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## SHARES IN SOUTH-WEST MINES AS PORTFOLIO INVESTMENTS, 1861-92

by

Norikazu Kudo

### Abstract

Estimating rates of return on British overseas investments is a popular topic among recent studies on the effects of capital exports on British industrial performance since the last quarter of the 19th century. Until shares in foreign mines became attractive assets in the London capital market, domestic investments dominated, yet there are virtually no calculations on them. Based on reconstructed cash flow data collected from the *Mining Journal*, estimations on portfolio investment will be made using the concept of the Internal Rates of Return (IRR). They will be calculated for major Devon and Cornwall mines between 1861 and 1892 to speculate about the following arguments; that firstly, the south-west mines, except for a few, were not considered as desirable financial assets because of their short lives and extreme fluctuations in financial performance, and secondly, that on the other hand, the fluctuations themselves created opportunities for making immediate profits by sharedealing. As such, they were very attractive as objects for speculation. There may have been two kinds of investors: those who were shareholders of a small number of celebrated mines which were continuously lucrative in terms of both dividends and high evaluation in the share market, and those who were seeking quick capital gains from sharedealing and were more interested in the market price of the shares than the mining activity itself. An analysis of the ways in which developments in the share market were reflected on the conservative attitudes in mine management in the south-west of England will be required.

### Key Words

rates of return, ~~internal rates of return, portfolio investments,~~  
non-ferrous metal mining, the south-west of England, foreign mines,  
London capital market, late 19th century.

Numerous books and articles on the massive capital export, according to Edelstein the “uniquely high outflow of British savings for four decades”,<sup>1</sup> have been published until now, as part of the never-ending search for the causes of the relatively poor industrial performance in Britain since the last quarter of the 19th century. Though various aspects of this capital export have been brought to light, the fundamental questions have yet to be answered : why did such a large volume of foreign investment take place ; and did it consequently hinder the British industrial development? Even an attempt to survey the relevant debates has drawn new criticism.<sup>2</sup> However, two distinct tendencies can be seen in recent articles.

The first is that particular effort has been made to examine the characteristics of the London capital market and business organisations that facilitated the outflow of capital : Chapman’s discovery of investment networks, Michie’s work on venture capital on the London Stock Exchange, and Wilkins’ study of “free-standing companies” are notable among them.<sup>3</sup>

The other is that, instead of discussing capital export on the basis of aggregated figures, more attention has been paid to its component features such as geographical or industrial distributions.<sup>4</sup> Recent series of articles on British investment in overseas mining are products of this tendency. Harvey and Taylor, by analysing financial data of companies which were involved in Spanish mining between 1851 and 1913, carefully examined a widely held view that the British investment in Spanish mines was very lucrative, and thus

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1. Edelstein, *Overseas Investment*, p. 3.

2. Pollard, “Capital exports”, do., “Comments” and Temin, “Capital exports”.

3. Chapman, “Investment groups”, Michie, *The London*, do., “The stock exchange” and Wilkins, “The free-standing company”.

4. Davis and Huttenback, *Mammon*, Chapt. 2 and 3.

caused Spain the loss of capital which was needed for the development of domestic industries, by outflow of profits to Britain.<sup>5</sup>

Harvey, with Press, produced two other suggestive papers: one on the relationship between investment in overseas mining and the activities of British mining engineers, which established London as the centre of international mining,<sup>6</sup> the other on the links between the City and international mining which, together with Van Helten's work, enables us to gain a comprehensive view of the world-wide mining activities through the London capital market.<sup>7</sup>

Along with these studies, current interest in the profitability of capital exports is considerable, especially in the rates of return on capital which was invested abroad through the London capital market. In the early 1980's, Edelstein, and later Davis and Huttenback, attempted to compare the rates of return on overseas investment with those on domestic investment.<sup>8</sup> Although the rates of return that are quoted in their books are convenient for making comparisons between countries or industries, they are inadequate for examining the factors that influenced the decision-making of investors in the capital markets. To some extent, the evaluation of proposed portfolio investment may have been made on the basis of the expected long term rates of return, instead of on the yields of shares or bonds at a certain point in time. This expected rate of return can be estimated by the Internal Rate of Return (IRR), the compound discount rate that reduces the sum of a series of net cash flows to zero.<sup>9</sup>

It was in Frankel's study of investment in South African mining that the IRR was first and extensively used to measure the performance of British capital invested abroad. He found the mean IRR to be 5.2% between 1887 and 1965, despite many failures of mining projects.<sup>10</sup> His idea has been

5. Harvey and Taylor, "Mineral wealth".

6. Harvey and Press, "Overseas investment".

7. Harvey and Press, "The City" and Van Helten, "Mining".

8. Edelstein, *Overseas Investment*, Chapt. 5 and 6. Davis and Huttenback, *Mammon*, Chapt. 3.

9. For the definition and the method of calculation of the IRR, see Frankel, *Investment*, p. 37, Solomon, "Alternative rate", pp. 67-68, and Harvey and Taylor, "Computer modelling", pp. 118-130.

