash dividend increases over the period 1898-1913 for these banks were 188%, 118% and 155% respectively. Nevertheless, these dynamic, growing banks had dividend yields at end-June 1913 either above the financial sector average or, in the case of Midland, only slightly below it (at 4.88%). These relatively high current dividend yields and thus (given the rapid growth of their dividends) unusually high-risk premiums resulted in correspondingly depressed share prices. Once again, in another important sector, good entrepreneurial performance was conspicuously under-valued. All in all, the financial sector as a whole, especially the banking part of it originating in and concentrating first on London, while not suffering to the same degree as the railways, was showing signs of strain, suggesting that the deterioration in this component of the service sector that Broadberry (1998) has detected from his studies of productivity may have begun before 1914. The relatively weak share prices of the most dynamic firms in the sector clearly did not help improve performance.

A final example – that of Maypole Dairy - will have to serve to illustrate the pervasiveness of the entrepreneurial discount meted out by Victorian stock exchanges. Maypole was a pioneer in supplying fresh dairy products to Britain's lucrative urban markets. Maypole had gone public in 1898 and had grown rapidly to reach a market capitalization of £7.4m by 1913, ranking the company #36 in that year. At end-June 1913, Maypole, paid a remarkable dividend of 6.52% on the market value of its shares when the average for the top 125 companies was 5.52%. [21] In considering Maypole's relatively high dividend yield, one should note that it was achieved with a rapidly rising share price (as its rapid movement up the rankings indicates) rather than a falling one like the railways. Maypole's total cash dividend payout in the year to end-June 1913 was £483,125. Only 27 other companies, six of which

[21.] The average was calculated as the aggregate cash dividend paid by the 125 companies divided by their combined ordinary share market capitalization. See Table 4.

were in mining, an activity that we have argued should normally be expected to pay large dividends, paid more to ordinary shareholders. [22] Had Maypole's dividend been valued in 1913 at the average railway multiple, the company's market capitalization would have been 41% larger than it actually was. Here again was an innovative new departure curiously undervalued by an investment community transfixed by railways and London-oriented banks.

However, before rushing to the conclusion that Victorian stock exchanges marked down entrepreneurial initiatives and successes wholesale, it is necessary to consider the mining sector more closely, for two main reasons. First, the structure and variance of the risk premiums for the large-cap mining industry shown in Table 15 suggest that survivor bias has caused them to be sharply higher than they would have been on a more comprehensive basis. The dividend growth of successful mines was impressive. Failed ventures paid no dividends, yet failed ventures are seriously under-weighted in the large-cap rankings. Few appear there - only those that were able to raise a huge amount of capital in the first place (enough to get them into the top rankings with only the money raised from early public offerings, without the buttress of operating profitability) and yet despite the promise of such backing, were nevertheless unsuccessful. Compared with all mining ventures, the dividend growth (and dividend yield) of the long-term survivors alone was misleadingly large. Table 13 helps illustrate the point. Compare the current dividend yield of all ranking mines with those of three of the most successful in the group (or, in the case of Tharsis, the most long-lived, appearing in every benchmark since 1873, a kind of success). The all-mines group had an average dividend yield that is usually below the market weighted average of the successful and proven three. The most plausible explanation for this otherwise strange finding is that the current dividend yield of all large-cap mines as a group was temporarily depressed by those mines that had high valuations but paid little, if any, dividends. The 1903 benchmark, which among the benchmark years employed here captures most closely the peak of the pre-1914 mining boom, is a clear example of this phenomenon. Such transitory mines of course would

[22] For example, the Hong Kong Shanghai Bank (ranked 26 in 1913), which was the lowest ranking company that paid dividends greater than Maypole's, at £510,000, had a market capitalization, at £9.720m, some 31% greater than Maypole's.

fairly quickly drop out of the rankings, causing the dividend yield to rise (dividend paying mines remaining in the rankings while non-dividend payers dropped out.) while sustained dividend growth would fall, being made up only of the dividends of surviving mines, without the temporary boost afforded by sporadic payments made by exiting mines. Making the appropriate adjustments to the dividend yield and growth prospects for the industry as a whole (and not just the successful minority), would no doubt sharply reduce the estimated risk premiums for the mining industry from what appears in Table 15. Both dividend yield and dividend growth would fall. Since the benchmark interest rate would remain constant for any definition of the mining industry (all ventures r large-cap only), the risk premium must therefore fall.

Secondly, the sheer amount of money raised over a period of decades suggests a lower risk premium must have operated for the sector as a whole. Over £20.0m was raised for new ventures between 1883 and 1898 alone. Perhaps twice that amount of new money was raised in the 15 years between 1898 and 1913. The market capitalization of ultimately unsuccessful mines was £33m in 1903 alone. In contrast, B-M's called-up and its peak market capitalization was only £12.1m. While the risk premiums on the mining and chemicals sectors may have appeared similar using large-cap data, the volume of new money raised suggests otherwise: that mining risk premiums were lower. Lower risk premiums, however, did not mean neglect of risk. The relatively high dividend yields on successful mines denotes discerning caution. The number of winners in the sector also denotes discernment. Much was bet, and much was lost, but perhaps even more was gained.

6. Conclusion: Information Flows in Victorian Capital Markets

If one accepts the modifications of the of the risk premiums for the mining industry suggested in Section 5, reducing them in order to allow both for survivor bias and to recognize the extensive commitment of funds to an industry where many investments failed, it is not possible to make a blanket claim that Victorian capital markets systematically placed little value on entrepreneurial efforts in the sectors surveyed here. Nevertheless, considering the chemical industry, important segments of the banking

industry, and the experience of retailers like Maypole Dairies, it is clear that a wide range of important entrepreneurial activities were under-valued, at least relative to railways. What kind of story might explain extreme caution in some areas of great promise, but not others?

In considering this question, it is important at the outset to make clear that it is not concerned with the short-lived manias that beset Victorian (and other) capital markets from time to time, when caution was thrown to the wind and the risk premiums associated with some industries became sharply negative, in the sense that no plausible path of dividend growth could have justified the extreme prices some companies were able briefly to achieve in the absence of any dividends or even credible earnings. Such manias, for example, are well documented for electrical engineering and motor vehicles. But these outbursts of irrational exuberance did not last long enough to propel the beneficiaries of investor carelessness into the ranks of Britain's largest companies for any perceptible length of time, if at all.[23] Indeed, the mining industry had more than its share of recurring manias, but in mining, unlike electrical engineering and motor vehicles, viable, highly profitable companies also emerged. Investment discipline, if occasionally loosened, was never entirely abandoned in the mining industry. The interesting issue here is a longer-term one. In the case of B-M, for example, exemplary growth sustained over decades was only grudgingly acknowledged by a very slowly declining risk premium (also mirrored by the persistently high current dividend yield).

It might be useful to approach the matter by thinking in terms of information flows. For convenience, we might think of categories of obstacles (or the lack of obstacles) to information flow that might exist on the buy-side of the market and on the sell-side. We might suppose that the buy-side consisted of three groups of individuals: (1) those who

[23] Telegraph Construction and Maintenance Company [TCMC] (#102 1883) is a partial exception to this claim. TCMC became briefly involved in early lighting schemes in London. Although it achieved some success, the company grew wary of the growing complexity and voracious capital requirements of the new industry, and gradually withdrew from it over the decades of the 1880s. Moreover, the firm's base of operations always remained the telegraph industry. It was established in 1864, well before the brief electrical mania of 1880-82. Between 1890 and 1914, it paid out an impressive stream of dividends, but at the expense of future growth. The high-dividend strategy was in effect a means of slowly winding the company up.

were not interested in hearing of new, potentially risky investment opportunities; (2) those who could not hear, even if they had been potentially interested; (3) those who were interested and could act, albeit with varying degrees of skill.[24] If Category (3) individuals dominated the buy-side, it is very hard (if not impossible) to account for the observed structure of risk premiums. Therefore members of Categories (1) and (2) must have been present in relatively large numbers.

Into the first group might fall many wealth-holders whose interests were focused on things other than active, informed investment management, people who were sufficiently wealthy that, as long as a catastrophe (like the First World War) did not occur, they possessed sufficient income to live a comfortable, agreeable life concerned with perhaps an active social or political life. We might think of such people as satisficers, content to invest along well-established lines as long as some established, undemanding target income level was met. The legacy of the classical Industrial Revolution, combined with a high degree of inequality in the distribution of wealth, meant that there were unusually large numbers of such people in Britain. A sub-group in this category might be those particularly conscious of a long tradition of good investment returns. Such people would have been aware of fluctuating investment returns in the past, but had confidence that whatever difficulties arose would be only temporary. Investment strategies that had made them prosperous in the past would continue do so in the future, even if the present might sometimes seem unpromising. Essex arable farmers after 1880 would be an example of members of this sub-group. These men were not generally in the wealth elite, but they were not especially poor either. They were willing to wait fairly passively for an upturn in their traditional business, and could afford to do so. They were not stirred to seek out aggressively alternative investment opportunities, especially since this strategy was not without its own risks.

The second category – those who could not hear – were those whose investment decisions were governed by the Trustee laws. Such laws to prescribe prudence had a

[24] The partitioning of investors proposed here has been motivated in part by the literature on "noise trading". (For an introduction to this literature, see, for example, De Long, Shleifer, Summers, and Waldmann: 1990).

sensible intention, and perhaps in many cases saved those who were incapable of making informed choices from serious loss. But the laws also ensured that a large stock of wealth was confined to Consols, selected railway debentures and other low-yield securities. As a growing mass of wealth was transmitted across generations, more of Britain's investment funds were constrained by the Trustee laws. But such a simple, rigid rule was not adequate to the complex task of rational investment, leaving those subject to it, for example, badly exposed to inflation. Echoes of this dilemma can be heard today in debates over the guidelines for the management of pensions prescribing a minimum funding requirement and the form in which that requirement must be met (although now the existence of low cost index tracker funds make the current problem more manageable than its Victorian cognate).

The final category consists of those who were interested to learn of new investment opportunities. At least some of this group also took active steps to become well informed. The flow of funds into mining ventures suggests this group was not small. But why, of the wide range of growth opportunities of the late nineteenth century, was the mining industry so conspicuously dominant in new entrants to the rankings of Britain's largest firms? Perhaps part of the answer lies in experience. Although direct experience in gold or diamond mining was not common among them, many British investors had long experience with the mining of coal as well as base metals. The technology was reasonably well known and the value of a successful strike could be ascertained quickly, especially for gold, whose price in terms of currency was fixed by the Gold Standard. Harvey and Press (1989) describe a process by which domestic investment mining expertise was projected overseas. Long established experience might also explain the much more muted response to possibilities in science-based industries. In the case of these industries, unlike mining, there was no tradition of commercial exploitation. The value of discoveries was more difficult to ascertain and technological vision harder to develop. Consequently, perhaps it should not be surprising that scepticism should have

been greater and market valuations correspondingly lower. But perhaps part of the answer also lies on the sell-side of the capital markets.

The sell-side, like the buy-side, might be split into three categories: (1) those who were not interested in seeking out new ventures, perhaps because their existing securities businesses were good ones even if not growing very fast, but ones which might be harmed by ill-judged forays into new territory; (2) those who could not seek out new ventures, or could do so only with difficulty, because of limited experience or education; (3) those who would and could seek out new securities business. It may have been the case that inertia in category (1) on the sell-side was at least as great as that on the buy-side. One way of adjusting to dwindling demand at home in, say, government bond or railway securities was to find more attractive foreign substitutes to sell. That way expertise in analysing railways for example could be preserved. Moreover, by sticking to familiar business, hard-won reputations would not be squandered while exploring new markets. Sell-side inertia was certainly not a British preserve. In the U.S. for example, the Morgan partnership was the only leader in the railway securities market that was able to establish an equally successful position in the emerging industrial one (Navin and Sears: 1955). The other great railroad houses either stayed with the industry, and followed it into long-term decline, or came to grief in new markets.

A higher educational system that did not stress science and engineering affected the sell-side as well as the buy-side. In Britain, gaining first-hand knowledge of recent scientific and engineering advances was harder than in Germany, Sweden, Switzerland or the U.S., where more men were actively engaged in the research. But even so, one would have thought that British financiers would have exhibited more curiosity and initiative than they did. One way of illustrating this is to consider the introduction of electric light into Britain. As in other advanced countries, the wealthy in Britain were first intrigued by the possibilities and sought out inventors. The first house in Britain to be lit by electricity was Cragside, in Northumbria, the home of Sir William Armstrong, the industrialist and friend of Joseph Swan, the co-inventor of the incandescent lamp. But Swan's hydro installation at Cragside remained a curiosity. Armstrong's counterpart in the U.S., however, was not an industrialist, but a banker, J.P. Morgan, and Thomas

Edison's installation in Morgan's New York townhouse was one development in a process that eventually resulted in the formation of General Electric.

It would appear from this example – limited, but directly concerned with one of the great science-based industries of the day – that financiers in New York were more amenable to new ventures in electricity than their London counterparts were.[25] To be sure, when Edison finally had a system to demonstrate, he was well received by London money men, who enthusiastically backed his English lighting company, at least at first. Of course, an introduction from his New York backers helped greatly in securing British funding. But the London men were relatively new to the business, and more reluctant to back it when the inevitable problems of pioneering emerged. No British banker was as deeply involved in the industry as Morgan was, to the point where Morgan not only helped arrange mergers in the fledgling industry, but also took an active role in selecting the management of the companies he formed and floated. In the case of General Electric, created in 1892 by the merger of Thomson-Houston and Edison General Electric, this meant ensuring that the more technologically progressive management of Thomson-Houston dominated the new firm, while the personal of Edison General Electric, including Edison himself, were shunted aside. The degree of involvement of British financiers in electricity stands in stark contrast to their involvement in mining. This lack of involvement almost certainly translated into a higher risk premium for British electrical firms than that imposed on their American (and probably German) counterparts. For example, preliminary calculations of the risk premium accorded General Electric (GE) show it to be much lower than B-M's. Over some periods, the premium on the American company was found to be negative. However, the calculation of GE's premium is complicated by the fact that the company was forced to eliminate its dividend during the financial crisis of 1893 and did not restore it for five years. As we have seen above, zero dividends inevitably lower the risk premium. Nevertheless, despite a chequered dividend

[25] As we have seen above, London financiers were not especially interested in chemistry either, the other great science-based industry of the day. For Brunner, Monds' early reception in the City, see Reader (1970). Reader's account provides some explanation for B-M's persistently high dividend yield.

history, in marked contrast to B-M's smooth one, in 1913 GE's current dividend yield was 5.68%, compared with the U.S. railroad average of 5.20% (Cowles, 1939: Series Y-3 and Y-15), valuing GE's dividend stream at an 8.5% discount to the U.S. railroad average. In the same year, although B-M's current dividend yield, at 5.19%, was marginally lower than GE's, it stood at a 21.3% discount to the British rail market.

To what extent did the differing market reception of investment proposals depend not on the dispositions of financiers, but on the differing abilities of entrepreneurs themselves to articulate a credible vision of investment opportunities? Mining entrepreneurs, despite all the well-known risks – not for nothing did Mark Twain once describe a mine as a big hole in the ground with a liar standing beside it – seem to have been able to yell "Strike" with amazing credibility[26]. And, on the basis of their claims, they could raise new money with an ease few, if any, other sectors of the British economy could match. No doubt mining entrepreneurs were helped by a knowledgeable investor base, able to appreciate at an early stage key evidence of success. But mining entrepreneurs also seem to have been able to articulate their visions with a persuasiveness rarely matched elsewhere, and certainly not in the science-based industries.

A cultural element may be at work here. American entrepreneurs, faced with an abundance of resources but an acute shortage of capital, from a very early (still colonial) stage grew used to presenting their case to distant financiers, first in the coastal cities of the colonies, later to London and other European centres. An ability to project an investment vision was an integral part of their make-up. It came with the territory, so to speak. If they lacked this skill, they were condemned to remain in the remote wilderness, looking disconsolately at resources they knew were valuable but which they could not develop. And for their part, financiers were willing to listen, for who could know what fortunes might lies in the field and mountains of the American frontier? With a smaller natural resource base, and one more thoroughly explored, such a tradition of

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[26] I am indebted to Paul Johnson for the observation that entrepreneurs must bear at least some of the responsibility for communication problems.

communication was perhaps a less developed feature of British economic life. But mining might be the exception.

It is perhaps well to conclude with a note on the importance of dialogue between the two sides of the investment market, the buyers and the sellers. Problems they might have in communication help to explain why arbitrage is generally more difficult than one might have expected.[27] If the buy-side is sufficiently unreceptive, entrepreneurs with good projects are unlikely to attempt public offerings of securities in their ventures. The gap between their relatively well-informed private valuations of their ventures and what the less well informed public would be willing to pay is often too great to be bridged. But this often means good projects go unfunded or under-funded, and that the public offerings that do occur are dominated by "lemons", projects in which sellers attach low private valuations but seek to portray publicly as good ones deserving high valuations. If the sell-side is too cautious and too unresponsive to emerging opportunities, investors miss good opportunities, even if they are prepared to listen. But when communication problems are overcome, on-going dialogue holds out the promise of improving investment capabilities all around. Buyers are knowledgeable and appreciative. Sellers know that if they offer on average good projects, they will be rewarded (and correspondingly punished for too many "lemons"), and a virtuous circle is established and ventures flourish in a competently discerning environment.

[27] Intrinsic problems in effective arbitrage among investment opportunities, especially when pay-offs are in the more distant future, are concisely discussed in Shleifer and Vishny (1990).