10. Frankel, *Investment*, p. 27.

developed and refined by Harvey and Taylor in their study of British investment in Spanish copper, lead and iron mines, which revealed the performance of 123 British mining companies between 1851 and 1913 to be equivalent to an IRR of 10%.<sup>11</sup>

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As Burt pointed out in a pioneering study of the mining exchange,<sup>12</sup> various attempts were made towards the end of the 19th century to establish a special market for the trading of mining shares in London. These attempts were generally unsuccessful, but they lead to a considerable volume of mining shares being traded in London. Also, mining expertise — mining promoters, engineers and so on — accumulated in London to the point where “mining overseas was but a further extension of their field of vision”.<sup>13</sup> Before it became a centre for international mining, London had already established itself at the hub of a national mining industry that had been a leading player in the world mining scene until the third quarter of the 19th century.<sup>14</sup>

Nevertheless, few attempts have been made to calculate the profitability of domestic mining when considered as a portfolio investment. As mentioned above, the ratio of dividends to nominal paid-up shares, which has often been discussed in this context, is inadequate.<sup>15</sup> Since the market price of domestic mining shares can be found in the share lists of the *Mining Journal* (hereinafter abbreviated to *MJ*), published every Saturday, it is possible to reconstruct approximate cash flows into or out of mines, and so we can attempt to estimate an IRR on domestic mining investment. Regardless of whether the same group of people shifted their investment funds from domestic mining to overseas mining as the years progressed — an unlikely scenario<sup>16</sup> — it is still worth investigating the rates of return on portfolio investment in domestic mines, notably non-ferrous metal mines in Devon and Cornwall, which had dominated the mining share lists before foreign mines became prevalent in the 1890s, to compare them with those on overseas investment and, possibly, contemporary interest rates.

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11. Harvey and Taylor, “Mineral wealth”, pp. 197–200.

12. Burt, “Mining exchange”.

13. Harvey and Press, “The City”, p. 109.

14. For production figures, see Schmitz, *World Non-Ferrous Metal*.

15. e.g., Morrison, *Cornwall's Central Mines*.

16. Burt, “The same or an entirely new set”.

I shall first discuss some features of the south-west metal mines appearing in the share lists. Then, relying heavily on the ideas and methods developed by Frankel, Harvey and Taylor, an IRR will be estimated for some major mines whose financial data are available from the *MJ*. The assumptions that are necessary to estimate the IRR are severe, and not necessarily justifiable. But by examining the profitability of these mines from a novel viewpoint, I hope to illustrate some of the factors that may have influenced investment decisions during this period.

## I

Most of the non-ferrous metal mines in Devon and Cornwall in the 19th century were organised as cost book companies. Although this type of business organisation was found in other parts of the country — and abroad — it originally developed under the jurisdiction of the Stannary Courts. It was an extended partnership under Common Law with freely transferable shares. This meant that the shareholders must have borne unlimited liability in legal terms but were virtually able to escape from this by selling their shares whenever they wanted.<sup>17</sup> The number of companies on the principle of limited liability was gradually increasing after the Limited Liability Act 1856, but their influence was not as remarkable as has previously been thought: especially for the major productive mines in the south-west of England, the cost book system remained the dominant form of company organisation. For instance, out of sixteen dividend paying mines in Devon and Cornwall, only one was a limited joint stock company in 1881<sup>18</sup>: in 1886, there were no limited liability companies paying dividends in this area.<sup>19</sup> It was mainly the shares of cost book companies that were traded in London until the early 1890s, when a drastic reorganisation of mining companies in this region began to take place.