Table 1: Top British companies in 1868 ranked by ordinary share market capitalization:

Rank	Year Created	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Ordinary dividend yield at market
1	1694	Bank of England	8140	(banks)	35218	35218	100.00	0	0.00	1.65
2	1846	London and North-Western Rly.	7100	(rails)	53028	34540	65.14	15372	28.99	5.18
3	1836	Lancashire & Yorkshire Rly.	7100	(rails)	22979	17833	77.61	5145	22.39	4.63
4	1844	Midland Rly.	7100	(rails)	27443	12814	46.69	9823	35.80	4.87
5	1854	North-Eastern Rly.	7100	(rails)	25733	8333	32.38	14478	56.26	9.52
6	1846	Great Northern Rly.	7100	(rails)	19572	8173	41.76	10436	53.32	5.05
7	1834	London & Sourth-Western Rly.	7100	(rails)	10889	7151	65.68	3737	34.32	4.89
8	1783	Bank of Ireland	8140	(banks)	6855	6855	100.00	0	0.00	3.72
9	1834	London and Westminster Bank	8140	(banks)	5988	5988	100.00	0	0.00	5.66
10	1845	Caledonian Rly.	7100	(rails)	13875	5685	40.97	7297	52.59	4.60
11	1836	South-Eastern Rly.	7100	(rails)	11178	5671	50.73	5507	49.27	4.04
12	1835	Great Western Rly.	7100	(rails)	23511	4213	17.92	14458	61.49	4.54
13	1853	Metropolitan Rly.	7100	(rails)	4795	4045	84.36	0	0.00	3.00
14	1844	Great South. & West. of Ireland Rly.	7100	(rails)	5391	4026	74.68	69	1.29	4.85
15	1695	Bank of Scotland	8140	(banks)	3750	3750	100.00	0	0.00	4.80
16	1846	London, Brighton and South Coast Rly.	7100	(rails)	11275	3539	31.39	7736	68.61	0.43
17	1727	Royal Bank of Scotland	8140	(banks)	3460	3460	100.00	0	0.00	4.62
18	1833	National Provincial Bank of England	8140	(banks)	3411	3411	100.00	0	0.00	7.92
19	1844	North British Rly.	7100	(rails)	9453	3205	33.90	2736	28.94	0.00
20	1862	Great Eastern Rly.	7100	(rails)	11432	3042	26.61	5889	51.51	0.00
21	1837	Glasgow and South-Western Rly.	7100	(rails)	5084	3022	59.45	608	11.96	5.44
22	1835	National Bank of Ireland	8140	(banks)	2988	2988	100.00	0	0.00	6.78
23	1840	Peninsular and Oriental Steamship Co.	7400	(ships)	2910	2910	100.00	0	0.00	2.78
24	1824	Imperial Continental Gas	1620	(gas)	2772	2772	100.00	0	0.00	7.07
25	1839	Union Bank of London Bank	8140	(banks)	2720	2720	100.00	0	0.00	8.82
26	1838	London and St Katherine Docks	7630	(docks)	3736	2706	72.42	1031	27.58	5.85
27	1836	London Joint Stock Bank	8140	(banks)	2680	2680	100.00	0	0.00	6.46
28	1810	Commercial Bank of Scotland	8140	(banks)	2575	2575	100.00	0	0.00	5.05
29	1825	National Bank of Scotland	8140	(banks)	2510	2510	100.00	0	0.00	4.78
30	1837	Union Bank of Australia	8140	(banks)	2475	2475 [1]	100.00	0	0.00	8.59
31	1746	British Linen Company	8140	(banks)	2465	2465	100.00	0	0.00	5.27
32	1838	East and West India Docks	7630	(docks)	2376	2376 [2]	100.00	0	0.00	6.09
33	1836	London and County Bank	8140	(banks)	2306	2306	100.00	0	0.00	9.76

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Rank	Year Created	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Ordinary dividend yield at market
34	1829	Manchester and Liverpool Dist. Bank	8140	(banks)	2220	2220	100.00	0	0.00	7.41
35	1864	John Crossley and Sons [carpets]	2210	(misc)	2200	2200 [3]	100.00	0	0.00	7.50
36	1720	Royal Exchange Insurance	8200	(insur)	2068	2068	100.00	0	0.00	6.67
37	1853	London, Chatham and Dover Rly.	7100	(rails)	3106	2037	65.59	420	13.53	0.00
38	1830	Union Bank of Scotland	8140	(banks)	2020	2020	100.00	0	0.00	4.95
39	1846	North London Rly.	7100	(rails)	2691	1987	73.85	0	0.00	4.64
40	1825	Provincial Bank of Ireland	8140	(banks)	1964	1964 [4]	100.00	0	0.00	5.50
41	1849	Manchester, Sheffield & Linc Rly. [a]	7100	(rails)	5559	1878	33.78	3681	66.22	3.51
42	1847	North Staffordshire Rly.	7100	(rails)	3453	1873	54.25	0	0.00	6.03
43	1856	National Discount Company	8150	(invest)	1800	1800 [5]	100.00	0	0.00	7.11
44	1838	Clydesdale Bank	8140	(banks)	1782	1782	100.00	0	0.00	5.05
45	1836	Taff Vale Rly.	7100	(rails)	1729	1729	100.00	0	0.00	4.31
46	1853 [b]	Electrical and International Telegraph	7902	(teleg)	1722	1722	100.00	0	0.00	5.92
47	1720	London Assurance Co.	8200	(insur)	1721	1721	100.00	0	0.00	5.21
48	1806	Rock Life (Insurance)	8200	(insur)	1700	1700 [6]	100.00	0	0.00	4.41
49	1836	Bristol and Exeter Rly.	7100	(rails)	3251	1679 [7]	51.64	0	0.00	5.27
50	1826	Imperial Gas Co.	1620	(gas)	1671	1671 [8]	100.00	0	0.00	7.78
51	1835	Bank of Australasia	8140	(banks)	1605	1605	100.00	0	0.00	8.41
52	1824	Indemnity Marine Assurance Co.	8200	(insur)	1587	1587 [9]	100.00	0	0.00	10.59
53	1838	City of Glasgow Bank	8140	(banks)	1353	1353 [10]	100.00	0	0.00	4.60
54	N/a	Hull and Selby Rly.	7100	(rails)	1344	1344 [11]	100.00	0	0.00	5.16
55	1845	Midland & Great Western of Ireland Rly.	7100	(rails)	1550	1327	85.58	0	0.00	4.27
56	1807	East London Waterworks	1700	(water)	1326	1326	100.00	0	0.00	5.81
57	1844	Furness Rly.	7100	(rails)	2305	1315 [12]	57.07	989	42.93	3.24
58	1839	London & Blackwall Rly.	7100	(rails)	1538	1313 [13]	85.37	225	14.63	5.00
59	1831	Bank of Liverpool	8140	(banks)	1150	1150	100.00	0	0.00	7.61
60	1852	London Chartered Bank of Australia	8140	(banks)	1150	1150 [14]	100.00	0	0.00	6.96
61	1806	West Middlesex Waterworks	1700	(water)	1131	1131	100.00	0	0.00	1.82
62	1839	Royal Mail Steamship Co.	7400	(ships)	1065	1065 [15]	100.00	0	0.00	5.70
63	1863	General Credit and Discount Co.	8150	(invest)	1050	1050 [16]	100.00	0	0.00	7.14
64	1868	Ebbw Vale Steel, Iron and Coal	1113	(coal)	1043	1043 [17]	100.00	0	0.00	1.79
65	1821	Guardian (Insurance) Co.	8200	(insur)	1005	1005	100.00	0	0.00	4.98
66	1836	Marine Insurance Co.	8200	(insur)	1005	1005 [18]	100.00	0	0.00	7.97
67	1863	Consolidated Bank	8140	(banks)	988	988 [19]	100.00	0	0.00	4.05
68	1824	Phoenix Gas Co.	1620	(gas)	976	976 [20]	100.00	0	0.00	9.04
69	1836	Royal Bank of Ireland	8140	(banks)	971	971 [21]	100.00	0	0.00	4.32

Table 1: Top British companies in 1868 ranked by ordinary share market capitalization:

Rank	Year Created	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Ordinary dividend yield at market
70	1803	Imperial Fire Insurance Co.	8200	(insur)	950	950 [22]	100.00	0	0.00	5.31
71	1865	Surrey Commercial Dock	7630	(docks)	937	937 [23]	100.00	0	0.00	5.66
72	1831	Gloucestershire Bank	8140	(banks)	905	905 [24]	100.00	0	0.00	6.63
73	N/a	Birmingham and Staffordshire Gas Co.	1620	(gas)	895	895 [25]	100.00	0	0.00	4.94
74	1836	Ulster Rly.	7100	(rails)	986	886 [26]	89.85	0	0.00	4.51
75	1823	Law Life Insurance Co.	8200	(insur)	885	885 [27]	100.00	0	0.00	4.26
76	1793	Grand Junction Canal	7610	(canal)	933	821 [28]	88.07	0	0.00	5.52
77	1834	West of Eng. & S. Wales District Bank	8140	(banks)	800	800 [29]	100.00	0	0.00	7.50
78	1859	Ocean Marine Insurance Co.	8200	(insur)	800	800 [30]	100.00	0	0.00	7.50
79	1818 [c]	Westminster Chartered Gas	1620	(gas)	795	795 [31]	100.00	0	0.00	8.19
80	1836	Colonial Bank	8140	(banks)	770	770	100.00	0	0.00	7.79
81	1862	Manchester and County Bank	8140	(banks)	770	770	100.00	0	0.00	6.23
82	1827	Belfast Banking Company	8140	(banks)	765	765 [32]	100.00	0	0.00	4.93
83	1858	National Bank of Australasia	8140	(banks)	743	743 [33]	100.00	0	0.00	9.09
84	1867	National Steamship Co.	7400	(ships)	781	731 [34]	93.60	0	0.00	3.08
85	1836	Ulster Banking Company	8140	(banks)	706	706	100.00	0	0.00	5.19
86	1723	Chelsea Waterworks	1700	(water)	705	705	100.00	0	0.00	5.13
87	1809	North British and Mercantile Insurance	8200	(insur)	700	700	100.00	0	0.00	4.29
88	1835	Union Bank of Liverpool	8140	(banks)	698	698 [35]	100.00	0	0.00	6.45
89	1831	Dublin and Kingstown Rly.	7100	(rails)	697	697 [36]	100.00	0	0.00	4.77
90	1845	Royal Insurance Co.	8200	(insur)	694	694	100.00	0	0.00	5.04
91	1847	South Yorkshire and River Don Rly.	7100	(rails)	1871	690 [37]	36.89	874	46.75	5.10
92	1844	South Devon Rly.	7100	(rails)	689	689 [38]	100.00	0	0.00	4.62
93	1864	The Bradford Old Bank	8140	(banks)	686	686 [39]	100.00	0	0.00	6.34
94	1843	Yorkshire Banking Co.	8140	(banks)	685	685 [40]	100.00	0	0.00	7.01
95	1826	Lancaster Banking Co.	8140	(banks)	680	680 [41]	100.00	0	0.00	7.17
96	1836	Liverpool & London Globe Insurance	8200	(insur)	678	678 [42]	100.00	0	0.00	7.74
97	1845	Dublin and Belfast Junction Rly.	7100	(rails)	670	670 [43]	100.00	0	0.00	5.21
98	1850 [d]	Brit. & Irish Magnetic Telegraph Co.	7902	(teleg)	662	662 [44]	100.00	0	0.00	5.84
99	1835	Wilts and Dorset Banking Co.	8140	(banks)	655	655	100.00	0	0.00	6.41
100	1825	Standard Life Insurance Co.	8200	(insur)	650	650 [45]	100.00	0	0.00	4.62
101	1864	Credit Foncier of England	8150	(inves)	650	650 [46]	100.00	0	0.00	4.62
102	1862	London & River Plate Bank	8140	(banks)	645	645	100.00	0	0.00	11.63
103	1836	North and South Wales Bank	8140	(banks)	645	645	100.00	0	0.00	6.98
104	1846	Monmouthshire Railway & Canal Co.	7100	(rails)	971	640 [47]	65.92	0	0.00	6.81
105	1832	Commercial Bank of Liverpool	8140	(banks)	634	634 [48]	100.00	0	0.00	6.07

Table 1: Top British companies in 1868 ranked by ordinary share market capitalization:

Rank	Year Created	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Ordinary dividend yield at market
106	1824	Alliance, British & Foreign Insurance	8200	(insur)	625	625	100.00	0	0.00	6.16
107	1836	North of Scotland Bank	8140	(banks)	620	620 [49]	100.00	0	0.00	4.52
108	1811	Grand Junction Waterworks	1700	(water)	616	616	100.00	0	0.00	5.36
109	1805	Caledonian Fire and Life Insurance	8200	(insur)	615	615 [50]	100.00	0	0.00	3.90
110	1812	Regent's (or London) Canal Co.	7610	(canal)	615	615 [51]	100.00	0	0.00	5.56
111	1827	Bradford Banking Company	8140	(banks)	607	607 [52]	100.00	0	0.00	7.83
112	1865	East London Rly.	7100	(rails)	602	602 [53]	100.00	0	0.00	13.95
113	1855	City Bank	8140	(banks)	600	600	100.00	0	0.00	7.08
114	1840	Dublin and Droghedra Rly.	7100	(rails)	879	600 [54]	68.20	280	31.80	4.92
115	1865	Highland Railway (Rly).	7100	(rails)	1617	597	36.89	0	0.00	2.80
116	1833 [e]	London Gas	1620	(gas)	596	596 [55]	100.00	0	0.00	5.88
117	1845	Southwark and Vauxhall Water Co.	1700	(water)	587	587 [56]	100.00	0	0.00	5.60
118	1836	Union Bank of Manchester	8140	(banks)	580	580 [57]	100.00	0	0.00	8.16
119	1825	Hibernian Banking Company	8140	(banks)	578	578 [58]	100.00	0	0.00	3.68
120	1833	Commerical Gas Co.	1620	(gas)	577	577	100.00	0	0.00	7.58
121	1785	Lambeth Waterworks	1700	(water)	577	577	100.00	0	0.00	5.86
122	1861	Birmingham Joint Stock Bank	8140	(banks)	576	576 [59]	100.00	0	0.00	7.08
123	1824	Scottish Union Insurance Co.	8200	(insur)	571	571 [60]	100.00	0	0.00	4.55
124	1809	Kent Waterworks	1700	(water)	570	570	100.00	0	0.00	4.71
125	1865	Lloyd's Banking Co.	8140	(banks)	569	569	100.00	0	0.00	6.70

Notes

[a] Later known as Great Central Rly.
[b] Based on information from Charles Bright (1898) *Submarine Telegraphs*, p.16.
[c] Taken as the earlier formation date of the two predecessor companies, the Westminster Gas Company and the Chartered Gas Company, based on Sterling Everard, (1949), *The History of the Gas Light and Coke Company*.
[d] An estimate based on information from Charles Bright (1898), *Submarine Telegraphs*, p.5.
[e] Based on information from Sterling Everard (1949), *The History of the Gas Light and Coke Company*, p.102.

[Cont.]

5. By 1898, no longer quoted in *IMM*
6. At £900, below the 1898 cut off of £1,875
7. The Bristol and Exeter Railway amalgamated with the Great Western Railway in 1876
8. Imperial Gas merged with Gas Light and Coke in June 1876
9. Bought out by the London Joint Stock Bank in 1893
10. At £288, below the 1898 cut off of £1,875
11. Incorporated into the North Easter Railway
12. At £1,731, below the cut off of £1,875
13. London and Blackwell equity no longer separately quoted because of links to the Great Eastern Railway
14. By 1898, no longer quoted in *IMM*
15. At £765, below the 1898 cut off of £1,875
16. No price quoted in June 1898
17. At £366, below the 1898 cut off of £1,875
18. At £1,760, below the 1898 cut off of £1,875

[1868 Notes cont.]

[1868 Notes cont.]

19. Merged with Parr's Bank
20. Absorbed, by South Metropolitan Gas, April 1880
21. At £893, below the 1898 cut off of £1,875
22. Bought out by London Joint Stock Company in 1893
23. At £1,724, below the 1898 cut off of £1,875
24. By 1898, no longer quoted in *IMM*
25. Purchased by Birmingham Corporation for annuities in 1875
26. By 1898, no longer quoted in *IMM*

42. At £128, below the 1898 cut off of £1,875
43. Merged with the Dublin and Droghedra Rly in 1875 as part of the formation of the Great Northern of Ireland Rly.
44. By 1898, no longer quoted in *IMM*
45. At £520, below the 1898 cut off of £1,875.
46. By 1898, no longer quoted in *IMM*
47. By 1898, no longer quoted in *IMM*
48. By 1898, no longer quoted in *IMM*
49. At £1,031, below the 1898 cut off of £1,875.
50. At £753, below the 1898 cut off of £1,875.
51. By 1898, no longer quoted in *IMM*
52. At £959, below the 1898 cut off of £1,875
53. At £243, below the 1898 cut off of £1,875.
54. Merged with the Dublin and Belfast Junction Rly. in 1875 as part of the formation of the Great Northern of Ireland Rly.

[1868 Notes cont.]

END OF TABLE 1

Table 2: Top British Companies in 1883 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
1	London and N. Western Rly.	7100	(rails)	135449	65566	48.41	69884	51.59	4.33
2	Bank of England	8140	(banks)	43222	43222	100.00	0	0.00	3.54
3	North-Eastern	7100	(rails)	76339	39122	51.25	15171	19.87	4.69
4	Midland	7100	(rails)	89333	32778	36.69	28151	31.51	4.19
5	Great Western	7100	(rails)	91483	24886	26.91	52117	56.35	4.62
6	Lancashire & Yorkshire	7100	(rails)	41208	18964	46.02	9736	23.63	3.93
7	Great Northern	7100	(rails)	43857	14740	33.61	11492	26.20	3.32
8	South-Eastern	7100	(rails)	27506	12776	46.45	8126	29.54	3.91
9	London and S. Western	7100	(rails)	30092	12727	42.29	8114	26.96	4.37
10	Caledonian	7100	(rails)	34510	11688	33.87	13673	39.62	4.18
11	Great Eastern	7100	(rails)	41656	11105	26.66	21557	51.75	1.89
12	Gas Light and Coke	1620	(misc)	15112	10273	67.98	1420	9.40	6.16
13	London and Westminster	8140	(banks)	9660	9660	100.00	0	0.00	5.22
14	Bank of Ireland	8140	(banks)	9585	9585	100.00	0	0.00	3.76
15	National Provincial Bank of England	8140	(banks)	8957	8957	100.00	0	0.00	2.81
16	London, Brighton and South Coast	7100	(rails)	28751	8742	30.40	9475	32.95	3.71
17	London and County	8140	(banks)	8050	8050	100.00	0	0.00	4.41
18	Rio Tinto	2100	(mines)	9414	6988	74.22	2427	25.78	6.51
19	Metropolitan	7100	(rails)	12008	6287	52.36	2955	24.61	4.20
20	Glasgow and S.W.	7100	(rails)	12520	6082	48.58	3361	26.85	4.49
21	Great S & W of Ireland	7100	(rails)	8837	6077	68.76	2760	31.24	3.89
22	North British	7100	(rails)	30784	5937	19.28	9592	31.16	2.83
23	Imperial Continental Gas	1620	(misc)	5600	5600	100.00	0	0.00	6.00
24	Manchester, Sheffield & Linc	7100	(rails)	28950	4907	16.95	15371	53.10	3.08
25	London Joint Stock	8140	(banks)	4840	4840	100.00	0	0.00	4.21
26	Union Bank of London	8140	(banks)	4495	4495	100.00	0	0.00	4.85
27	Union Bank of Australia	8140	(banks)	4380	4380	100.00	0	0.00	5.82
28	Royal Bank of Scotland	8140	(banks)	4300	4300	100.00	0	0.00	4.53
29	Eastern Telegraph, Limited	7902	(teleg)	5920	4085	69.00	908	15.33	4.65
30	Great Northern of Ireland	7100	(rails)	7411	4069	54.91	2423	32.70	3.70
31	Tharsis Sulphur and Copper	2100	(mines)	3964	3964	100.00	0	0.00	8.15
32	Bank of Scotland	8140	(banks)	3875	3875	100.00	0	0.00	4.35
33	National	8140	(banks)	3769	3769	100.00	0	0.00	4.38
34	South Metropolitan Gas	1620	(misc)	3751	3672	98.89	79	2.11	5.99