As I have shown in another article, it is very difficult to assess the amount of capital actually employed in mineral production, partly due to the

17. For a legal aspect of the cost book system, see Pennington, *Stannary Law*, for a discussion on economic aspects, see Burke and Richardson, "The decline and fall" and Burt and Kudo, "The adaptability". Also refer to Tapping, "The cost book" and "The principles".
18. E. Ashmead, "Particulars of British metalliferous mines", *MJ* 18 February, 1882, p. 186.
19. "The mining share list", *MJ* 1 January 1887, p. 19.

characteristics of the mining industry itself and partly due to the accounting procedures peculiar to the cost book system.<sup>20</sup> However, if we consider the domestic mines as the objects of portfolio investment, there is a useful information source. : from its inception under the editorship of Henry English in 1835, the *MJ* published a wide variety of information on mining companies — prospects for ore discovery, the current state of production and resolutions of shareholders' meetings where dividends were declared or calls were made. Especially important is the "Mining Share List", which usually appeared on the last page of each issue and supplied investors with the latest share prices of mines traded in London, regardless of location — domestic or overseas — or form of business organisation — cost book or limited liability.

However useful it may be, the information gained from the *MJ* has many defects and limitations. These derive partly from the nature of the articles: many were not based on original information gathered by the staff but were supplied from indirect sources and compiled by the editor.<sup>21</sup> It seems probable that there were errors and inconsistencies. For example, only the amount of dividends and call of mines could be found from the columns of company meetings in the early 1880s, although ample other data on the financial situation of mines were available in the preceding and following years. Misleading or distorted information often appeared in an attempt to manipulate investors on the London share market.<sup>22</sup> Even in the share lists, errors in the amount of paid-up capital, declared dividends, the number of paid-up shares and so on are found without difficulty. The market prices of shares were not always given in the lists, either due to simple lack of information, or to the recurrent low volume of trading for several weeks : the mines that consistently produced good ore were so popular that no-one wanted to sell their shares, even at highly inflated prices.<sup>23</sup> In addition, we have no means of confirming whether actual transactions were made at the price quoted on the list.

Notwithstanding these defects, the *MJ*, especially the share list, is the most

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20. Burt and Kudo, "The adaptability", pp. 36-40.

21. Sometimes articles were reprinted from the local press like *West Briton*.

22. Morrison, *Cornwall's Central Mines : The Northern District*, p. 41, Burt, "Mining exchange", p. 129.

23. e. g., According to *MJ* 10 January, 1863, the price of a single share in Dolcoath mine was £605 but there was no business report.

comprehensive and abundant information source. If supplemented by other sources, e.g., *Mineral Statistics* for information on production and ownership and the *Stock Exchange Yearbook* from 1875 for an outline of the financial situation of the company, we can reconstruct approximate cash flows into or out of domestic mines through the share market. To do this, we need an assumption that may be highly unrealistic — that the *MJ* share list was the only information source available to investors and, therefore, all transactions of mining shares were exclusively made at the list prices either in London or local markets.

In order to avoid further inconsistency in the data, the period of observation shall be confined to 1861-92. 1861 saw more transactions of shares than previously, and so the information that appeared in the *MJ* became more comprehensive<sup>24</sup>: 1892 was the year immediately before the collapse in the price of tin, which led to the massive reorganisation of the mining companies of the south-west of England.<sup>25</sup>

There is still a certain amount of ambiguity. The criteria used to quote mines in the lists, and to classify them into such groups as “dividend mines”, “non-dividend mines” or “progressive mines”, are not known. It is obvious that mines that had paid dividends for several years tended to stay in the same category of the lists for some years even after they ceased paying out: the duration of remaining in a category differs from case to case. We cannot go further because we cannot examine the criteria for classification: however, these classifications are not essential in tracing the cash flows of mines, although they give us some indication about dividends and calls.

Before we proceed to the discussion of rates of return on investments, it is useful to glance at the characteristics of the south-west mines in the share lists. The number of Devon and Cornwall mines appearing in the share lists of the second issue of the *MJ* (the issue published on the second Saturday of

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24. Burt, “Mining exchange”, pp. 124-125, p. 137.

25. In February 1892 South Wheal Frances and West Wheal Basset formed South Frances United which, with Wheal Basset, eventually became Bassett Mines Ltd. in 1895. In the same year Dolcoath mine converted to limited liability status. In 1896 Carn Brea, Tincroft and Cook’s Kitchen amalgamated, and in 1897 East Pool merged with Wheal Agar to form East Pool and Agar.



January each year) throughout the study period are shown in Table 1. The numbers of mines from the remainder of the British Isles (including Ireland and the Isle of Man) are also given for comparison. It can be seen that the total number of listed British mines dropped dramatically during the study period. Among them the decrease in the number of Devon and Cornwall mines is striking: more than 300 mines in Devon and Cornwall disappeared completely from the lists between 1861 and 1891.

If we employ the *MJ*'s classification as a rough indicator of the financial position of mines, there was a notable fall in the number of Devon and Cornwall "dividend mines" between 1871 and 1891: this possibly represents a general deterioration of profitability which began from the 1870s in this region. The slight increase in the number of "dividend mines" in other regions between 1871 and 1881, followed by the precipitous drop between 1881 and 1891 may be indicative of the later onset of profitability problems outside the south-west. The loss of more than half of the Devon and Cornwall "non-dividend mines" from the lists between 1861 and 1871 probably reflects the collapse in copper mining in the region during this period. In most years, Devon and Cornwall mines accounted for 70 % of the domestic mines quoted in the list, reflecting their overwhelming share of production of non-ferrous metals. Conversely, there was a remarkable increase in the number of foreign mines quoted in the lists over the study period.<sup>26</sup>

Tables 2-a to 2-d give a general idea of the longevity, size and performance of Devon and Cornwall mines. The longevity of the mines was estimated by counting the number of years of successive appearance in the *MJ* (based on appearance in the second issue of the year). Reappearance of a mine under the same name after a period of absence was taken to indicate the formation of a new company. Amalgamations were treated case by case, using *Mineral Statistics* to obtain necessary information on continuity (or otherwise) of production, ownership and management. The size of mines is estimated by considering the number of shares and the amount of paid-up capital at the date of the last appearance in the share lists. The overall performance of mines was estimated by subtracting the total cumulative sum of paid-up capital from the cumulative sum of dividends paid at the date of the

26. Excluding those classified as iron and coal companies, there were 80 mines in the list of *MJ* 8 January 1881, but this figure increased to 338 in the list of *MJ* 10 January 1891.

last appearance of the mine in the lists.

Table 2-a give figures for those mines that appeared in the list of 1861 but not in the list of 1892. Tables 2-b and 2-c give figures for mines appearing in the lists of 1871 and 1881 respectively, but not in the list of 1892. Table 2-d give figures for the twenty-two mines that remained on the lists continuously from 1861 to 1892. These tables are far from being perfect due to the lack of consistently available information. This can be seen in the discrepancies in the numbers of mines between Table 1 and the corresponding part of Table 2s : 358 Devon and Cornwall mines are recorded in the Table 1 but only 354 mines in total are observed in Table 2s. We must also be aware that these figures may not correspond with reality, as mines may well have existed before the commencement of quotation and survived after deletion. Above all, these tables are only meaningful if we assume that all investors made their decisions based solely on the *MJ* share list.

The following points may noted from Table 2. Firstly, the south-west mines were generally short-lived as investable assets to the public. Most disappeared from the lists within a few years of arrival and with poor financial results, although this did not necessarily indicate the closure of the mine. Secondly, a steady increase in the number of shares, with a consequent decrease in the capital required per share, is clearly observable. This suggests a clear move towards the subdivision of shares for existing companies and the multiplication of shares for newly formed or re-organised companies, possibly to make their shares more accessible to the public. Thirdly, despite this tendency, there was no clear trend towards larger companies over the study period, judging by the total amount of paid-up capital. Finally, as might be expected, the figures for the twenty-two long-lived mines in Table 2-d are in sharp contrast to those of other mines. With relatively small number of shares, most of them paid dividends that were more than enough to compensate shareholders for their nominal outlay. As financial assets, the shares of those mining companies appear to have been much safer and more lucrative than those of other companies. But the supposed investors here may have found it difficult to acquire these shares as no one would sell them at accessible prices. Prices of those shares must have gone up when the mines were making or expecting profits. Therefore, instead of comparing declared dividends with nominal paid-up capital, we should compare dividends with the market value of the shares if we intend to treat them as potential portfolio

investments : we must consider "the market problem", which was discussed by Davis and Huttenback.<sup>27</sup> As a part of this effort, the rates of return on capital invested in the shares of these major mining companies will be examined below.