Table 2: Top British Companies in 1883 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
35	Furness	7100	(rails)	7670	3540	46.16	2420	31.56	5.22
36	Peninsular and Oriental Steam	7400	(ships)	3450	3450	100.00	0	0.00	5.80
37	Manchester & Liverpool District	8140	(banks)	3428	3428	100.00	0	0.00	5.28
38	North London	7100	(rails)	5788	3407	58.87	1186	20.50	4.35
39	Taff Vale	7100	(rails)	6047	3307	54.68	1935	31.99	6.36
40	East London Waterworks	1620	(misc)	3272	3272	100.00	0	0.00	3.63
41	British Linen Company	8140	(banks)	3050	3050	100.00	0	0.00	4.59
42	London Chatham & Dover	7100	(rails)	17019	3045	17.89	8205	48.21	0.00
43	West Middlesex Waterworks	1620	(misc)	2944	2944	100.00	0	0.00	3.92
44	Royal	8200	(insur)	2925	2925	100.00	0	0.00	4.28
45	Bank of Australasia	8140	(banks)	2885	2885	100.00	0	0.00	7.63
46	Royal Exchange, Fire Life and Mar	8200	(insur)	2860	2860	100.00	0	0.00	4.82
47	N. Staffordshire	7100	(rails)	8496	2818	33.17	3693	43.47	3.72
48	Commercial Bank of Scotland	8140	(banks)	2763	2763	100.00	0	0.00	5.07
49	Mason & Barry Limited	2100	(mines)	2685	2685	100.00	0	0.00	8.62
50	Bolckow, Vaughan & Co, Lim	2210	(iron)	3060	2650	86.60	0	0.00	7.09
51	Sun Fire	8200	(insur)	2616	2616	100.00	0	0.00	5.20
52	London & St. Katherine Docks	7630	(docks)	3970	2475	62.36	1078	27.17	5.23
53	Clydesdale	8140	(banks)	2400	2400	100.00	0	0.00	5.21
54	Union Bank of Scotland	8140	(banks)	2388	2388	100.00	0	0.00	5.03
55	Eastern Exten., A & China Tel	7902	(teleg)	3476	2347	67.52	1129	32.48	5.11
56	Hong Kong and Shanghai Corp	8140	(banks)	2280	2280	100.00	0	0.00	10.53
57	City	8140	(banks)	2180	2180	100.00	0	0.00	3.90
58	Midland and Gt Western of Ireland	7100	(rails)	4503	2133	47.37	1498	33.28	3.89
59	East and West India Dock	7630	(docks)	3001	2099	69.94	902	30.06	4.83
60	London Assur Corp	8200	(insur)	2080	2080	100.00	0	0.00	5.17
61	Manchester and County, Limited	8140	(banks)	2024	2024	100.00	0	0.00	5.05
62	Standard Bank of British S.A	8140	(banks)	2000	2000	100.00	0	0.00	5.50
63	Pacific Steam Navigation	7400	(ships)	1972	1972	100.00	0	0.00	5.99
64	Great Northern Telegraph	7902	(teleg)	2360	1950	82.63	410	17.37	4.23
65	Leeds and Liverpool Canal	7610	(canal)	1932	1932	100.00	0	0.00	4.37
66	Imperial Fire	8200	(insur)	1925	1925	100.00	0	0.00	4.36
67	Armstrong, Mitchell & Co	2210	(iron)	1880	1880	100.00	0	0.00	0.00
68	Alliance British and Foreign	8200	(insur)	1825	1825	100.00	0	0.00	4.52
69	New River	1620	(misc)	3179	1825	57.41	1354	42.59	3.22
70	National Discount Lim	8140	(banks)	1743	1743	100.00	0	0.00	6.34

Table 2: Top British Companies in 1883 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
71	North and South Wales	8140	(banks)	1681	1681	100.00	0	0.00	5.20
72	Phoenix Fire	8200	(insur)	1681	1681	100.00	0	0.00	4.20
73	Manchester and Salford	8140	(banks)	1639	1639	100.00	0	0.00	5.22
74	Vickers, Sons & Co Limited	2210	(iron)	1635	1635	100.00	0	0.00	6.19
75	Highland	7100	(rails)	4070	1632	40.09	1118	27.46	4.38
76	Rock Life	8200	(insur)	1600	1600	100.00	0	0.00	5.31
77	Bank of Liverpool	8140	(banks)	1588	1588	100.00	0	0.00	5.51
78	Kent Waterworks	1620	(misc)	1579	1579	100.00	0	0.00	9.08
79	Southwark and Vauxhall	1620	(misc)	1575	1575	100.00	0	0.00	4.41
80	Brazilian Submarine Tel	7902	(teleg)	1544	1544	100.00	0	0.00	5.89
81	Surrey Commercial Dock	1620	(misc)	2262	1544	68.24	160	7.06	5.00
82	Lloyd's Banking	8140	(banks)	1524	1524	100.00	0	0.00	6.43
83	Wilts and Dorset Banking	8140	(banks)	1523	1523	100.00	0	0.00	5.06
84	Ulster Banking Company	8140	(banks)	1515	1515	100.00	0	0.00	3.96
85	Parr's Banking Company	8140	(banks)	1514	1514	100.00	0	0.00	5.56
86	Anglo-American Telegraph	7902	(teleg)	3502	1512	43.17	0	0.00	3.85
87	John Crossley and Sons	9999	(misc)	1500	1500	100.00	0	0.00	7.00
88	Consolidated Limited	8140	(banks)	1475	1475	100.00	0	0.00	5.42
89	Provincial Bank of Ireland	8140	(banks)	1429	1429	100.00	0	0.00	4.16
90	Maryport and Carlisle	7100	(rails)	1480	1400	94.64	79	5.36	5.82
91	Colonial	8140	(banks)	1380	1380	100.00	0	0.00	6.96
92	Liverpool Union Bank	8140	(banks)	1380	1380	100.00	0	0.00	5.43
93	Consett Iron, Limited	2210	(iron)	1369	1369	100.00	0	0.00	6.03
94	Northern Assurance, Fire and Life	8200	(insur)	1365	1365	100.00	0	0.00	4.40
95	Commercial Gas	1620	(misc)	1432	1356	94.70	76	5.30	5.94
96	Preston and Wyre	7100	(rails)	1432	1333	93.13	0	0.00	3.77
97	North Metropolitan Tramways	7210	(trams)	1328	1328	100.00	0	0.00	5.36
98	Chelsea Waterworks	1620	(misc)	1326	1326	100.00	0	0.00	3.65
99	Dunville and Company Limited	9999	(misc)	1325	1325	100.00	0	0.00	7.55
100	Liverpool United Gas Light	1620	(misc)	1479	1291	87.27	188	12.73	5.97
101	Metropolitan District	7100	(rails)	6837	1283	18.76	3897	57.00	0.66
102	Telegraph Construction and Main	7902	(teleg)	16701	1270	7.60	15431	92.40	7.06
103	Hull, Barnsley and W. Riding	7100	(rails)	1244	1244	100.00	0	0.00	12.06
104	Regent's Canal City and Docks	7610	(canal)	1237	1237	100.00	0	0.00	0.00
105	Sheffield United Gas Light	1620	(misc)	1228	1228	100.00	0	0.00	4.86
106	Bradford Old Bank, Lim	8140	(banks)	1213	1213	100.00	0	0.00	4.64

Table 2: Top British Companies in 1883 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
107	Rylands and Sons, Limited	9999	(misc)	1200	1200	100.00	0	0.00	6.25
108	Hull Docks	7630	(docks	2556	1200	46.94	1356	53.06	5.41
109	Alliance and Dublin	1620	(misc)	1192	1192	100.00	0	0.00	4.95
110	Grand Junction Canal	7610	(canal)	1287	1158	89.99	0	0.00	3.90
111	London, Til. & Southend	7100	(rails)	1429	1148	80.35	281	19.65	3.73
112	Law Life	8200	(insur)	1140	1140	100.00	0	0.00	3.73
113	Marine	8200	(insur)	1140	1140	100.00	0	0.00	6.14
114	Norwich Union Fire	8200	(insur)	1100	1100	100.00	0	0.00	5.00
115	British India Steam Nav	7400	(ships)	1095	1095	100.00	0	0.00	5.41
116	Cunard Steamship Limited	7400	(ships)	1093	1093	100.00	0	0.00	5.86
117	Alliance, Limited	8140	(banks)	1080	1080	100.00	0	0.00	5.19
118	English, Scot & Austr. Chartered	8140	(banks)	1080	1080	100.00	0	0.00	5.67
119	Birmingham Joint Stock, Limited	8140	(banks)	1073	1073	100.00	0	0.00	5.59
120	British and Foreign Marine	8200	(insur)	1056	1056	100.00	0	0.00	3.79
121	Munster Limited	8140	(banks)	1050	1050	100.00	0	0.00	5.00
122	North of Scotland	8140	(banks)	1050	1050	100.00	0	0.00	4.76
123	Thames and Mersey Marine	8200	(insur)	1050	1050	100.00	0	0.00	5.71
124	Bradford Banking Company	8140	(banks)	1047	1047	100.00	0	0.00	5.19
125	Indemnity Marine Assurance	8200	(insur)	1039	1039	100.00	0	0.00	6.77

Table 3: Top British companies in 1898 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
1	London & N. Western	7100	(rail)	182100	81525	44.77	100575	55.23	3.57
2	Midland	7100	(rail)	151906	61366	40.40	49045	32.29	1.85
3	Bank of England	8140	(bank)	50863	50863	100.00	0	0.00	2.86
4	North-Eastern	7100	(rail)	106051	49541	46.71	37249	35.12	3.56
5	Great Western	7100	(rail)	138829	40559	29.21	76510	55.11	3.61
6	London & S. Western	7100	(rail)	61891	26811	43.32	15669	25.32	3.08
7	Caledonian	7100	(rail)	65839	24803	37.67	25834	39.24	3.23
8	Lancashire & Yorkshire	7100	(rail)	73734	24614	33.38	23301	31.60	3.49
9	Great Northern	7100	(rail)	62652	21376	34.12	21607	34.49	2.76
10	De Beers Cons L	2100	(mine)	24869	21323	85.74	3546	14.26	7.41
11	Coats, J. & P., Limited	9999	(misc)	24770	18000	72.67	2270	9.16	3.33
12	Gas Light and Coke	1620	(misc)	28253	17443	61.74	3760	13.31	4.33
13	South-Eastern	7100	(rail)	66610	15375	23.08	41880	62.87	4.05
14	Great Northern of Ireland	7100	(rail)	20867	15204	72.86	3964	19.00	1.51
15	Great Eastern	7100	(rail)	67714	15182	22.42	32371	47.81	2.07
16	London, Brighton & S. Coast	7100	(rail)	43718	15110	34.56	13212	30.22	3.67
17	Guinness, Arthur, & Co L	4270	(brew)	20340	14750	72.52	1800	8.85	3.39
18	National Prov. Bank of England	8140	(bank)	14383	14383	100.00	0	0.00	3.13
19	Bank of Ireland	8140	(bank)	11550	11550	100.00	0	0.00	2.99
20	Armstrong (Sir WG). Whitworth & Co	2210	(iron)	10703	10232	95.60	0	0.00	4.18
21	North British	7100	(rail)	57851	10202	17.64	22868	39.53	2.69
22	London and County Banking	8140	(bank)	10100	10100	100.00	0	0.00	4.36
23	Rand Mines	2100	(mine)	9815	9815	100.00	0	0.00	0.00
24	Metropolitan	7100	(rail)	19237	9296	48.32	4735	24.61	2.13
25	Rio Tinto	2100	(mine)	14009	8450	60.22	3589	25.62	7.69
26	London & Westminster	8140	(bank)	8050	8050	100.00	0	0.00	4.35
27	Lloyds Bank Limited	8140	(bank)	8033	8033	100.00	0	0.00	4.44
28	Imperial Continental Gas	1620	(misc)	45908	7961	17.34	37947	82.66	4.77
29	South Metropolitan	1620	(misc)	9268	7771	83.85	1497	16.15	3.74
30	Glasgow and S.W.	7100	(rail)	38681	7302	18.88	25351	65.54	1.69
31	Gt. S. & Western of Ireland	7100	(rail)	12443	7233	58.13	5210	41.87	3.69
32	Eastern Telegraph, Limited	7902	(tele)	10212	7000	68.55	1882	18.43	3.57
33	Royal	8200	(insu)	6825	6825	100.00	0	0.00	3.49
34	London & Midland	8140	(bank)	6223	6223	100.00	0	0.00	4.01

Table 3: Top British companies in 1898 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
35	British Linen Company	8140	(bank)	6125	6125	100.00	0	0.00	3.67
36	Parr's Bank, Lim	8140	(bank)	5907	5907	100.00	0	0.00	4.25
37	Cons. Gold Fields of S.A	2100	(mine)	7617	5653	74.21	636	8.35	11.94
38	Manchester and Liverpool District	8140	(bank)	5250	5250	100.00	0	0.00	3.81
39	Goldfields Deep	2100	(mine)	5063	5063	100.00	0	0.00	0.00
40	Great Central	7100	(rail)	23774	4779	20.10	2534	10.66	0.86
41	Mount Morgan	2100	(mine)	4688	4688	100.00	0	0.00	6.40
42	Royal Bank of Scotland	8140	(bank)	4630	4630	100.00	0	0.00	3.46
43	N. Brit. Mercantile Fire and Life	8200	(insu)	4620	4620	100.00	0	0.00	3.57
44	North London	7100	(rail)	7765	4536	58.42	1615	20.80	3.34
45	Great Northern Telegraph	7902	(tele)	4662	4500	95.62	162	3.48	3.33
46	P & O Steam Navigation	7400	(ship)	5402	4466	82.67	936	17.33	3.38
47	Eastern Ext, Australasia and China	7902	(tele)	5009	4438	88.58	572	11.42	3.94
48	Bank of Scotland	8140	(bank)	4413	4413	100.00	0	0.00	3.40
49	Robinson	2100	(mine)	4400	4400	100.00	0	0.00	4.69
50	Commercial of Scotland	8140	(bank)	4300	4300	100.00	0	0.00	3.72
51	National of Scotland Lim	8140	(bank)	4150	4150	100.00	0	0.00	3.86
52	N. Staffordshire	7100	(rail)	12452	4102	32.95	5182	41.61	3.44
53	London Joint Stock Limited	8140	(bank)	4080	4080	100.00	0	0.00	4.41
54	Taff Vale	7100	(rail)	8224	4063	49.40	1458	17.72	4.31
55	Rylands and Sons Limited	9999	(misc)	4043	4043	100.00	0	0.00	5.01
56	East London Waterworks	1700	(wate)	5371	3914	72.87	1457	27.13	3.41
57	Tharsis Sulphur and Copper	2100	(mine)	3906	3906	100.00	0	0.00	4.00
58	Union Bank of London	8140	(bank)	3850	3850	100.00	0	0.00	4.65
59	Simmer and Jack Proprietary	2100	(mine)	4318	3813	88.30	505	11.70	0.00
60	Capital and Counties Lim	8140	(bank)	3777	3777	100.00	0	0.00	3.95
61	Brunner, Mond and Co. Ltd	9999	(misc)	4635	3693	79.68	0	0.00	6.44
62	Hong Kong and Shanghai Corp	8140	(bank)	3680	3680	100.00	0	0.00	5.43
63	East Rand	2100	(mine)	3516	3516	100.00	0	0.00	0.00
64	Manchester and County	8140	(bank)	3324	3324	100.00	0	0.00	2.94
65	Williams, Deacon & Manch & Salt	8140	(bank)	3242	3242	100.00	0	0.00	3.86
66	Bank of Liverpool Limited	8140	(bank)	3210	3210	100.00	0	0.00	4.05
67	London and St. Katherine Docks	7630	(dock)	9273	3109	33.52	4589	49.49	4.63
68	National, Limited	8140	(bank)	3075	3075	100.00	0	0.00	4.39
69	London and River Plate	8140	(bank)	3060	3060	100.00	0	0.00	5.88
70	Wilts & Dorset Banking L	8140	(bank)	3000	3000	100.00	0	0.00	4.00

Table 3: Top British companies in 1898 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
71	Nobel Dynamite Trust, Limited	9999	(misc)	2982	2982	100.00	0	0.00	7.06
72	Consett Iron Limited	2210	(iron)	2900	2900	100.00	0	0.00	5.17
73	European Gas Limited	1620	(misc)	2836	2836	100.00	0	0.00	2.92
74	Mysore Gold Mining L	2100	(mine)	2750	2750	100.00	0	0.00	11.36
75	Barry	7100	(rail)	6328	2735	43.23	1093	17.27	3.59
76	Sun Insurance Office	8200	(insu)	2700	2700	100.00	0	0.00	3.33
77	Union Bank of Scotland L	8140	(bank)	2675	2675	100.00	0	0.00	4.11
78	Natl. Telephone	7902	(tele)	5177	2665	51.48	1376	26.58	5.45
79	Chelsea Waterworks	1700	(wate)	3193	2650	83.02	280	8.78	2.96
80	M.G.W.	7100	(rail)	8342	2643	31.68	3959	47.45	3.70
81	Alliance Assurance	8200	(insu)	2625	2625	100.00	0	0.00	3.81
82	London Chatham and Dover	7100	(rail)	24912	2590	10.40	12233	49.11	0.00
83	London & Provincial	8140	(bank)	2580	2580	100.00	0	0.00	4.07
84	Linotype	9999	(misc)	2572	2572	100.00	0	0.00	0.70
85	Standard Bank of South Africa	8140	(bank)	2560	2560	100.00	0	0.00	6.25
86	Kent Waterworks	1700	(wate)	37032	2552	6.89	34480	93.11	4.04
87	London and S. African Exploration L	8150	(inve)	2500	2500	100.00	0	0.00	3.20
88	Randfontein Estates and Gold L	2100	(mine)	2500	2500	100.00	0	0.00	0.00
89	Colonial	8140	(bank)	2460	2460	100.00	0	0.00	1.46
90	Vickers, Sons & Maxim Limited	2210	(iron)	5535	2438	44.04	1325	23.94	4.62
91	Northern Assurance, Fire & Life	8200	(insu)	2430	2430	100.00	0	0.00	3.70
92	Clydesdale Limited	8140	(bank)	2425	2425	100.00	0	0.00	4.12
93	Royal Exchange Fire Life and Mar	8200	(insu)	2412	2412	100.00	0	0.00	4.00
94	Geldenhuis Deep	2100	(mine)	2325	2325	100.00	0	0.00	3.87
95	Commercial Gas	1620	(misc)	2620	2325	88.72	295	11.28	4.08
96	Bolckow, Vaughan & Co. Lim	2210	(iron)	2900	2304	79.45	0	0.00	5.96
97	Ulster Bank Limited	8140	(bank)	2273	2273	100.00	0	0.00	3.96
98	London & Globe Finance Corp	8150	(inve)	2250	2250	100.00	0	0.00	0.00
99	Phoenix Fire	8200	(insu)	2232	2232	100.00	0	0.00	4.22
100	Ferreira	2100	(mine)	2228	2228	100.00	0	0.00	6.06
101	Distillers Limited	4240	(misc)	2219	2219	100.00	0	0.00	5.00
102	North and South Wales	8140	(bank)	2190	2190	100.00	0	0.00	4.11
103	Commercial Union Fire Life Marine	8200	(insu)	2507	2175	86.77	332	13.23	3.45
104	New River	1700	(wate)	4325	2173	50.23	2153	49.77	1.52
105	Brazilian Submarine Tel. L	7902	(tele)	2133	2133	100.00	0	0.00	4.27
106	Champion Reef Gold Limited	2100	(mine)	2118	2118	100.00	0	0.00	10.91