## II

In calculating the rates of return, it is necessary to reconstruct possible or supposed cash flows between investors and individual mining companies for the period between 1861 and 1891. Cash flows of this kind are traceable, with some imperfections, for eleven out of the twenty-two major mines in Table 2-d : Dolcoath, East Pool, Carn Brea, Tincroft, Wheal Grenville, South Con-durrow, Cook's Kitchen, Wheal Kitty, South Wheal Frances, West Wheal Basset and West Wheal Seton. These mines are all in the list of principal producers compiled by Burt et al.<sup>28</sup> : in terms of production, the first four were the largest in Cornwall.

For the remainder of the mines in Table 2-d, it is possible to collect data on paid-up calls and declared dividends over a relatively long period, but there are difficulties in fully reconstructing cash flows. For example, Devon Great Consolidated Mines, once Europe's largest copper producer, converted itself into a limited liability company in 1872<sup>29</sup> : this made it difficult to trace the cash flows without a break. Wheal Basset experienced virtually no production around 1880, and some re-arrangements of the company took place accordingly. Wheal Owles, Levant and Bottalack were profitable for some years of the study period, but share price data are not always available from the share lists, possibly because of the low volume of trading. In this sense, these mines were "closed" to the public, although their name continued to appear on the lists.<sup>30</sup> Other mines, such as South Wheal Crofty, Wheal Agar and Wheal Uny, were apparently loss making mines for most of the period, and there seems to be little point in calculating rates of return.

Borrowing the concept developed by Frankel, Harvey and Taylor, and

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27. Davis and Huttenback, *Mammon*, pp. 78-81.

28. Burt, Wait and Burnley, *Cornish Mines*, p. li.

29. For details, see Goodridge, "Devon Great Consols".

30. e. g., The price of the share of Wheal Owles was not available from *MJ* during 1884-1892.

based on these cash flow data, the IRR on investments in each mine was calculated. This assumes that potential investors made their decision based on the IRR that had been realised on previous investments, i. e., the IRR served as an estimator for the expected rate of return on an investment. For example, if investors obtained an 8% rate of return annually from the previous investment over a period of time, they would see this as a baseline for considering the future investment in the same mining shares. Of course, as the mining share market was extremely speculative in its nature due to the unforeseeable mining operation, the previous returns may have little influence in investors' minds ; but its influence cannot be completely refuted.

In order to estimate an IRR, the following assumptions are necessary :

- i) The initial investment would be made by buying the company's whole shares at the average share price at the end of the first year<sup>31</sup> ;
- ii) The investor would receive all dividends and capital repayment (if made), would pay all calls required, and would subscribe to all newly issued shares of the company at the market value until the end of the final year ;
- iii) The investor would dispose of all the shares held at the end of the terminal year at the average share price for that year.

On the basis of these assumptions, three IRRs were calculated. The first is an IRR for a ten-year investment, calculated for each year of the study period. Additionally, an IRR was calculated for a ten-year investment assuming, contrary to the third assumption above, that the resale value at the end of the period was zero ; the investor would continue to hold the shares and there would be no realised capital gain at the end of the period. The results for the above mentioned eleven south-west mines are given in Table 3 : the results for four mines from other regions are given for comparison. Finally, an IRR was calculated for the various periods ending in 1892 (i. e., 1861-1892, 1862-1892 ... 1882-1892) : this enables us to compare the returns received by long-term shareholders with those received by shorter-term

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31. This was taken to be the average of the share prices for the second issues of January, March and October : this method minimises the seasonal effect of dividends and calls on the share price. Where a share price was not quoted in the requisite issue of *MJ*, the price quoted in the nearest available issue was used.

holders. Table 4 shows the results for those mines that showed significant returns.

### III

It can be seen from Table 3 that there is a wide variety in the performance of the various mines in the study group. Among the top mines, Dolcoath and East Pool realised very high rates of return throughout most of the ten-year periods considered, although their shares were undoubtedly difficult to acquire because of their extremely high market prices. Reflecting their geographical proximity and almost common management, the IRRs for Carn Brea and Tincroft show similar trends ; mainly positive until 1880, when they suddenly deteriorated and remained negative for several years until 1889, when a slight recovery can be seen. South Condurrow consistently brought good returns throughout the study period, when neighbouring Grenville became a profitable asset after 1885. The IRR for Wheal Kitty showed contrasting behaviour : consistently high before 1880 but mostly negative after that date. The lucrative returns shown by South Wheal Frances between 1879 and 1888 are a reflection of its low market value during the 1870s. IRRs for Cook's Kitchen and Wheal Basset were negative for most of the study period, with only exceptional positive results. West Wheal Seton was a copper mine whose shares suffered a serious setback after the collapse of copper mining in the region : this led to a negative IRR for most of the early portion of the study.