Table 3: Top British companies in 1898 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
107	Broken Hill Proprietary, Lim	2100	(mine)	2100	2100	100.00	0	0.00	11.43
108	London Ass. Corp. F.L. & Marine	8200	(insu)	2080	2080	100.00	0	0.00	4.31
109	London and South Western	8140	(bank)	2070	2070	100.00	0	0.00	3.77
110	Nettlefolds Lim	9999	(misc)	2378	2058	86.53	0	0.00	3.06
111	Liebig's Extract of Meat L	9999	(misc)	2050	2050	100.00	0	0.00	4.88
112	York City and County Banking	8140	(bank)	2027	2027	100.00	0	0.00	4.04
113	Bank of Australasia	8140	(bank)	2000	2000	100.00	0	0.00	4.00
114	City Limited	8140	(bank)	2000	2000	100.00	0	0.00	4.75
115	Aerated Bread Limited	9999	(misc)	1986	1986	100.00	0	0.00	2.94
116	City and Suburban	2100	(mine)	1976	1976	100.00	0	0.00	5.33
117	Sheffield United Gas Light	1620	(misc)	1965	1965	100.00	0	0.00	4.03
118	Highland	7100	(rail)	7097	1910	26.82	2662	37.51	1.51
119	Howard & Bullough Limited	9999	(misc)	2570	1900	73.93	270	10.51	3.16
120	Associated Gold of W. Aust	2100	(mine)	1875	1875	100.00	0	0.00	5.33
121	Lancaster Banking	8140	(bank)	1870	1870	100.00	0	0.00	3.82
122	Nourse Deep	2100	(mine)	1828	1828	100.00	0	0.00	0.00
123	Mount Lyall Mining & Rly	2100	(mine)	1824	1824	100.00	0	0.00	7.27
124	Liverpool Union Bank	8140	(bank)	1823	1823	100.00	0	0.00	4.12
125	National Discount Co	8140	(bank)	1820	1820	100.00	0	0.00	5.12

Table 4: Top British companies in 1913 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
1	London and N. Western	7100	(rails)	133786	59939	44.80	45742	34.19	4.65
2	Midland	7100	(rails)	129254	52004	40.23	37583	29.08	4.78
3	Coats, J and P	9999	(misc)	55525	51900	93.47	0	0.00	6.07
4	Great Western	7100	(rails)	116610	42144	36.14	59664	51.17	4.82
5	North-Eastern	7100	(rails)	81655	38744	47.45	26802	32.82	4.96
6	Bank of England	8140	(banks)	33690	33690	100.00	0	0.00	3.89
7	British-American Tobacco Co	9999	(misc)	30314	28135	92.81	0	0.00	5.89
8	Rio Tinto	2100	(mines)	28847	27141	94.09	0	0.00	6.22
9	De Beers	2100	(mines)	36721	35100	58.55	1621	4.41	10.11
10	Guinness (Arthur), Son & Co	4270	(brewr)	21100	18250	86.49	0	0.00	4.52
11	Lancashire & Yorkshire	7100	(rails)	56844	16845	29.63	18188	32.00	4.61
12	London and S. Western	7100	(rails)	46036	16771	36.43	12435	27.01	4.76
13	Gas Light and Coke	1021	(gas)	25787	16498	63.98	5430	21.06	4.84
14	'Shell "Transport and Trading	1300	(oil)	17070	15514	90.88	0	0.00	5.82
15	Great Northern	7100	(rails)	49431	15205	30.76	16912	34.21	4.33
16	Lloyds Bank Limited	8140	(banks)	14862	14862	100.00	0	0.00	5.24
17	London City & Midland Limited	8140	(banks)	14720	14720	100.00	0	0.00	4.88
18	London County & Westminster	8140	(banks)	14700	14700	100.00	0	0.00	5.06
19	Caledonian	7100	(rails)	50277	14293	28.43	21094	41.96	4.36
20	Rand Mines	2100	(mines)	13553	13553	100.00	0	0.00	8.63
21	Crown Mines	2100	(mines)	12809	12809	100.00	0	0.00	8.07
22	Imp. Tob. Co (Gt. Bn & I)	9999	(Misc)	17876	11522	64.46	0	0.00	2.29
23	London, Brighton & S. Coast	7100	(rails)	32413	10733	33.11	10227	31.55	5.01
24	Brunner, Mond and Co	9999	(misc)	12974	10724	82.66	0	0.00	5.87
25	National Provincial Bank of England	8140	(banks)	10578	10578	100.00	0	0.00	5.11
26	Hongkong and Shanghai Banking	8140	(banks)	9720	9720	100.00	0	0.00	5.25
27	North British	7100	(rails)	47995	9518	19.83	17971	37.44	4.28
28	Gt. S. & Western of Ireland	7100	(rails)	13487	9354	69.35	2748	20.38	2.85
29	Great Eastern	7100	(rails)	46956	9026	19.22	24160	51.45	4.26
30	Parr's Bank, Limited	8140	(banks)	8819	8819	100.00	0	0.00	5.12
31	Alliance Assurance Co Limited	8200	(insur)	8725	8725	100.00	0	0.00	4.81
32	South-Eastern	7100	(rails)	31119	8721	28.02	11538	37.08	4.53
33	Barclay and Co	8140	(banks)	8494	8494	100.00	0	0.00	5.47
34	Royal Insurance Co	8200	(insur)	9080	8245	90.80	835	9.20	4.73

Table 4: Top British companies in 1913 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
35	Imperial Continental Gas	1021	(gas)	9139	8077	88.38	1062	11.62	5.50
36	Union of London and Smiths Bank	8140	(banks)	7454	7454	100.00	0	0.00	5.72
37	South Metropolitan Gas	1021	(gas)	8411	7009	83.32	1403	16.68	5.02
38	Commercial Union Assurance Co	8200	(insur)	8841	6933	78.41	1908	21.59	3.83
39	Manchester and Liverpool District	8140	(banks)	6853	6853	100.00	0	0.00	4.84
40	Burmah Oil	1300	(oil)	7996	6548	81.89	245	3.06	5.82
41	Armstrong (Sir W.G) Whitwh	2210	(iron)	9795	6520	66.57	2400	24.50	6.15
42	Vickers, Limited	2210	(iron)	10573	6475	61.24	2575	24.36	5.71
43	London & River Plate, Limited	8140	(banks)	6360	6360	100.00	0	0.00	6.60
44	East Rand Proprietary	2100	(mines)	6268	6268	100.00	0	0.00	9.76
45	Bank of Ireland	8140	(banks)	6231	6231	100.00	0	0.00	4.44
46	Glasgow & S-W	7100	(rails)	18069	6030	33.37	6924	38.32	4.94
47	New Jagersfontein	2100	(mines)	5684	5684	100.00	0	0.00	6.73
48	Liverpool & London & Globe	8200	(insur)	6748	5527	81.91	1221	18.09	4.89
49	Randfontein Central	2100	(mines)	5500	5500	100.00	0	0.00	9.09
50	British Linen Bank	8140	(banks)	5381	5381	100.00	0	0.00	4.41
51	London Joint Stock, Limited	8140	(banks)	5297	5297	100.00	0	0.00	5.98
52	Capital and Counties, Limited	8140	(banks)	5250	5250	100.00	0	0.00	5.33
53	Eastern Telegraph, Limited	7902	(teleg)	8415	5180	61.55	1735	20.62	5.41
54	Babcock and Wilcox, Limited	2210	(iron)	5111	4980	97.43	0	0.00	5.33
55	Royal Bank of Scotland	8140	(bank)	4840	4840	100.00	0	0.00	4.55
56	Consolidated Gold Fields of S.A	2100	(mines)	7359	4813	65.39	203	2.76	6.23
57	Metropolitan	7100	(rails)	13827	4691	33.92	4146	29.99	0.00
58	Great Northern Telegraph	7902	(teleg)	4650	4650	100.00	0	0.00	6.45
59	Anglo-American Telegraph	7902	(teleg)	4612	4612	100.00	0	0.00	5.69
60	Bank of Australiasia	8140	(banks)	4560	4560	100.00	0	0.00	5.96
61	Maypole Dairy	9999	(misc)	4916	4522	91.99	0	0.00	10.74
62	Met. Carr. Wagon and Finance	9999	(misc)	4995	4408	88.24	0	0.00	4.85
63	Tharsis Sulphur and Copper	2100	(mines)	4375	4375	100.00	0	0.00	5.71
64	Modderfontein (New)	2100	(mines)	4331	4331	100.00	0	0.00	9.70
65	North British and Mercantile	8200	(insur)	5915	4235	71.60	0	0.00	5.19
66	Randfontein Estates Gold	2100	(mines)	4219	4219	100.00	0	0.00	8.89
67	London & Brazilian Limited	8140	(banks)	4125	4125	100.00	0	0.00	6.06
68	Great Northern of Ireland	7100	(rails)	8777	4087	46.57	3200	36.46	5.07
69	Premier (Transvaal) Diamond	2100	(mines)	5440	4040	74.26	0	0.00	9.90
70	Bank of Liverpool, Limited	8140	(banks)	4008	4008	100.00	0	0.00	5.29

Table 4: Top British companies in 1913 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
71	Consett Iron, Limited	2211	(iron)	4819	3963	82.23	0	0.00	9.15
72	Central Mining and Investment	2100	(mines)	3931	3931	100.00	0	0.00	6.49
73	Commercial of Scotland, Limited	8140	(banks)	3825	3825	100.00	0	0.00	5.23
74	London & Provincial, Limited	8140	(banks)	3825	3825	100.00	0	0.00	4.97
75	Eastern Ext., Austr. and China	7902	(teleg)	4517	3825	84.68	692	15.32	5.49
76	Nobel Dynamite Trust, Limited	9999	(misc)	4899	3799	77.55	0	0.00	6.02
77	Taff Vale	7100	(rails)	7914	3791	47.89	1114	14.08	5.14
78	Bank of Scotland	8140	(banks)	3684	3684	100.00	0	0.00	4.75
79	Standard Bank of South Africa	8140	(banks)	3639	3639	100.00	0	0.00	5.74
80	Chartered Bank of I., A., & Ch.	8140	(banks)	3540	3540	100.00	0	0.00	5.59
81	City Deep	2100	(mines)	3516	3516	100.00	0	0.00	8.00
82	Williams, Deacon's, Limited	8140	(banks)	3506	3506	100.00	0	0.00	5.35
83	London & South-Western, Limited	8140	(banks)	3500	3500	100.00	0	0.00	4.86
84	P. & O. Steam Nav	7400	(ships)	7595	3480	45.82	1529	20.13	5.00
85	Barry	7100	(rails)	6083	3427	56.33	891	14.64	4.02
86	Fine Cotton Spinners	9999	(misc)	9433	3375	35.78	2683	28.44	5.33
87	Union Bank of Australia, Limited	8140	(banks)	3954	3360	84.98	594	15.02	6.25
88	Sun Insurance Office	8200	(insur)	3360	3360	100.00	0	0.00	5.00
89	Fife Coal, Limited	1113	(coal)	3799	3316	87.28	0	0.00	6.77
90	Mount Morgan	2100	(mines)	3313	3313	100.00	0	0.00	6.04
91	Phoenix Assurance, Limited	8200	(insur)	4484	3249	72.48	1234	27.52	3.57
92	London and Lancashire Fire	8200	(insur)	3222	3222	100.00	0	0.00	4.10
93	Lena Goldfields	2100	(mines)	3175	3175	100.00	0	0.00	7.27
94	Mysore Gold Mining	2100	(mines)	3164	3164	100.00	0	0.00	12.05
95	Kyshim Corporation	2100	(mines)	3063	3063	100.00	0	0.00	1.63
96	Manchester & County	8140	(banks)	3054	3054	100.00	0	0.00	2.53
97	Kellner-Partington, Limited	9999	(misc)	4012	3044	75.86	640	15.96	5.98
98	Lancashire and Yorkshire Limited	8140	(banks)	3041	3041	100.00	0	0.00	4.82
99	Clydesdale, Limited	8140	(banks)	3025	3025	100.00	0	0.00	4.96
100	Union Bank of Scotland	8140	(banks)	3025	3025	100.00	0	0.00	4.96
101	N. Staffordshire	7100	(rails)	8962	3020	33.69	3554	39.66	5.21
102	Guest, Keen and Nettlefolds	2210	(iron)	6724	3016	44.85	1795	26.69	4.80
103	National, Limited	8140	(banks)	3000	3000	100.00	0	0.00	5.00
104	Rylands and Sons, Limited	9999	(misc)	2977	2977	100.00	0	0.00	5.55
105	Ferreira Deep	2100	(mines)	2940	2940	100.00	0	0.00	15.83
106	Furness, Withy, and Co	7400	(ships)	4300	2875	66.86	0	0.00	6.96

Table 4: Top British companies in 1913 by ordinary share market capitalization:

Rank	Name	Industry		(1) total cap (£'000)	(2) total ord (£'000)	(2)/(1) %	(3) total deb (£'000)	(3)/(1) %	Dividend rate of return at market
107	Arizona Copper	2100	(mines)	2850	2850	100.00	0	0.00	8.67
108	Marconi's Wireless Telegraph	7902	(teleg)	3594	2813	78.26	0	0.00	5.33
109	Pacific Phosphate Co	9999	(misc)	2969	2813	94.74	0	0.00	5.00
110	Anglo-South American Bank	8140	(banks)	2805	2805	100.00	0	0.00	7.06
111	British Bank of S. America	8140	(banks)	2750	2750	100.00	0	0.00	7.27
112	Bolckow, Vaughan, and Co	2210	(iron)	3242	2735	84.35	0	0.00	5.02
113	Great Central	7100	(rails)	43831	2709	6.18	24835	56.66	0.00
114	Western Telegraoh	7902	(teleg)	3452	2703	78.30	749	21.70	5.38
115	Modderfontein "B"	2100	(mines)	2669	2669	100.00	0	0.00	10.49
116	North London	7100	(rails)	4012	2631	65.58	1108	27.63	3.67
117	Lyons (J.), & Co	9999	(misc)	3530	2599	73.60	401	11.35	5.82
118	Powell-Duffryn Steam Coal Co	1113	(coal)	2771	2578	93.04	0	0.00	4.80
119	London and Blackwall	7100	(rails)	3678	2554	69.43	847	23.02	4.09
120	Wilts and Dorset Banking Limited	8140	(banks)	2538	2538	100.00	0	0.00	5.52
121	United Counties Bank, Limited	8140	(banks)	2527	2527	100.00	0	0.00	6.20
122	Brakpan	2100	(mines)	2484	2484	100.00	0	0.00	13.58
123	Northern Assurance, Limited	8200	(insur)	2475	2475	100.00	0	0.00	4.85
124	Liebig's Extract of Meat	9999	(meat)	3425	2400	70.07	0	0.00	5.62
125	Underground Electric Railways	9999	(misc)	10993	2388	21.72	8605	78.28	0.00

Table 5: Top British companies in benchmark years, aggregated by financial instrument (all companies and selected sectors):

No. of Firms	Year	Instrument	All Companies (£'000)	Railways (£'000)	Mines
888	1868	All types	832200.00 (1)		
888	1868	Ordinary	522310.00 (2)		
125	1868	All types	453410.71	291366.12	0.00
125	1868	Ordinary	308836.49 (3)	147983.77	0.00
125	1868	Preference	33700.03	33538.78	0.00
125	1868	Debenture	110874.19	109843.57	0.00
125	1868	Dividends	15145.07 (4)	6991.37	0.00
888	1868	(2)/(1) %	62.76%		
888	1868	(3)/(2) %	59.13%		
125	1868	(4)/(3) %	4.90%	4.72%	0.00%
984	1873	All types	1340800.00 (1)		
984	1873	Ordinary	771900.00 (2)		
125	1873	All types	670504.62	455214.99	3606.78
125	1873	Ordinary	440732.77 (3)	228675.07	3606.78
125	1873	Preference	53103.51	51045.26	0.00
125	1873	Debenture	176668.34	175494.66	0.00
125	1873	Dividends	22000.01 (4)	11425.82	125.66
984	1873	(2)/(1) %	57.57%		
984	1873	(3)/(2) %	57.10%		
125	1873	(4)/(3) %	4.99%	5.00%	3.48%
1051	1878	All types	n/a		
1051	1878	Ordinary	n/a		
125	1878	All types	874639.94	600221.21	5142.61
125	1878	Ordinary	551918.15 (3)	291126.12	3110.81
125	1878	Preference	112466.74	104783.89	0.00
125	1878	Debenture	210255.04	204311.20	2031.80
125	1878	Dividends	22463.97 (4)	10549.74	303.75
1051	1878	(2)/(1) %	n/a		
1051	1878	(3)/(2) %	n/a		
125	1878	(4)/(3) %	4.07%	3.62%	9.76%
1212	1883	All types	2191800.00 (1)		
1197	1883	Ordinary	1348500.00 (2)		
125	1883	All types	1120010.23	807712.28	13378.70
125	1883	Ordinary	590272.43 (3)	312741.60	10951.98
125	1883	Preference	194549.01	186699.02	0.00
125	1883	Debenture	335188.79	308271.65	2426.73
125	1883	Dividends	26505.44 (4)	12890.95	778.03
1212	1883	(2)/(1) %	61.52%		
1197	1883	(3)/(2) %	43.77%		
125	1883	(4)/(3) %	4.49%	4.12%	7.10%

Table 5: continued:

No. of Firms	Year	Instrument	All Companies (£'000)	Railways (£'000)	Mines (£'000)
1317	1888	All types	2623400.00 (1)		
1317	1888	Ordinary	1101400.00 (2)		
125	1888	All types	1260541.89	912635.68	23758.65
125	1888	Ordinary	635403.49 (3)	322565.00	20174.27
125	1888	Preference	229791.26	215597.27	0.00
125	1888	Debenture	395347.15	374473.40	3584.38
125	1888	Dividends	26108.38 (4)	11565.94	1311.73
1317	1888	(2)/(1) %	41.98%		
1317	1888	(3)/(2) %	57.69%		
125	1888	(4)/(3) %	4.11%	3.59%	6.50%
1273	1893	All types	7169300.00 (1)[1]		
1261	1893	Ordinary	3692700.00 (2)[1]		
125	1893	All types	1811258.53	1236395.43	36838.30
125	1893	Ordinary	717061.11 (3)	366689.18	30992.42
125	1893	Preference	287515.54	262818.91	0.00
125	1893	Debenture	806681.88	606887.34	5845.88
125	1893	Dividends	26892.15 (4)	10951.04	1882.75
1273	1893	(2)/(1) %	51.51%		
1261	1893	(3)/(2) %	19.42%		
125	1893	(4)/(3) %	3.75%	2.99%	6.07%
1419	1898	All types	2982200.00 (1)		
1415	1898	Ordinary	1406500.00 (2)		
125	1898	All types	1841006.44	1293738.43	101746.21
125	1898	Ordinary	935807.37 (3)	450252.59	90172.52
125	1898	Preference	318851.01	291407.51	3298.44
125	1898	Debenture	586348.06	552078.34	8275.25
125	1898	Dividends	33723.00 (4)	13955.54	4808.24
1419	1898	(2)/(1) %	47.16%		
1415	1898	(3)/(2) %	66.53%		
125	1898	(4)/(3) %	3.60%	3.02%	5.33%
1518	1903	All types	3086600.00 (1)		
1518	1903	Ordinary	1537300.00 (2)		
125	1903	All types	1876051.10	1183415.28	186716.97
125	1903	Ordinary	965573.55 (3)	389057.33	160887.43
125	1903	Preference	326710.93	260970.57	19463.57
125	1903	Debenture	583766.62	533387.38	6365.98
125	1903	Dividends	39846.10 (4)	13587.00	7670.14
1518	1903	(2)/(1) %	49.80%		
1518	1903	(3)/(2) %	62.81%		
125	1903	(4)/(3) %	4.13%	3.49%	4.77%