By way of comparison, IRRs were calculated on the same basis for Minera Mine (Denbighshire), Great Laxey (Isle of Man), Van Mining (Montgomeryshire) and Leadhills (Lanarkshire). All of these mines were joint stock companies organised on the principle of limited liability. Among these, Great Laxey and Minera are particularly comparable with the Cornish mines, as they stayed in the lists throughout almost the entire study period. Great Laxey's IRR was generally steady but modest : for the others, results were unremarkable.

From the above Devon and Cornwall mines, we may consider that shares in Dolcoath, East Pool and probably South Condurrow were relatively good ten-year investments. Among the remainder, Carn Brea, Tincroft, Wheal Grenville, Wheal Kitty were also good assets, depending on the time of acquisition.

Table 4 shows the IRR for all the study period ending in 1892 for the six Cornish mines and two others for which significant results were obtainable. It can be seen that shareholders in Dolcoath, East Pool and South Condurrow, both long-term and short-term, were likely to be content with their earnings. For example, East Pool and Dolcoath brought respective returns equivalent to 13.1 % and 9.8 % annually for investors who bought in 1861 and sold in 1892: the same mines brought respective returns equivalent to 6.6 % and 10.2 % annually to shareholders who bought in 1881 and sold in 1892.

The estimated IRRs vary tremendously with the market value of the shares, both at the time of purchase and sales. As expected, this tendency becomes more apprent as the holding period becomes shorter. As can be seen in Figures 1 and 2, the market value of even the largest of the mines fluctuated markedly with dividends, profitability and prospects. The IRRs calculated on the basis of a zero redemption value after ten years (Table 3, figures in parentheses) show a very different trend. Even Dolcoath only managed to realise positive returns for eight of the twenty-two periods examined. South Condurrow, Grenville and particularly East Pool only realised good returns in the 1880s, in sharp contrast to Kitty and Tincroft, whose performance was better in the earlier years of the study period. Most mines only exceptionally recorded positive rates of return on this basis.

Therefore, it is the fluctuation of the market value of the shares, i. e., market prices, which appears to be the more important factor in determining the profitability of investments, rather than the level of dividends. In other words, investors earned more from dealing shares than from receiving dividends, even for the top ranked mines. However, it should be remembered that the market price of the shares was often closely linked to the dividend level.

#### IV

More work will be needed to examine the overall profitability of investments in south-west mining as a portfolio investment. Even on our assumptions, total cash flows into and out of all south-west mines quoted on the share lists would be required, as Harvey and Taylor did for British investments in Spanish mines. But, as we saw in the earlier part of this essay, there were more than 300 Devon and Cornwall mines in the *MJ* share lists in

the 1860s, with frequent drop-outs and newcomers after that date. To trace all of their cash flows would be tremendously time consuming. In this study we confined our analysis to a smaller and more manageable number, fifteen mines including eleven from Devon and Cornwall.

Even so, one or two features are apparent from this study. Firstly, the south-west mines generally had a short life as financial assets. Only twenty-two mines remained in the *MJ* share list throughout the study period. Secondly, even among these mines there was a great variation in the financial performance : some mines, e. g., Dolcoath, East Pool and South Condurrow, performed well as ten-year investments, whereas, others, e. g., West Wheal Basset and West Wheal Seton, were basically loss-making. Thirdly, in terms of investment potential, there seems to be little difference between the south-west mines and mines in other parts of the British Isles, although returns on the latter mines seemed to fluctuate less.

It can be seen that, in general, the south-west mines were not suitable for long-term investment if the main object of such an investment was to receive dividend income, due to their short life as investable assets. However, there were some exceptions : major mines such as Dolcoath, East Pool, South Condurrow, Wheal Grenville, Carn Brea, Tincroft and Wheal Kitty were good assets to hold for ten years or more, depending on the time of acquisition. Shareholders in these mines from the latter half of the 1860s were still enjoying good returns on realisation in 1892 ; they had reason to be content, even though some of the mines were making a loss in the actual mining activity by the end of this period.