[1] *Foreign firms whose security prices were quoted in sterling were not distinguished from domestic ones prior to, or in, the 1893 benchmark year. However, the expansion of the IMM's coverage of sterling-priced foreign firms accelerated considerably between 1888 and 1893, resulting in a near tripling of the sterling market capitalisation of quoted companies, even as the number of companies listed fell. By 1898 the IMM's coverage had further expanded but was organised so that the IMM had segmented the foreign, sterling-priced, firms into separate sections which we automatically exclude from the valuations considered here (e.g. most notably Foreign Railway). Hence, because of these differences in coverage, the capitalised amounts of the total market experience a break in coverage between 1893 and 1898. By 1898, only "domestic" sterling-priced companies are included.*

Table 5: continued:

No. of Firms	Year	Instrument	All Companies (£'000)	Railways (£'000)	Mines (£'000)
1508	1908	All types	2810800.00 (1)		
1508	1908	Ordinary	1501300.00 (2)		
125	1908	All types	1680958.37	957641.46	140862.52
125	1908	Ordinary	934748.31 (3)	330974.48	121292.58
125	1908	Preference	333859.32	258857.93	15955.94
125	1908	Debenture	412350.74	367809.05	3614.00
125	1908	Dividends	43661.08 (4)	13758.87	7227.61
1508	1908	(2)/(1) %	53.41%		
1508	1908	(3)/(2) %	62.26%		
125	1908	(4)/(3) %	4.67%	4.16%	5.96%
1552	1913	All types	3200900.00 (1)		
1552	1913	Ordinary	1690600.00 (2)		
125	1913	All types	1752954.93	957969.93	166210.15
125	1913	Ordinary	1044695.68 (3)	331734.95	145336.22
125	1913	Preference	312390.03	262816.65	19050.00
125	1913	Debenture	395868.22	363418.32	1823.93
125	1913	Dividends	57714.02 (4)	15334.31	12608.26
1552	1913	(2)/(1) %	52.82%		
1552	1913	(3)/(2) %	61.77%		
125	1913	(4)/(3) %	5.52%	4.62%	8.68%

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1902	British American Tobacco Co (misc: tobacco)	-	8	0.00	28135.00	0.00	6252.17	0.00	6252.17
1897	'Shell "Transport and Trading Co (oil)	-	14	0.00	15514.00	0.00	3008.77	0.00	3008.77
1909	London County and Westminster Bank (bank)	-	18	0.00	14700.00	0.00	3500.00	0.00	14000.00
1892	Crown Mines (mine)	-	21	0.00	12809.00	0.00	940.11	0.00	940.11
1901	Imperial Tobacco (Gt. Bn & I) (Misc. tobac)	-	23	0.00	11522.00	0.00	7898.69	0.00	7898.69
1896	Barclay and Co. (bank)	-	32	0.00	8494.00	0.00	3600.00	0.00	9000.00
1839	Union of London & Smiths Bank (bank)	-	35	0.00	7454.00	0.00	3554.79	0.00	22934.10
1898	Maypole Dairy Co. (retail: misc)	-	36	0.00	7412.00	0.00	635.00	0.00	635.00
1886	Burmah Oil Co. (oil)	-	40	0.00	6548.00	0.00	1905.00	0.00	1905.00
1887	New Jagersfontein Mine (mine)	-	48	0.00	5684.00	0.00	850.00	0.00	850.00
1836	L þool & London & Globe Insurance Co (insur)	-	49	0.00	5527.00	0.00	245.64	0.00	2456.40
1907	Randfontein Central Mine (mine)	-	51	0.00	5500.00	0.00	4000.00	0.00	4000.00
1891	Babcock and Wilcox (iron)	-	57	0.00	4980.00	0.00	1660.00	0.00	1660.00
1866	Anglo-American Telegraph Co. (teleg)	-	62	0.00	4612.00	0.00	7000.00	0.00	7000.00
1902	Met. Carriage, Wagon & Finance (misc: engin)	-	64	0.00	4408.00	0.00	1424.71	0.00	1424.71
1895	Modderfontein (New) Mine (mine)	-	66	0.00	4331.00	0.00	1400.00	0.00	1400.00
1862	London & Brazilian Bank (bank)	-	69	0.00	4125.00	0.00	1250.00	0.00	2500.00
1902	Premier (Transvaal) Diamond Mine (mine)	-	71	0.00	4040.00	0.00	40.00	0.00	40.00
1905	Central Mining and Investment Co. (mine)	-	74	0.00	3931.00	0.00	5100.00	0.00	5100.00
1853	Chartered Bank of India, Austral & China (bank)	-	82	0.00	3540.00	0.00	1200.00	0.00	1200.00
1899	City Deep Mine (mine)	-	83	0.00	3516.00	0.00	1250.00	0.00	1250.00
1898	Fine Cotton Spinners and Doublers (misc cotton)	-	87	0.00	3375.00	0.00	2250.00	0.00	2250.00
1837	Union Bank of Australia (bank)	-	88	0.00	3360.00	0.00	1500.00	0.00	4500.00
1872	Fife Coal Co. (coal)	-	90	0.00	3316.00	0.00	816.26	0.00	816.26
1862	London and Lancashire Fire Insurance (insur)	-	93	0.00	3222.00	0.00	264.12	0.00	2641.25
1908	Lena Goldfields (mine)	-	94	0.00	3175.00	0.00	1154.47	0.00	1154.47
1908	Kyshim Corporation (Russian mine)	-	96	0.00	3063.00	0.00	1000.00	0.00	1000.00
1889	Kellner-Partington Co. (misc. Chemicals)	-	98	0.00	3044.00	0.00	910.30	0.00	910.30
1872	Lancashire and Yorkshire Bank (bank)	-	99	0.00	3041.00	0.00	862.66	0.00	1725.32
1900	Guest, Keen and Nettlefolds (iron)	-	103	0.00	3016.00	0.00	965.00	0.00	965.00
1898	Ferreira Deep Mine (mine)	-	106	0.00	2940.00	0.00	980.00	0.00	980.00
1891	Furness, Withy and Co (ships)	-	107	0.00	2875.00	0.00	2000.00	0.00	2000.00

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1884	Arizona Copper Mine (mine)	-	108	0.00	2850.00	0.00	379.97	0.00	379.97
1897	Marconi's Wireless Telegraph (teleg)	-	109	0.00	2813.00	0.00	750.00	0.00	750.00
1902	Pacific Phosphate Co. (misc)	-	110	0.00	2813.00	0.00	562.50	0.00	750.00
1888	Anglo-South American Bank (bank)	-	111	0.00	2805.00	0.00	1650.00	0.00	3300.00
1862	British Bank of South Africa (bank)	-	112	0.00	2750.00	0.00	1000.00	0.00	2000.00
1908	Modderfontein "B" Mine (mine)	-	116	0.00	2669.00	0.00	700.00	0.00	700.00
1894	Lyons (J) & Co (misc: retail)	-	118	0.00	2599.00	0.00	756.00	0.00	756.00
1864	Powell-Duffryn Steam Coal Co (coal)	-	119	0.00	2578.00	0.00	825.00	0.00	825.00
1836	London and Blackwall Rly (rail)	-	120	0.00	2554.00	0.00	2321.49	0.00	2321.49
1836	United Counties Bank (bank)	-	122	0.00	2527.00	0.00	1193.33	0.00	5966.66
1903	Brakpan Mine (mine)	-	123	0.00	2484.00	0.00	750.00	0.00	750.00
1846	London and N. Western Rly (rail)	1	1	81525.00	-32.21	40813.67	5.09	40813.67	5.09
1844	Midland Rly (rail)	2	2	61366.00	-15.26	69832.77	11.81	69832.77	11.81
1694	Bank of England (bank)	3	7	50863.00	-33.76	14553.00	0.00	14553.00	0.00
1854	North-Eastern Rly (rail)	4	5	49541.00	-21.79	27637.82	15.86	27637.82	15.86
1833	Great Western Rly (rail)	5	4	40559.00	3.91	24396.20	47.96	24396.20	47.96
1834	London and S. Western Rly (rail)	6	13	26811.00	-37.45	14268.35	53.01	14268.35	53.01
1845	Caledonian Rly (rail)	7	19	24803.00	-42.37	27936.41	25.86	27936.41	25.86
1836	Lancashire and Yorkshire Rly (rail)	8	12	24614.00	-31.56	16841.00	11.76	16841.00	11.76
1861	De Beers Mines (mine)	9	6	21323.00	64.61	4235.44	6.25	4235.44	6.25
1846	Great Northern Rly (rail)	10	15	19901.00	-23.60	20499.19	0.60	20499.19	0.60
1884	Coats, J & P (misc)	11	3	18000.00	188.33	3000.00	150.00	3000.00	150.00
1812	Gas Light and Coke (gas)	12	10	17443.00	-5.42	6022.11	172.59	6022.11	172.59
1836	South-Eastern Rly (rail)	13	31	15375.00	-43.28	10043.03	0.06	10043.03	0.06
1862	Great Eastern Rly (rail)	14	28	15182.00	-40.55	12572.89	22.19	12572.89	22.19
1844	London, Brighton & S. Coast Rly (rail)	15	24	15110.00	-28.97	8431.00	25.62	8431.00	25.62
1886	Guinness (Arthur), Son & Co (brewr)	16	11	14750.00	23.73	2500.00	100.00	2500.00	100.00
1833	National Provincial Bank of England (bank)	17	25	14383.00	-26.45	3000.00	0.00	15900.00	0.00
1783	Bank of Ireland (bank)	18	45	11550.00	-46.05	3000.00	-7.69	3000.00	-7.69
1896	Armstrong (Sir W.G) Whitworth & Co (iron)	19	41	10232.00	-36.28	3210.00	0.00	3210.00	0.00
1844	North British Rly (rail)	20	27	10202.00	-6.70	15905.22	35.67	15905.22	35.67
1836	London & County Banking Co (bank)	21	-	10100.00	-100.00[1]	2000.00	-100.00	8000.00	-100.00
1893	Rand Mines (mine)	22	20	9815.00	38.08	332.71	59.75	332.71	59.75
1853	Metropolitan Rly (rail)	23	60	9296.00	-49.54	7922.75	14.89	7922.75	14.89

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1873	Rio Tinto Mines (mine)	24	9	8450.00	221.20	1625.00	15.38	1625.00	15.38
1834	London & Westminster Bank (bank)	25	-	8050.00	-100.00[2]	2800.00	-100.00	14000.00	-100.00
1865	Lloyds Bank Ltd (bank)	26	16	8033.00	85.01	2040.00	106.31	12750.00	106.31
1824	Imperial Continental Gas (gas)	27	34	7961.00	1.46	3800.00	30.00	3800.00	30.00
1842	South Metropolitan Gas Co (gas)	28	37	7771.00	-9.81	5531.25	16.25	5531.25	16.25
1837	Glasgow & South Western Rly (rail)	29	47	7302.00	-17.42	10331.09	22.49	10331.09	22.49
1844	Gt. Southern & Western of Ireland Rly (rail)	30	53	7233.00	29.32	4971.15	87.09	4971.15	87.09
1872	Eastern Telegraph Ltd (teleg)	31	56	7000.00	-26.00	4000.00	0.00	4000.00	0.00
1845	Royal Insurance Co Ltd (insur)	32	33	6825.00	20.81	1001.87	-55.91	2504.68	17.57
1876	Great Northern of Ireland Rly (rail)	33	70	6304.00	-35.17	3541.80	14.26	3541.80	14.26
1836	London City and Midland Bank (bank)	34	17	6223.00	136.54	1467.69	171.80	7044.90	171.80
1746	British Linen Company (bank)	35	52	6125.00	-12.15	1250.00	0.00	1250.00	0.00
1865	Parr's Bank Ltd (bank)	36	29	5907.00	49.30	1320.00	67.03	6600.00	67.03
1892	Consolidated Gold Fields of S. Africa (mine)	37	59	5653.00	-14.86	1350.00	48.15	1350.00	48.15
1829	Manchester & L'pool District Bank (bank)	38	39	5250.00	30.53	1000.00	89.60	6000.00	58.00
1898	Goldfields Deep Mine (mine)	39	-	5063.00	-100.00[3]	600.00	-100.00	600.00	-100.00
1849	Great Central Rly (rail)	40	114	4779.00	-43.31	9552.81	11.57	9552.81	11.57
1886	Mount Morgan Mine (mine)	41	91	4688.00	-29.33	875.00	14.29	1000.00	0.00
1727	Royal Bank of Scotland (bank)	42	58	4630.00	4.54	2000.00	0.00	2000.00	0.00
1809	North British and Mercantile Insurance (insur)	43	67	4620.00	-8.33	687.50	0.00	2750.00	0.00
1846	North London Rly (rail)	44	117	4536.00	-42.00	2020.40	35.34	2020.40	35.34
1869	Great Northern & Telegraph Co (teleg)	45	61	4500.00	3.33	1500.00	0.00	1500.00	0.00
1840	P&O Steam Navigation (shipping)	46	46	4466.00	35.83	2320.00	50.86	2320.00	50.86
1873	Eastern Ext., Austral and China (teleg)	47	77	4438.00	-13.81	2500.00	20.00	2500.00	20.00
1695	Bank of Scotland (bank)	48	79	4413.00	-16.52	1250.00	-29.33	1250.00	6.00
1887	Robinson Mines (mine)	49	-	4400.00	-100.00[4]	2750.00	-100.00	2750.00	-100.00
1810	Commercial Bank of Scotland Ltd (bank)	50	75	4300.00	-11.05	1000.00	0.00	5000.00	0.00
1825	National Bank of Scotland (bank)	51	80	4150.00	-10.36	1000.00	0.00	1000.00	0.00
1847	North Staffordshire Rly (rail)	52	102	4102.00	-26.38	3230.14	11.28	3230.14	11.28
1836	London Joint Stock Bank Ltd (bank)	53	54	4080.00	29.83	1800.00	65.00	12000.00	65.00
1785	Lambeth Waterworks (water)	54	-	4073.00	-100.00[5]	725.00	-100.00	1450.00	-100.00
1836	Taff Vale Rly (rail)	55	79	4063.00	-6.69	5192.28	0.00	5192.28	0.00
1873	Rylands and Sons (misc)	56	105	4043.00	-26.37	1804.28	0.00	2000.00	0.00
1807	East London Waterworks (water)	57	-	3914.00	-100.00[6]	1720.56	-100.00	1720.56	-100.00

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1866	Tharsis Sulphur and Copper Mines (mine)	58	65	3906.00	12.01	1250.00	0.00	1250.00	0.00
1839	Union Bank of London (bank)	59	-	3850.00	-100.00[7]	1705.00	-100.00	11000.00	-100.00
1887	Simmer and Jack Proprietary Mine (mine)	60	-	3813.00	-100.00[8]	5000.00	-100.00	5000.00	-100.00
1834	Capital and Counties Bank Ltd (bank)	61	54	3777.00	39.00	932.50	87.67	4662.50	87.67
1881	Brunner, Mond and Co (misc)	62	22	3942.00	323.88	950.84	153.44	1381.69	109.70
1867	Hongkong and Shanghai Banking Co (bank)	63	26	3680.00	164.13	2250.00	33.33	2250.00	33.33
1893	East Rand Proprietary Mine (mine)	64	44	3516.00	78.27	750.00	226.12	750.00	226.12
1806	West Middlesex Water (water)	65	-	3436.00	-100.00[9]	1155.07	-100.00	1155.07	-100.00
1862	Manchester and County Bank (bank)	66	97	3324.00	-8.12	873.63	25.00	5460.20	0.00
1836	Williams, Deacon's Bank Ltd (bank)	67	83	3242.00	8.14	1000.00	25.00	6250.00	25.00
1831	Bank of Liverpool Ltd (bank)	68	72	3210.00	24.86	1000.00	41.25	8000.00	41.25
1838	London & St. Katherine's Docks (dock)	69	-	3109.00	-100.00[10]	5756.70	-100.00	5756.70	-100.00
1835	National Bank Ltd (bank)	70	104	3075.00	-2.44	1500.00	0.00	7500.00	0.00
1862	London and River Plate Bank Ltd (bank)	71	43	3060.00	107.84	900.00	100.00	1500.00	100.00
1835	Wilts and Dorset Banking Co Ltd (bank)	72	121	3000.00	-15.40	600.00	16.67	3000.00	16.67
1886	Nobel Dynamite Trust Limited (misc)	73	78	2982.00	27.40	1753.97	30.30	1753.97	30.30
1864	Consett Iron Ltd (iron)	74	73	2900.00	36.66	750.00	0.00	1000.00	0.00
1809	Kent Waterworks (water)	75	-	2897.00	-100.00[11]	868.00	-100.00	868.00	-100.00
1835	European Gas Limited (misc)	76	-	2836.00	-100.00[12]	1201.64	-100.00	1440.15	-100.00
1793	Grand Junction Waterworks (water)	77	-	2811.00	-100.00[13]	1240.00	-100.00	1240.00	-100.00
1880	Mysore Gold Mining Co (mine)	78	95	2750.00	15.05	250.00	22.00	250.00	22.00
1884	Barry Rly (rail)	79	86	2735.00	25.30	1599.87	95.58	1599.87	95.58
1710	Sun Insurance Office (insur)	80	89	2700.00	24.44	120.00	100.00	2400.00	0.00
1830	Union Bank of Scotland (bank)	81	101	2675.00	13.08	1000.00	0.00	5000.00	0.00
1881	National Telephone Co (teleg)	82	-	2665.00	-100.00[14]	2422.99	-100.00	2422.99	-100.00
1723	Chelsea Waterworks (water)	83	-	2650.00	-100.00[15]	906.16	-100.00	906.16	-100.00
1845	Midland, Gt. Western of Ireland Rly (rail)	84	-	2643.00	-100.00[16]	2370.00	-100.00	2370.00	-100.00
1824	Alliance Assurance Co Ltd (insur)	85	30	2625.00	232.38	550.00	81.82	5000.00	9.00
1848	Liverpool United Gas Light Co (gas)	86	-	2594.00	-100.00[17]	1239.10	-100.00	1239.10	-100.00
1853	London Chatham and Dover Rly (rail)	87	-	2590.00	-100.00[18]	11259.28	-100.00	11259.28	-100.00
1864	London & Provincial Bank Ltd (bank)	88	76	2580.00	48.26	600.00	66.67	1200.00	66.67
1889	Linotype Co (misc)	89	-	2572.00	-100.00[19]	2015.00	-100.00	2015.00	-100.00
1862	Standard Bank of South Africa (bank)	90	81	2560.00	42.15	1000.00	54.85	4000.00	54.85
1870	London and S. African Exploration (invest co)	91	-	2500.00	-100.00[20]	100.00	-100.00	100.00	-100.00

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1889	Randfontein Estates Gold Mines (mine)	92	68	2500.00	68.76	2000.00	50.00	2000.00	50.00
1836	Colonial Bank (bank)	93	-	2460.00	-100.00[21]	3600.00	-100.00	12000.00	-100.00
1867	Vickers Limited (iron)	94	42	2438.00	165.59	750.00	393.33	750.00	393.33
1836	Northern Assurance Limited (insur)	95	124	2430.00	1.85	300.00	0.00	3000.00	0.00
1838	Clydesdale Bank Litd (bank)	96	100	2425.00	24.74	1000.00	0.00	5000.00	0.00
1720	Royal Exchange Fire, Life & Marine (insur)	97	-	2412.00	-100.00[22]	689.22	-100.00	689.22	-100.00
1893	Geldenhuis Deep Mines (mine)	98	-	2325.00	-100.00[23]	300.00	-100.00	300.00	-100.00
1833	Commercial Gas Co (gas)	99	-	2325.00	-100.00[24]	746.48	-100.00	746.48	-100.00
1864	Bolckow, Vaughan and Co Ltd (iron)	100	113	2304.00	18.71	2746.30	1.69	3490.66	0.00
1836	Ulster Bank Ltd (bank)	101	-	2273.00	-100.00[25]	450.00	-100.00	2700.00	-100.00
1897	London & Globe Finance Corp (investment co)	102	-	2250.00	-100.00[26]	2000.00	-100.00	2000.00	-100.00
1782	Phoenix Assurance Ltd (insur)	103	92	2232.00	45.56	268.88	57.27	2688.80	19.41
1888	Ferreira Mines (mine)	104	-	2228.00	-100.00[27]	90.00	-100.00	90.00	-100.00
1877	Distillers Ltd (misc)	105	-	2219.00	-100.00[28]	887.68	-100.00	887.68	-100.00
1836	North & South Wales Bank (bank)	106	-	2190.00	-100.00[29]	600.00	-100.00	2400.00	-100.00
1861	Commercial Union Assurance Co (insur)	107	38	2175.00	218.76	250.00	18.00	2500.00	18.00
1719	New River Water Co (water)	108	-	2173.00	-100.00[30]	500.00	-100.00	500.00	-100.00
1873	Brazilian Submarine Telegraph (teleg) later Western Telegraph	109	115	2133.00	26.72	1375.00	51.22	1375.00	51.22
1889	Champion Reef Gold Mines Ltd (mine)	110	-	2118.00	-100.00[31]	220.00	-100.00	220.00	-100.00
1885	Broken Hill Proprietary Mines (mine)	111	-	2100.00	-100.00[32]	384.00	-100.00	384.00	-100.00
1720	London Assur Corp, Fire, Life & Marine (insur)	112	-	2080.00	-100.00[33]	448.27	-100.00	896.55	-100.00
1862	London & South-Western Bank Ltd (bank)	113	85	2070.00	69.08	600.00	66.67	1500.00	66.67
1880	Nettlefold Ltd (misc: engineering)	114	-	2058.00	-100.00[34]	420.00	-100.00	420.00	-100.00
1821	Guardian Fire and Life Insurance Co (insur)	115	-	2050.00	-100.00[35]	1000.00	-100.00	2000.00	-100.00
1865	Liebig's Extract of Meat (misc. food)	116	125	2050.00	17.07	500.00	20.00	500.00	20.00
1830	York City & County Banking Co (bank)	117	-	2027.00	-100.00[36]	491.30	-100.00	1637.68	-100.00
1895	Bank of Australiasia (bank)	118	63	2000.00	128.00	1600.00	0.00	1600.00	0.00
1855	City Bank Ltd (bank)	119	-	2000.00	-100.00[37]	1000.00	-100.00	4000.00	-100.00
1862	Aerated Bread Ltd (misc: food)	120	-	1986.00	-100.00[38]	155.80	-100.00	155.80	-100.00
1895	City and Suburban Mines (mine)	121	-	1976.00	-100.00[39]	1360.00	-100.00	1360.00	-100.00
1855	Sheffield United Gas Light (gas)	122	-	1965.00	-100.00[40]	791.48	-100.00	791.48	-100.00
1865	Highland Rly (rail)	123	-	1910.00	-100.00[41]	2564.38	-100.00	2564.38	-100.00
1894	Howard & Bullough Ltd (misc. engineering)	124	-	1900.00	-100.00[42]	500.00	-100.00	500.00	-100.00

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

				Ordinary capital		Total paid up (PAR)		Total nominal	
		Rank by size of ordinary cap. market value		Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change 1898-1913 or amount 1913 (£'000)	Amount 1898 (£'000)	% change or amount 1913 (£'000)
Created	Name	1898	1913						
1894	Associated Gold of Western Australia (mine)	125	-	1875.00	-100.00[43]	500.00	-100.00	500.00	-100.00

Notes: Table 6

The following notes relate to the top companies of 1898 that did not appear in the 1913 list. Values in £'000.

[1] London and County Bank merged with London and Westminster Bank to form London, County and Westminster Bank.
[2] London and County Bank merged with London and Westminster Bank to form London, County and Westminster Bank.
[3] In liquidation. Assets transferred to Consolidated Gold fields of South Africa for two fully paid Consolidated shares plus 4/- bonus for each share held.
[4] At £1,719, below 1913 top 125 cut-off of £2,388.
[5] Absorbed by Metropolitan Water Board (unquoted).
[6] Absorbed by Metropolitan Water Board (unquoted).
[7] Merged with Smiths Bank to form Union of London and Smiths Bank.
[8] At £1,875, below 1913 top 125 cut-off of £2,388.
[9] Absorbed by Metropolitan Water Board (unquoted).
[10] Merged with East and West India Docks in January 1901 to form London and India Docks Company. Subsequently transferred to Port of London Authority (unquoted) in March 1909.
[11] Absorbed by Metropolitan Water Board (unquoted).
[12] At £1,804, below 1913 top 125 cut-off of £2,388.
[13] Absorbed by Metropolitan Water Board (unquoted).
[14] Purchased by Post Office (unquoted) in December 1911.
[15] Absorbed by Metropolitan Water Board (unquoted).
[16] At £1,232, below 1913 top 125 cut-off of £2,388.
[17] At £2,260, below 1913 top 125 cut-off of £2,388.
[18] At £2,097, below 1913 top 125 cut-off of £2,388.
[19] After voluntary liquidation in 1904, this firm merged with Machinery Trust, Ltd. to become Linotype and Machinery Trust, Ltd., whose equity was not quoted in 1913.
[20] After voluntary liquidation in 1900, this firm's assets were transferred to De Beers for £1,625, giving shareholders £16 per 10/- share (nominal).
[21] At £625, below 1913 top 125 cut-off of £2,388.
[22] At £1,396, below 1913 top 125 cut-off of £2,388.
[23] At £879, below 1913 top 125 cut-off of £2,388.
[24] At £2,181, below 1913 top 125 cut-off of £2,388.
[25] At £2,100, below 1913 top 125 cut-off of £2,388.
[26] By 1913, no longer quoted by *IMM*.
[27] Wound up in January 1912 by merger with Ferreira Deep, with a distribution of one Ferreira Deep share and 10/- cash being made per share.
[28] At £2,113, below 1913 top 125 cut-off of £2,388.
[29] Merged with London, City and Midland Bank (No. 17 in 1913).
[30] Absorbed by Metropolitan Water Board (unquoted).

Notes: Table 6 [Cont.]

The following notes relate to the top companies of 1898 that did not appear in the 1913 list. Values in £'000.

[31] At £1,105, below 1913 top 125 cut-off of £2,388.
[32] At £1,650, below 1913 top 125 cut-off of £2,388.
[33] At £1,829, below 1913 top 125 cut-off of £2,388.
[34] Merged with Guest, Keen to form Guest, Keen and Nettlefolds (No. 102 in 1913).
[35] At £1,850, below 1913 top 125 cut-off of £2,388.
[36] By 1913, no longer quoted by *IMM*.
[37] Merged with London and Midland Bank to form London, City and Midland Bank (No. 17 in 1913) in November 1898.
[38] At £748, below 1913 top 125 cut-off of £2,388.
[39] At £850, below 1913 top 125 cut-off of £2,388.
[40] At £1,959, below 1913 top 125 cut-off of £2,388.
[41] At £1,032, below 1913 top 125 cut-off of £2,388.
[42] At £1,875, below 1913 top 125 cut-off of £2,388.
[43] At £186, below 1913 top 125 cut-off of £2,388.

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

	Total issued no. shares		Cash Dividends		Total non-equity mkt. cap		Total non-equity nominal cap	
Name	Number 1898 (000)	% change 1898-1913 or number 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)
British American Tobacco Co (misc: tobacco)	0.00	6252.17	0.00	1656.80	0.00	2179.00	0.00	2100.00
'Shell "Transport and Trading Co (oil)	0.00	3008.77	0.00	902.63	0.00	1556.00	0.00	1500.00
London County and Westminster Bank (bank)	0.00	700.00	0.00	743.75	0.00	0.00	0.00	0.00
Crown Mines (mine)	0.00	1880.21	0.00	1034.10	0.00	0.00	0.00	0.00
Imperial Tobacco (Gt. Bn & I) (Misc. tobac)	0.00	7898.69	0.00	262.82	0.00	6354.00	0.00	4959.25
Barclay and Co. (bank)	0.00	450.00	0.00	464.94	0.00	0.00	0.00	0.00
Union of London & Smiths Bank (bank)	0.00	229.34	0.00	426.57	0.00	0.00	0.00	0.00
Maypole Dairy Co. (retail: misc)	0.00	3650.00	0.00	485.62	0.00	394.00	0.00	350.00
Burmah Oil Co. (oil)	0.00	1905.00	0.00	381.00	0.00	1448.00	0.00	1240.00
New Jagersfontein Mine (mine)	0.00	850.00	0.00	382.50	0.00	0.00	0.00	0.00
L þool & London & Globe Insurance Co (insur)	0.00	245.64	0.00	270.20	0.00	1221.00	0.00	1250.65
Randfontein Central Mine (mine)	0.00	4000.00	0.00	500.00	0.00	0.00	0.00	0.00
Babcock and Wilcox (iron)	0.00	1660.00	0.00	265.60	0.00	131.00	0.00	100.00
Anglo-American Telegraph Co. (teleg)	0.00	70.00	0.00	262.50	0.00	0.00	0.00	0.00
Met. Carriage, Wagon & Finance (misc: engin)	0.00	1424.71	0.00	213.71	0.00	587.00	0.00	483.13
Modderfontein (New) Mine (mine)	0.00	350.00	0.00	420.00	0.00	0.00	0.00	0.00
London & Brazilian Bank (bank)	0.00	125.00	0.00	250.00	0.00	0.00	0.00	0.00
Premier (Transvaal) Diamond Mine (mine)	0.00	320.00	0.00	400.00	0.00	1400.00	0.00	40.00
Central Mining and Investment Co. (mine)	0.00	425.00	0.00	255.00	0.00	0.00	0.00	0.00
Chartered Bank of India, Austral & China (bank)	0.00	60.00	0.00	198.00	0.00	0.00	0.00	0.00
City Deep Mine (mine)	0.00	1250.00	0.00	281.25	0.00	0.00	0.00	0.00
Fine Cotton Spinners and Doublers (misc cotton)	0.00	2250.00	0.00	180.00	0.00	6058.00	0.00	5750.00
Union Bank of Australia (bank)	0.00	60.00	0.00	210.00	0.00	594.00	0.00	600.00
Fife Coal Co. (coal)	0.00	816.26	0.00	224.47	0.00	483.00	0.00	417.81
London and Lancashire Fire Insurance (insur)	0.00	105.65	0.00	132.06	0.00	0.00	0.00	0.00
Lena Goldfields (mine)	0.00	1154.47	0.00	230.89	0.00	0.00	0.00	0.00
Kyshim Corporation (Russian mine)	0.00	1000.00	0.00	50.00	0.00	0.00	0.00	0.00
Kellner-Partington Co. (misc. Chemicals)	0.00	910.30	0.00	182.06	0.00	968.00	0.00	950.00
Lancashire and Yorkshire Bank (bank)	0.00	86.27	0.00	146.65	0.00	0.00	0.00	0.00
Guest, Keen and Nettlefolds (iron)	0.00	965.00	0.00	144.75	0.00	3708.00	0.00	3570.50
Ferreira Deep Mine (mine)	0.00	980.00	0.00	465.50	0.00	0.00	0.00	0.00

Table 6: Causes of changes in the market capitalization of the ordinary shares of the top British companies 1898-1913:

	Total issued no. shares		Cash Dividends		Total non-equity mkt. cap		Total non-equity nominal cap	
Name	Number 1898 (000)	% change 1898-1913 or number 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)	Amount 1898 (000)	% change 1898-1913 or amount 1913 (000)
Furness, Withy and Co (ships)	0.00	2000.00	0.00	200.00	0.00	1425.00	0.00	1500.00
Arizona Copper Mine (mine)	0.00	1519.90	0.00	246.98	0.00	0.00	0.00	0.00
Marconi's Wireless Telegraph (teleg)	0.00	750.00	0.00	150.00	0.00	781.00	0.00	250.00
Pacific Phosphate Co. (misc)	0.00	750.00	0.00	140.62	0.00	156.00	0.00	125.00
Anglo-South American Bank (bank)	0.00	330.00	0.00	198.00	0.00	0.00	0.00	0.00
British Bank of South Africa (bank)	0.00	100.00	0.00	200.00	0.00	0.00	0.00	0.00
Modderfontein "B" Mine (mine)	0.00	700.00	0.00	280.00	0.00	0.00	0.00	0.00
Lyons (J) & Co (misc: retail)	0.00	756.00	0.00	151.30	0.00	931.00	0.00	925.00
Powell-Duffryn Steam Coal Co (coal)	0.00	825.00	0.00	123.75	0.00	193.00	0.00	155.79
London and Blackwall Rly (rail)	0.00	23.21	0.00	104.47	0.00	1124.00	0.00	1064.06
United Counties Bank (bank)	0.00	298.33	0.00	156.62	0.00	0.00	0.00	0.00
Brakpan Mine (mine)	0.00	750.00	0.00	337.50	0.00	0.00	0.00	0.00
London and N. Western Rly (rail)	408.14	5.09	2908.00	-4.13	100575.00	-26.58	75716.12	8.29
Midland Rly (rail)	698.33	11.81	1134.80	119.18	90540.00	-14.68	96056.74	28.52
Bank of England (bank)	145.53	0.00	1455.30	-10.00	0.00	0.00	0.00	0.00
North-Eastern Rly (rail)	276.38	15.86	1761.90	9.04	56510.00	-24.06	43490.53	12.28
Great Western Rly (rail)	243.96	47.96	1463.80	38.71	98270.00	-24.22	57924.07	9.86
London and S. Western Rly (rail)	142.68	53.01	826.65	-3.42	35080.00	-16.58	27061.89	26.08
Caledonian Rly (rail)	279.36	25.86	801.58	-22.25	41036.00	-12.31	27882.53	28.31
Lancashire and Yorkshire Rly (rail)	168.41	11.76	857.98	-9.51	49120.00	-18.57	43373.47	18.22
De Beers Mines (mine)	792.66	127.08	1579.60	124.74	3546.00	-54.29	3283.02	-49.36
Great Northern Rly (rail)	204.99	0.60	590.87	11.31	42751.00	-19.94	32892.82	18.89
Coats, J & P (misc)	300.00	1410.00	600.00	425.00	6770.00	-46.45	4500.00	-44.44
Gas Light and Coke (gas)	60.22	172.59	755.07	5.79	10810.00	-14.07	5308.00	113.58
South-Eastern Rly (rail)	100.43	0.06	623.16	-36.67	51235.00	-56.28	29626.07	-24.86
Great Eastern Rly (rail)	125.73	22.19	314.32	22.19	52532.00	-27.80	36427.25	6.67
London, Brighton & S. Coast Rly (rail)	84.31	25.62	554.51	-2.97	28608.00	-24.22	16329.14	14.54
Guinness (Arthur), Son & Co (brewr)	25.00	100.00	500.00	65.00	5590.00	-49.02	3500.00	-42.86
National Provincial Bank of England (bank)	255.00	0.00	450.00	20.00	0.00	0.00	0.00	0.00
Bank of Ireland (bank)	30.00	-7.69	345.00	-19.73	0.00	0.00	0.00	0.00
Armstrong (Sir W.G) Whitworth & Co (iron)	3210.00	0.00	427.89	-6.23	471.00	595.33	384.85	809.45
North British Rly (rail)	159.05	35.67	274.92	48.17	47649.00	-19.25	39991.23	9.23
London & County Banking Co (bank)	100.00	-100.00	440.00	-100.00	0.00	0.00	0.00	0.00

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Rand Mines (mine)	332.71	539.00	0.00	1.17	0.00	0.00	0.00	0.00
Metropolitan Rly (rail)	79.23	14.89	198.07	-100.00	9941.00	-8.10	6967.37	56.34
Rio Tinto Mines (mine)	325.00	15.38	650.00	159.62	5559.00	-69.31	5143.22	-68.41
London & Westminster Bank (bank)	140.00	-100.00	350.00	-100.00	0.00	0.00	0.00	0.00
Lloyds Bank Ltd (bank)	255.00	106.31	357.00	118.10	0.00	0.00	0.00	0.00
Imperial Continental Gas (gas)	38.00	30.00	380.00	17.00	37947.00	-97.20	38113.60	-96.76
South Metropolitan Gas Co (gas)	55.31	16.25	290.39	21.04	1497.00	-6.35	1460.00	29.82
Glasgow & South Western Rly (rail)	103.31	22.49	123.20	141.62	31379.00	-61.63	10076.96	21.85
Gt. Southern & Western of Ireland Rly (rail)	49.71	87.09	267.20	-0.34	5210.00	-20.67	3640.12	14.64
Eastern Telegraph Ltd (teleg)	400.00	-90.00	250.00	12.00	3312.00	0.72	2222.69	75.31
Royal Insurance Co Ltd (insur)	125.23	135.13	237.93	63.98	0.00	835.00	0.00	843.80
Great Northern of Ireland Rly (rail)	35.42	14.26	230.22	-9.91	5663.00	-17.18	3955.38	18.23
London City and Midland Bank (bank)	117.42	171.80	249.51	187.79	0.00	0.00	0.00	0.00
British Linen Company (bank)	12.50	0.00	225.00	5.56	0.00	0.00	0.00	0.00
Parr's Bank Ltd (bank)	66.00	234.06	250.00	80.22	0.00	0.00	0.00	0.00
Consolidated Gold Fields of S. Africa (mine)	1350.00	48.15	675.00	-55.56	1964.00	29.63	1850.00	45.95
Manchester & L'pool District Bank (bank)	100.00	58.00	200.00	65.90	0.00	0.00	0.00	0.00
Goldfields Deep Mine (mine)	600.0	-100.00	0.00	0.00	0.00	0.00	0.00	0.00
Great Central Rly (rail)	95.53	11.57	41.21	-100.00	18995.00	116.49	14360.52	196.60
Mount Morgan Mine (mine)	1000.00	0.00	300.00	-33.33	0.00	0.00	0.00	0.00
Royal Bank of Scotland (bank)	20.00	0.00	160.00	37.50	0.00	0.00	0.00	0.00
North British and Mercantile Insurance (insur)	110.00	0.00	165.00	33.33	0.00	1680.00	0.00	1750.00
North London Rly (rail)	20.20	35.34	151.53	-36.23	3229.00	-57.23	1914.37	-35.70
Great Northern & Telegraph Co (teleg)	150.00	0.00	150.00	100.00	162.00	-100.00	160.00	-100.00
P&O Steam Navigation (shipping)	23.20	-50.00	150.80	15.38	936.00	339.64	800.00	417.50
Eastern Ext., Austral and China (teleg)	250.00	20.00	175.00	20.00	571.00	21.19	488.60	53.99
Bank of Scotland (bank)	12.50	-29.33	150.00	16.60	0.00	0.00	0.00	0.00
Robinson Mines (mine)	550.00	-100.00	206.25	-100.00	0.00	0.00	0.00	0.00
Commercial Bank of Scotland Ltd (bank)	50.00	0.00	160.00	25.00	0.00	0.00	0.00	0.00
National Bank of Scotland (bank)	10.00	0.00	160.00	25.00	0.00	0.00	0.00	0.00
North Staffordshire Rly (rail)	32.30	11.28	141.32	11.28	8350.00	-28.84	6849.32	41.76
London Joint Stock Bank Ltd (bank)	120.00	65.00	180.00	75.89	0.00	0.00	0.00	0.00
Lambeth Waterworks (water)	14.50	-100.00	133.54	-100.00	499.00	-100.00	350.00	-100.00

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Taff Vale Rly (rail)	51.92	0.00	175.24	11.12	4161.00	-0.91	3321.57	39.36
Rylands and Sons (misc)	100.00	0.00	202.71	-18.50	0.00	0.00	0.00	0.00
East London Waterworks (water)	17.21	-100.00	133.34	-100.00	1457.00	-100.00	1044.74	-100.00
Tharsis Sulphur and Copper Mines (mine)	625.00	0.00	156.25	60.00	0.00	0.00	0.00	0.00
Union Bank of London (bank)	110.00	-100.00	179.03	-100.00	0.00	0.00	0.00	0.00
Simmer and Jack Proprietary Mine (mine)	1000.00	-100.00	0.00	0.00	505.00	-100.00	500.00	-100.00
Capital and Counties Bank Ltd (bank)	93.25	87.67	149.20	87.67	0.00	0.00	0.00	0.00
Brunner, Mond and Co (misc)	138.17	1997.32	237.71	164.68	942.00	138.85	523.26	186.66
Hongkong and Shanghai Banking Co (bank)	80.00	50.00	200.00	155.00	0.00	0.00	0.00	0.00
East Rand Proprietary Mine (mine)	750.00	226.12	0.00	0.61	0.00	0.00	0.00	0.00
West Middlesex Water (water)	11.55	-100.00	115.51	-100.00	327.00	-100.00	200.00	-100.00
Manchester and County Bank (bank)	54.600	400.00	131.04	-41.04	0.00	0.00	0.00	0.00
Williams, Deacon's Bank Ltd (bank)	125.00	25.00	125.00	50.00	0.00	0.00	0.00	0.00
Bank of Liverpool Ltd (bank)	80.00	606.25	130.00	62.98	0.00	0.00	0.00	0.00
London & St. Katherine's Docks (dock)	57.57	-100.00	143.92	-100.00	6164.00	-100.00	4636.25	-100.00
National Bank Ltd (bank)	150.00	0.00	135.00	11.11	0.00	0.00	0.00	0.00
London and River Plate Bank Ltd (bank)	60.00	100.00	180.00	133.30	0.00	0.00	0.00	0.00
Wilts and Dorset Banking Co Ltd (bank)	60.00	16.67	120.00	16.67	0.00	0.00	0.00	0.00
Nobel Dynamite Trust Limited (misc)	175.40	30.30	210.48	8.58	0.00	1100.00	0.00	1000.00
Consett Iron Ltd (iron)	100.00	0.00	150.00	141.65	0.00	856.00	500.00	0.00
Kent Waterworks (water)	8.68	-100.00	114.44	-100.00	0.00	0.00	0.00	0.00
European Gas Limited (misc)	144.01	-100.00	82.68	-100.00	0.00	0.00	0.00	0.00
Grand Junction Waterworks (water)	27.88	-100.00	91.80	-100.00	421.00	-100.00	295.00	-100.00
Mysore Gold Mining Co (mine)	500.00	22.00	312.50	22.00	0.00	0.00	0.00	0.00
Barry Rly (rail)	16.00	95.58	98.12	40.33	3593.00	-26.08	2699.99	7.36
Sun Insurance Office (insur)	240.00	0.00	90.00	86.67	0.00	0.00	0.00	0.00
Union Bank of Scotland (bank)	100.00	0.00	110.00	36.36	0.00	0.00	0.00	0.00
National Telephone Co (teleg)	484.60	-100.00	145.38	-100.00	2512.00	-100.00	2225.64	-100.00
Chelsea Waterworks (water)	9.06	-100.00	78.35	-100.00	543.00	-100.00	325.79	-100.00
Midland, Gt. Western of Ireland Rly (rail)	23.70	-100.00	97.76	-100.00	5699.00	-100.00	3945.57	-100.00
Alliance Assurance Co Ltd (insur)	250.00	180.00	100.00	320.00	0.00	0.00	0.00	0.00
Liverpool United Gas Light Co (gas)	12.39	-100.00	103.57	-100.00	419.00	-100.00	306.08	-100.00
London Chatham and Dover Rly (rail)	112.59	-100.00	0.00	0.00	22322.00	-100.00	15638.24	-100.00

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London & Provincial Bank Ltd (bank)	120.00	66.67	105.00	80.95	0.00	0.00	0.00	0.00
Linotype Co (misc)	403.00	-100.00	18.00	-100.00	0.00	0.00	0.00	0.00
Standard Bank of South Africa (bank)	40.00	674.26	160.00	30.66	0.00	0.00	0.00	0.00
London and S. African Exploration (invest co)	200.00	-100.00	80.00	-100.00	0.00	0.00	0.00	0.00
Randfontein Estates Gold Mines (mine)	2000.00	50.00	0.00	0.38	0.00	0.00	0.00	0.00
Colonial Bank (bank)	120.0	-100.00	36.00	-100.00	0.00	0.00	0.00	0.00
Vickers Limited (iron)	750.00	393.33	112.50	228.89	3097.00	32.32	2700.00	53.65
Northern Assurance Limited (insur)	30.00	900.00	90.00	33.33	0.00	0.00	0.00	0.00
Clydesdale Bank Litd (bank)	100.00	0.00	100.00	50.00	0.00	0.00	0.00	0.00
Royal Exchange Fire, Life & Marine (insur)	6.89	-100.00	96.49	-100.00	0.00	0.00	0.00	0.00
Geldenhuis Deep Mines (mine)	300.00	-100.00	90.00	-100.00	0.00	0.00	0.00	0.00
Commercial Gas Co (gas)	7.46	-100.00	94.88	-100.00	295.00	-100.00	196.31	-100.00
Bolckow, Vaughan and Co Ltd (iron)	174.53	1900.00	137.31	0.00	596.00	-14.93	472.08	0.00
Ulster Bank Ltd (bank)	180.00	-100.00	90.00	-100.00	0.00	0.00	0.00	0.00
London & Globe Finance Corp (investment co)	2000.00	-100.00	0.00	-100.00	0.00	0.00	0.00	0.00
Phoenix Assurance Ltd (insur)	53.78	686.33	94.11	23.43	0.00	1235.00	0.00	1277.95
Ferreira Mines (mine)	90.00	-100.00	135.00	-100.00	0.00	0.00	0.00	0.00
Distillers Ltd (misc)	88.77	-100.00	110.96	-100.00	0.00	0.00	45000.00	-100.00
North & South Wales Bank (bank)	60.00	-100.00	90.00	-100.00	0.00	0.00	0.00	0.00
Commercial Union Assurance Co (insur)	50.00	490.00	75.00	254.00	332.00	474.70	300.00	562.62
New River Water Co (water)	5.00	-100.00	33.13	-100.00	2152.00	-100.00	1500.00	-100.00
Brazilian Submarine Telegraph (teleg) later Western Telegraph	130.75	59.03	91.00	59.95	0.00	749.00	0.00	818.67
Champion Reef Gold Mines Ltd (mine)	440.00	-100.00	231.00	-100.00	0.00	0.00	0.00	0.00
Broken Hill Proprietary Mines (mine)	960.00	-100.00	240.00	-100.00	0.00	0.00	0.00	0.00
London Assur Corp, Fire, Life & Marine (insur)	35.86	-100.00	89.65	-100.00	0.00	0.00	0.00	0.00
London & South-Western Bank Ltd (bank)	30.00	733.33	78.00	117.95	0.00	0.00	0.00	0.00
Nettlefold Ltd (misc: engineering)	42.00	-100.00	63.00	-100.00	320.00	-100.00	210.00	-100.00
Guardian Fire and Life Insurance Co (insur)	200.00	-100.00	70.00	-100.00	0.00	0.00	0.00	0.00
Liebig's Extract of Meat (misc. food)	25.00	380.00	100.00	35.00	0.00	1025.00	0.00	1000.00
York City & County Banking Co (bank)	163.77	-100.00	81.88	-100.00	0.00	0.00	0.00	0.00
Bank of Australiasia (bank)	40.00	0.00	80.00	240.00	0.00	0.00	0.00	0.00
City Bank Ltd (bank)	100.00	-100.00	95.00	-100.00	0.00	0.00	0.00	0.00

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Aerated Bread Ltd (misc: food)	155.80	-100.00	58.42	-100.00	0.00	0.00	0.00	0.00
City and Suburban Mines (mine)	340.00	-100.00	105.40	-100.00	0.00	0.00	0.00	0.00
Sheffield United Gas Light (gas)	7.91	-100.00	79.15	-100.00	0.00	0.00	0.00	0.00
Highland Rly (rail)	25.64	-100.00	28.85	-100.00	5187.00	-100.00	3669.37	-100.00
Howard & Bullough Ltd (misc. engineering)	50.00	-100.00	60.00	-100.00	670.00	-100.00	500.00	-100.00
Associated Gold of Western Australia (mine)	500.00	-100.00	100.00	-100.00	0.00	0.00	0.00	0.00

TABLE 7

CONSOL YIELDS *VS.* DIVIDEND YIELDS, SELECTED YEARS, 1868-1913

	(1)	(2)	(3)	(4)	(5)
	CONSOL YIELD TO MATURITY	CONSOL ANNUAL COUPON	CONSOL CURRENT YIELD	CONSOL PRICE	TOP 125-COMPANY DIVIDEND YIELD
1868	3.164%	£3.00	3.16%	£ 95	4.90%
1883	2.841%	£2.50	2.84%	£ 88	4.49%
1888	2.628%	£2.50	2.63%	£ 95	4.11%
1898	2.286%	£2.75	2.48%	£ 111	3.60%
1913	3.454%	£2.75	3.25%	£ 77	5.52%

Sources:

Cols. (1) and (2): Klovland (1994), Appendix.

Col. (3): Coupon divided by price (not annualized).

Col. (4): *The Economist* (various years, end-June issue), regular table reporting closing prices of British government securities.

Col.(5): Table 5 above.

TABLE 8

GOVERNMENT BENCHMARK BOND YIELDS *VS.* DIVIDEND YIELDS
NOVEMBER 2000

EQUITY INDEX	DIVIDEND YIELD ON EQUITY INDEX	BOND MATURITY COUPON	CURRENT YIELD (ANNUALIZED)	BID PRICE (17 NOV 2000)
FTSE 100 (17 NOV 2000)	2.05%	UK 12/09 £5.75	5.09%	£104.75
FTSE UK SECTION ALL-WORLD INDEX SERIES (16 NOV 2000)	2.1%	UK 12/28 £6.00	4.51%	£123.62
FTSE US SECTION ALL-WORLD INDEX SERIES (16 NOV 2000)	1.2%	US 08/10 $5.75	5.70%	$100.34
DOW JONES INDUSTRIAL AVERAGE (10 NOV 2000)	1.67%	US 5/30 $6.25	5.78%	$106.66

Source: *Financial Times,* November 18/19, 2000, pp.22-23, 30.

TABLE 9

ALL-COMPANY (125) APPROXIMATE OUT-TURN OF TOTAL RETURN*

		COL. (1)		COL.(2)		COL.(3)	
		Average Annual Dividend Growth	Average Annual Dividend Growth	Average Annual Capital Apprec.	Average Annual Capital Apprec.	Total Return (1)+(2)= (3)	Total Return (1)+(2)= (3)
1. 1868-1883		3.80%		4.41%		8.21%	
2. 1883-1889		1.62%		3.12%		4.47%	
	2a. 1883-1888		-0.34%		1.48%		1.14%
	2b. 1888-1898		2.59%		3.96%		6.65%
3. 1898-1913		3.65%		0.74%		4.39%	

* No allowance is made for new capital issued or for index drift.

TABLE D

ALL-COMPANY (125) ESTIMATE OF RISK PREMIUM

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
1.1868-1883 Extrapol	4.90%	N/A	N/A	N/A	N/A	N/A	N/A
1868-1883 Perfect Fore-sight	4.90%	5.09%	3.80%	3.16%	2.46%	5.73%	6.43%
2.1883-1898 Extrapol	4.49%	4.66%	3.80%	2.84%	3.22%	5.62%	6.43%
1883-1898 Perfect Fore-sight	4.49%	4.56%	1.62%	2.84%	3.22%	3.34%	2.96%

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
2a. 1883-1888 Extrapol.	4.49%	4.64%	3.36%	2.84%	3.22%	5.16%	4.78%
1883-1888 Perfect Fore-sight	4.49%	4.48%	-0.34	2.84%	3.22%	1.30%	0.92%
2b. 1888-1898 Extrapol.	4.11%	4.17%	1.51%	2.63%	2.53%	3.05%	3.15%
1888-1898 Perfect Fore-sight	4.11%	4.22%	2.59%	2.63%	2.53%	4.18%	4.28%

TABLE 10

ALL-COMPANY (125) ESTIMATE OF RISK PREMIUM

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
1.1868-1883 Extrapol	4.90%	N/A	N/A	N/A	N/A	N/A	N/A
1868-1883 Perfect Fore-sight	4.90%	5.09%	3.80%	3.16%	2.46%	5.73%	6.43%
2.1883-1898 Extrapol	4.49%	4.66%	3.80%	2.84%	3.22%	5.62%	6.43%
1883-1898 Perfect Fore-sight	4.49%	4.56%	1.62%	2.84%	3.22%	3.34%	2.96%

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
2a. 1883-1888 Extrapol.	4.49%	4.64%	3.36%	2.84%	3.22%	5.16%	4.78%
1883-1888 Perfect Fore-sight	4.49%	4.48%	-0.34	2.84%	3.22%	1.30%	0.92%
2b. 1888-1898 Extrapol.	4.11%	4.17%	1.51%	2.63%	2.53%	3.05%	3.15%
1888-1898 Perfect Fore-sight	4.11%	4.22%	2.59%	2.63%	2.53%	4.18%	4.28%

[Table 10 Cont.]

TABLE 10 [Cont.]

ALL-COMPANY (125) ESTIMATE OF RISK PREMIUM

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
3.1898-1913 Extrapol	3.60%	3.66%	1.62%	2.29%	2.62%	2.99%	2.66%
1898-1913 Perfect Fore-sight	3.60%	3.73%	3.65%	2.29%	2.62%	5.09%	4.76%
4.1913 Extrapol	5.52 %	5.72%	3.65%	3.45 %	4.36%	5.92%	5.01%
1913-1928 Perfect Fore-sight	5.52 %	?	?	3.45 %	4.36%	?	?

Average Risk Premium, 1868-1913 (10 observations): 4.26 4.02

TABLE 11

RAILWAYS: ESTIMATE OF RISK PREMIUM, 1868-1913

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
1.1868-1883 Extrapol.	4.72 %	N/A	N/A	N/A	N/A	N/A	N/A
1868-1883 Perfect Fore-sight	4.72 %	4.92%	4.16 %	3.16%	2.46%	5.92%	6.62 %
2.1883-1898 Extrapol.	4.12 %	4.29 %	4.16 %	2.84 %	3.22%	5.61 %	5.23 %
1883-1898 Perfect Fore-sight	4.12 %	4.14 %	0.53 %	2.84 %	3.22%	1.83 %	1.45 %
2a. 1883-1888 Extrapol.	4.12 %	4.29 %	4.09 %	2.84 %	3.22 %	5.54 %	5.16 %
1883-1888 Perfect Fore-sight	4.12 %	4.03 %	-2.15	2.84%	3.22%	-0.96 %	-1.34 %
2b. 1888-1898 Extrapol.	3.59 %	3.62 %	0.92 %	2.63%	2.53%	1.91 %	2.01 %
1888-1898 Perfect Fore-sight	3.59 %	3.66 %	1.90 %	2.63 %	2.53 %	2.93 %	3.03 %
3.1898-1913 Extrapol.	3.02 %	3.04 %	0.53 %	2.29 %	2.62 %	1.28 %	0.95 %
1898-1913 Perfect Fore-sight	3.02 %	3.04 %	0.63 %	2.29 %	2.62 %	1.38 %	1.05 %
4.1913-1928 Extrapol.	4.62 %	4.65 %	0.63 %	3.45 %	4.36 %	1.83 %	0.92 %
1913-1928 Perfect Fore-sight	4.62 %	?	?	3.45 %	4.36 %	?	?

TABLE 11a

RAILWAYS: APPROXIMATE OUT-TURN OF TOTAL RETURN, 1868-1913*

		COL. (1)		COL.(2)		COL.(3)	
		Average Annual Dividend Growth	Average Annual Dividend Growth	Average Annual Capital Apprec.	Average Annual Capital Apprec.	Total Return (1)+(2)= (3)	Total Return (1)+(2)= (3)
1. 1868-1883		4.16 %		5.12 %		9.28 %	
2. 1883-1889		0.53%		2.46%		2.99%	
	2a. 1883-1888		-2.15%		0.62%		-1.53%
	2b. 1888-1898		1.90%		3.39%		5.29%
3. 1898-1913		0.63%		-2.02%		-1.39%	

* No allowance is made for new capital issued or for index drift.

TABLE 12

BRUNNER, MOND: ESTIMATE OF RISK PREMIUM, 1868-1913

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June)	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
1888-1898 Perfect Foresight	8.44 %	8.89 %	5.34 %	2.63 %	2.53%	11.60 %	11.70 %
3.1898-1913 Extrapol.	6.44 %	6.78 %	5.34 %	2.29 %	2.62 %	9.83 %	9.50 %
1898-1913 Perfect Foresight	6.44 %	6.87 %	6.70 %	2.29 %	2.62 %	11.28 %	10.95 %
4.1913-1928 Extrapol.	5.19 %	5.43 %	6.73 %	3.45 %	4.36 %	8.68 %	7.77 %
1913-1928 Perfect Foresight	5.19 %	?	?	3.45 %	4.36 %	?	?
Average Risk premium, 1888-1913 (4 observations)						10.35	9.98

TABLE 12a

BRUNNER, MOND: OUT-TURN OF TOTAL RETURN, 1888-1913*

		COL. (1)		COL.(2)		COL.(3)	
		Average Annual Dividend Growth	Average Annual Dividend Growth	Average Annual Capital Apprec.	Average Annual Capital Apprec.	Total Return (1)+(2)= (3)	Total Return (1)+(2)= (3)
	2b. 1888-1898		5.34%		6.08%		11.42%
3. 1898-1913		6.70%		5.80%		12.50%	

* Includes new capital issues.

Table 13.

MARKET CAPITALIZATIONS AND DIVIDEND YIELDS OF THE ORDINARY SHARES OF SELECTED COMPANIES, 1873-1913

	All Ranking Mines		Tharsis		Rio Tinto		De Beers		Brunner, Mond	
	Market Capital-ization (£ m.)	Current Div Yield.	Market Capital -ization (£ ‘000)	Current Div Y’ld.	Market Capital-ization (£ ‘000)	Current Div Yield.	Market Capital-ization (£ ‘000)	Current Div Yield on Ords.	Market Cap. (£‘000)	Current Div Yield.
1873	£ 3.6	3.48%	£3,607	3.48%						
1878	£ 3.1	9.76%	£2,155	7.83%	£ 956[1]	14.1%				
1883	£ 11.0	7.10%	£3,964	8.15%	£6,988[2]	6.51%				
1888	£ 20.2	6.50%	£2,937	4.00%	£6,094[3]	5.33%	£ 3,544 £ 3,544*	8.93%	£ 1,644	8.44%
1893	£ 31.0	6.07%	£3,008	6.23%	£ 7,982	1.91%	£14,655 £18,472*	6.73%	£ 5,566	6.58%
1898	£ 90.2	5.33%	£3,906	4.00%	£ 8,450	7.69%	£21,323 £24,869*	7.41%	£ 3,693	6.44%
1903	£160.9	4.77%	£2,422	7.74%	£15,194	5.35%	£17,200 £35,269*	6.10%	£ 5,786	5.91%
1908	£121.3	5.96%	£3,438	7.27%	£24,094	3.70%	£10,889 £25,411*	8.04%	£ 9,814	6.00%
1913	£145.3	8.68%	£4,375	5.71%	£27,141	6.22%	£21,500 £36,721*	10.1%	£12,120	5.19%†

Sources:
All ranking mines: Table 5.
Individual companies: Benchmark year tables.

*Total market capitalization, all classes of traded assets. De Beer’s capital structure underwent large changes with some frequency. Gearing (by market valuation) was 21% in 1893. It had been zero in 1888. In 1908, by market valuation, preference shares accounted for 44% of De Beer’s capital structure, debentures for 13%, and equities for only 43%. The preference holders were entitled to a cumulative dividend of 40% on shares with a nominal value of £2.50 (that is, £1), to be paid before any dividends were paid to deferred holders. Equity values had recovered somewhat by 1913. By then debentures (by market value), accounted for only 4.4% of the total market value of the company, preference shares for 37.0% and equities for 58.6%..

† The current dividend yield of 5.19% was calculated as follows. In June 1913, the market value of ordinary shares, fully paid and therefore eligible for a full dividend, was £10.7m. At the same time, some 600,000 new shares, issued in January 1913, were also outstanding. These shares were only partially paid, and did not qualify for any dividend. This was because the new shares were issued at £3, of which £2 was a premium on the £1 nominal value. Only £0.60 had been paid upon subscription and allocation, the rest being due in annual instalments of £0.60, beginning in January 1914 and ending in January 1917. Hence in June 1913, none of the nominal value of the newly issued shares, upon which dividends were declared, had been paid – the £0.60 paid was considered a payment of the premium only - and therefore no dividends were due on them. Although the new partially-paid shares were not quoted by the *IMM*, presumably because they were not publicly traded in sufficiently large volume to warrant inclusion, we have imputed a value to them. Since the newly issued shares would be identical to fully paid shares (including dividend rights) upon payment of the remaining £2.40 due, we have assumed their value was equal to that of fully paid shares, less the £2.40 still outstanding in June 1913. This procedure imputed a value of $2.30 to each partially-paid share, or £1.4m in total, which, when added to the market value of the outstanding fully-paid shares, amounted to a total market ., as reported in Table 13. Note that the imputation serves to lower the reported dividend yield. Had the dividend yield been calculated upon the market value only of the fully-paid shares eligible for a dividend (£10.7m.), the yield would have been 5.86%. Had the partially-paid shares been valued at only the amount actually paid up as of June 1913 (£0.60), the current dividend yield would have been 5.65%. It should also be noted that the newly issued shares of January 1913, like previous secondary issues made by Brunner, Mond, were offered only to existing ordinary shareholders on a pro-rata basis. Over the six-month period when the new issue was announced and carried out, Brunner’s share price fluctuated in the region of £4.50-£5.00. Taking up the new issue therefore afforded the investor an immediate capital gain of some £1.50-£2.00 on each £3 share obtained. Only if the deeply discounted rights issue had backfired on the company, and the company’s share price had collapsed (which it most certainly did not) upon announcement of the new issue, would the imputed capital gain have disappeared.

(1). Unusually for a mine, Rio Tinto was highly geared at an early stage, with outstanding debentures with a market value of £2.032m. in 1878, over twice the value of its outstanding equity.

(2) Gearing by market capitalization, 26%.

(3) Gearing by market capitalization, 37%. After 1888, Rio Tinto’s gearing fell and remained below 30% for the rest of the period.

TABLE 14

MINING: APPROXIMATE OUT-TURN OF TOTAL RETURN, 1868-1913*

		COL. (1)		COL.(2)		COL.(3)	
		Average Annual Dividend Growth	Average Annual Dividend Growth	Average Annual Capital Apprec.	Average Annual Capital Apprec.	Total Return (1)+(2)= (3)	Total Return (1)+(2)= (3)
1a. 1873-78 (Tharsis only)		6.05 %		-9.07 %		-3.45 %	
1b. 1878-83 (3 firms)*		27.12 %		13.41 %		40.53 %	
2. 1883-98							
.	2.1 Same firms as in 1b Basis: 1883 £13.6m		-0.72 %		0.28 %		-0.44
	2.2 New-comers. Basis: 1898 paid-up, £21.8m		9.06 %		8.91 %		17.97%
	2.3 Average of (2.1) and (2.2)**		6.94 %		6.60 %		13.53 %

* Tharsis Copper & Sulphur, Rio Tinto, and Mason & Barry Coal Mine

[Cont.]

TABLE 14 [Cont.]

MINING: APPROXIMATE OUT-TURN OF TOTAL RETURN, 1868-1913*

		COL. (1)		COL.(2)		COL.(3)	
		Average Annual Dividend Growth	Average Annual Dividend Growth	Average Annual Capital Apprec.	Average Annual Capital Apprec.	Total Return (1)+(2)= (3)	Total Return (1)+(2)= (3)
1898-1913							
	3.1 1898 listed (inc. dropouts). Basis 1898: £95.2m. Cap. 1913 £113.7m		4.03 %		1.19 %		5.22 %
	3.2 16 new entrants still listed in 1913. Basis: 1913 paid up: £20.7m. 1913 cap: £65.7m.		9.45 %		7.55 %		17.00 %
	3.3 11 new entrants <u>not</u> still ranked in 1913 Basis: 1903 cap: £33,466 See text.		? almost certainly negative		-3.49 %		-3.49 % or less
	Average of (3.1) and (3.2) Basis: average of 1898 and 1913 bases. See text.		5.56 %		2.99%		8.55 %

<u>END TABLE 14</u>

TABLE 15

MINING: ESTIMATE OF RISK PREMIUM, 1873-1913

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June) [yield to maturity]	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
1a. 1873-1878 Perfect Fore-sight (Tharsis only)	3.48%	3.69%	6.05% (Source: Table 13)	3.25% (June 1873)	4.70% (1873)	6.49%	5.04%
1b. 1878-1883 Extrapol. (3 companies See text.)	9.77%	10.36%	6.05% (Source: Table 13)	3.13% (June 1878)	3.59% (1878)	13.28%	12.82%
1b. 1878-1883 Perfect Foresight (3 companies See text.)	9.77%	12.42%	27.12% (Source: Table 13)	3.13% (June 1878)	3.59% (1878)	36.41%	35.95%
2.1 1883-1898 Extrapol. (Same companies as 1b.)	7.40%	9.41%	27.12% (Source: Line 1b. above)	2.84% (June 1883)	3.22% (1883)	33.69%	33.31%
2.1 1883-1898 Perfect Foresight. (Same companies as 1b.)	7.40%	7.35%	-0.72%	2.84% (June 1883)	3.22% (1883)	3.79%	3.41%
2.2 1883-1898 Extrapol. New-comers to top Ranking	8.28%	10.53%	27.12%	2.84% (June 1883)	3.22% (1883)	34.81%	34.43%
2.2 1883-1898 Perfect Foresight. New-comers to top Ranking	8.28%	9.30%	9.06% (Source: Table 13	2.84% (June 1883)	3.22% (1883)	15.52%	15.14%
2.3 1883-1898 Average of (2.1) and (2.2) Extrapol.	8.09%	10.28%	27.12%	2.84% (June 1883)	3.22% (1883)	34.56%	34.18%
2.3 1883-1898 Average of (2.1) and (2.2) Perfect Foresight	8.09%	8.65%	6.94%	2.84% (June 1883)	3.22% (1883)	12.75%	12.37%

[Table 15 Continued]

TABLE 15 [Continued]

MINING: ESTIMATE OF RISK PREMIUM, 1873-1913

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June) [yield to maturity]	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
3.1 1898-1913 Extrapol. For 1898 Incumbents	5.47%	5.85%	6.94% (Source: Line 2.3, perfect foresight.)	2.29 % (June 1898)	2.62% (1898)	10.50%	10.17%
3.1 1898-1913 Perfect Fore-sight for1898 incumbents	5.47%	5.69%	4.03%	2.29 % (June 1898)	2.62% (1898)	7.43%	7.10%
3.2 1898-1913 Extrapol. New-comers still listed in 1913	6.33%	6.90%	9.06% (Source: Table 13, Line 2.2, Col [1])	2.29 % (June 1898)	2.62% (1898)	13.67%	13.34%
3.2 1898-1913 Perfect Fore-Sight for New-comers still listed in 1913.	6.33%	6.93%	9.45% (Source: Table 13, Line 3.1, Col [1])	2.29 % (June 1898)	2.62% (1898)	14.09%	13.76%
3.3 1898-1913 Extrapol. New-comers not still listed in 1913	4.75%	5.18%	9.06%	2.29 % (June 1898)	2.62% (1898)	11.95%	11.62%
3.3 1898-1913 Perfect Fore-Sight for New-comers not still listed in 1913.	4.75%	4.58%	-3.49%	2.29 % (June 1898)	2.62% (1898)	-1.20%	-1.53%
3.4 1898-1913 Average of (3.1) and (3.2) Extrapol.	5.71%	6.14%	7.52%	2.29 % (June 1898)	2.62% (1898)	11.37%	11.04%
3.4 1898-1913 Average of (3.1) and (3.2) Perfect Foresight	5.71%	6.03%	5.56%	2.29 % (June 1898)	2.62% (1898)	9.30%	8.97%

[Table 15 Continued]

TABLE 15 [Continued]

MINING: ESTIMATE OF RISK PREMIUM, 1873-1913

	$\frac{D_0}{P_0}$	$\frac{D_1}{P_0}$	g_0	Consol (end-June) [yield to maturity]	Money Market (yearly average)	$(rp)_0$ Consol	$(rp)_0$ Money Market
4. 1913 Incumbents of 1913 ranking only. Extrapolation	8.68%	9.12%	5.56% (Source: Table 13, Line 3.4, Col [1])	3.45% (June 1913)	4.36% (1913)	11.23%	10.32%
					Average (18 observations)	15.53%	15.08%

END TABLE 15

Figure 1a: Brunner, Mond Limited
Called cash amounts, all equity issued (including for non-cash consideration), dividends and market values.

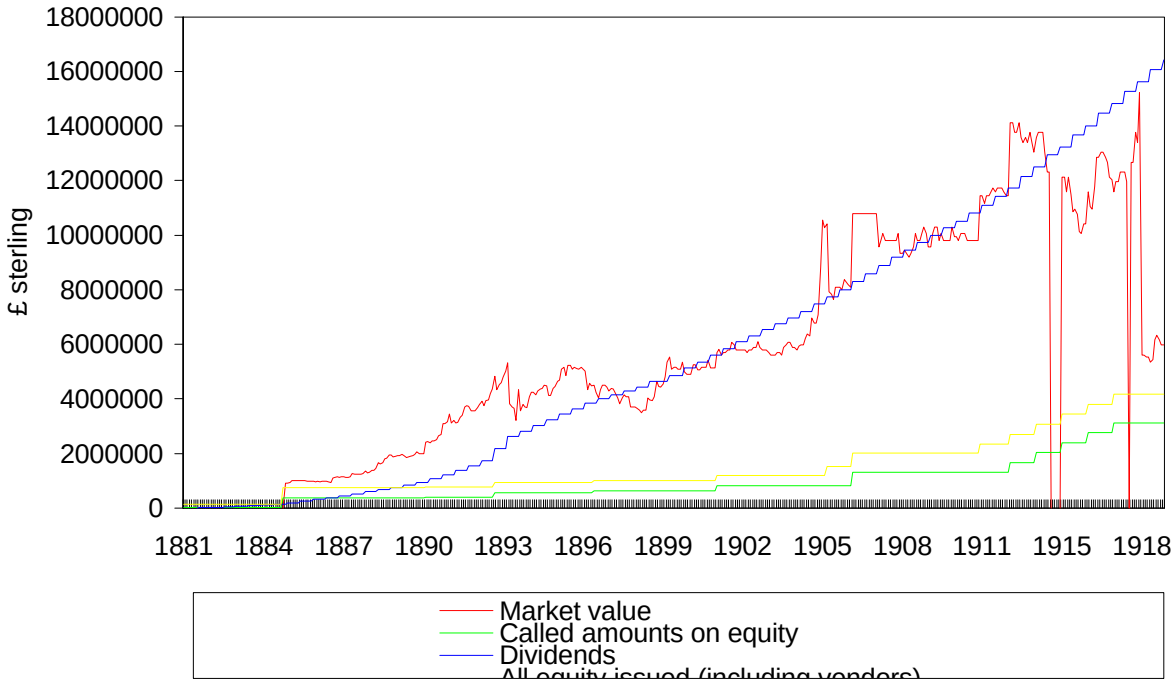


Figure 1b: Brunner, Mond Limited
Valuation ratios discounted at 6% per annum.

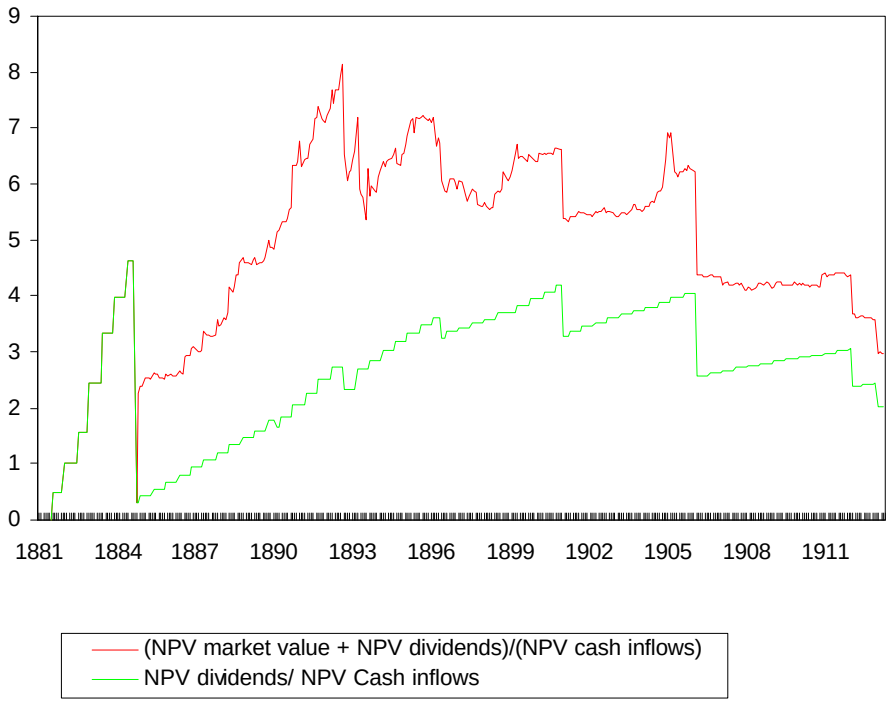


Figure 2a: London and North-Western Railway
Called cash amounts, all equity issued (including for non-cash consideration), dividends and market values.

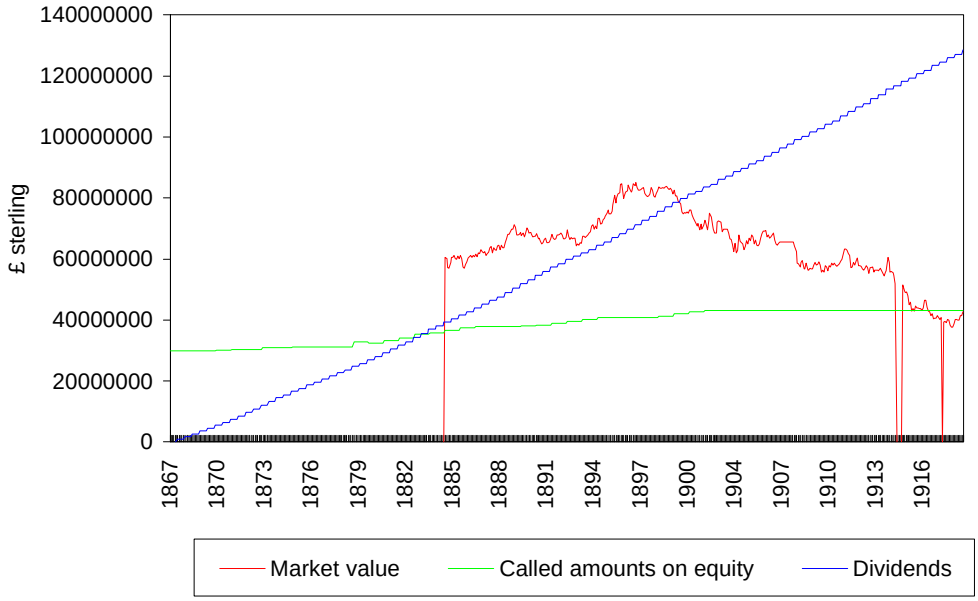
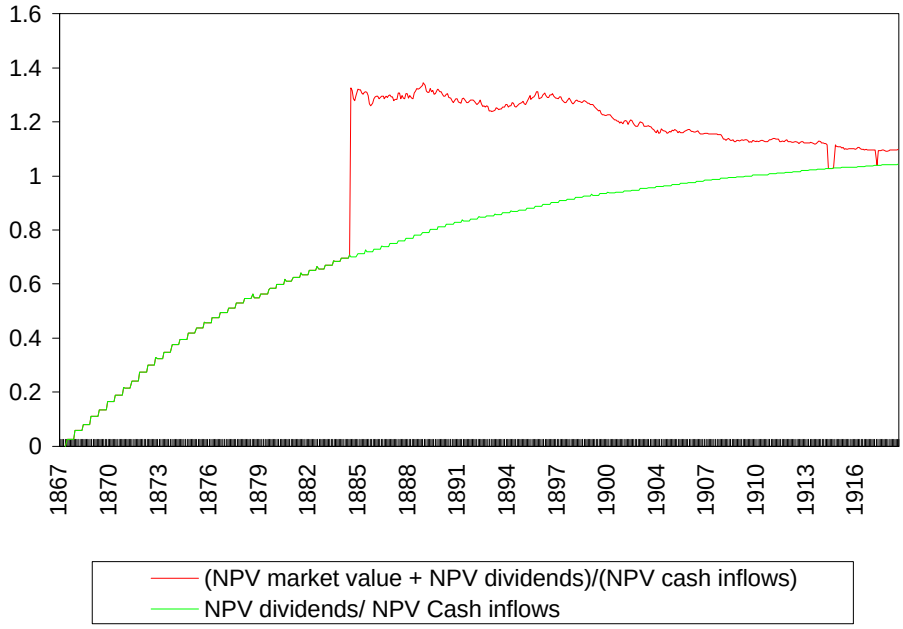


Figure 2b: London and North-Western Railway
Valuation ratios discounted at 6% per annum.



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