On the other side of the coin, shares in the south-west mines were very attractive as assets for speculation. Even for the twenty-two major mines, there were ample opportunities to obtain capital gains after holding them for ten years or less. Sometimes, dealing in shares brought handsome profits to investors even though the mine itself making a loss : e. g., South Wheal Frances made a call of more than £11000 between 1884 and 1889, but share holders realised a paper return equivalent to an annual 8.46 %. Similarly, Cook's Kitchen showed an IRR equivalent to an annual 6.12 % between 1887 and 1890, although a call of nearly £13000 was made.<sup>32</sup> These examples show

32. All were calculated based on "The mining share list".

the profits that could be made through speculative dealings.

The conservatism in mine development in the south-west mining since the latter half of the 19th century has often been discussed.<sup>33</sup> Conservatism around the beginning of the 1890s may be explained by two kinds of psychological effects of the market on investors. On the one hand, there were shareholders who were content with the contemporary situation: they were shareholders in the few, but very productive, mines like Dolcoath, and also those who held shares from their early days. On the other hand, there were short term shareholders who were thinking about possible capital gains from shareholding: this does not mean that these shareholders actually engaged in speculation, but that they were concentrating on the very real opportunities to make large capital gains from the market. This may have made these shareholders more or less indifferent to the actual operation of the mines. These kinds of psychological effects cannot be ignored. Profits from sharedealing have been discussed by other authors,<sup>34</sup> but more studies on the various other effects of the share market on south-west mining industry will be needed.

The broader question of whether massive overseas mining investment engendered capital starvation of the domestic mines cannot be answered by this study. However, it suggests that in tackling this, investigation into the nature and quality of capital that was invested in mining activities, both at home and abroad, should be as important as the comparison of rates of return.

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Table 1 Number of Devon and Cornwall Mines in the Share Lists of 1861-1891

Year	Listed as Dividend Mines		Listed as Non-Dividend Mines		Total	
	D & C mines	Others	D & C mines	Others	D & C mines	Others
1861	56(74. 7)	19(25. 3)	302(78. 0)	85(22. 0)	358(77. 5)	104(22. 5)
1871	53(73. 6)	19(26. 4)	130(65. 3)	69(34. 7)	183(67. 5)	88(32. 5)
1881	23(50. 0)	23(50. 0)	93(56. 4)	72(43. 6)	116(55. 0)	95(45. 0)
1891	11(61. 1)	7(38. 9)	39(69. 6)	17(30. 4)	50(67. 6)	24(32. 4)

Notes : D & C Mines = Mines in Devon and Cornwall. Others = Other British mines.

Non-Dividend mines for 1861 include the mines listed as "Mines with dividends in abeyance" and "Progressive mines".

Dividend mines for 1891 are classified by the author judging from the payment of dividends in the previous year.

Percentages of each column are given in parentheses.

Source : "The Mining Share List" etc. of each issue of *The Mining Journal*.

Table 2-a Mines in the Share List of 1861

Items	Average	Maximum	Minimum	S. D.
Duration of appearance (years)	6. 47	31	1	5. 83
Number of shares	5, 364. 54	110, 592	25	9, 671. 27
Paid up capital per share	11. 41	190	0. 05	21. 46
Dividends per share	11. 62	749	0	58. 67
Total paid up capital	21, 521. 87	441, 999. 60	51. 20	34, 041. 28
Total dividends	11, 477. 47	383, 488	0	42, 056. 97
Overall performance	- 10, 044. 40	382, 848	- 441, 999. 60	

332 mines are observed. Mines in the list of 1892 are excluded.

Table 2-b Mines in the Share List of 1871

Items	Average	Maximum	Minimum	S. D.
Duration of appearance (years)	4. 48	21	1	4. 12
Number of shares	7, 698. 50	110, 592	236	12, 755. 89
Paid up capital per share	10. 00	105. 25	0. 10	18. 05
Dividends per share	16. 01	749	0	75. 54
Total paid up capital	29, 713. 48	554, 541. 13	500	60, 128. 34
Total dividends	18, 464. 59	383, 488	0	54, 200. 54
Overall performance	-11, 248. 89	382, 848	-554, 541. 13	

155 mines are observed. Mines in the list of 1892 are excluded.

Table 2-c Mines in the Share List of 1881

Items	Average	Maximum	Minimum	S. D.
Duration of appearance (years)	4. 22	11	1	2. 83
Number of shares	14, 673. 29	110, 240	512	17, 352. 82
Paid up capital per share	4. 03	99	0. 25	11. 29
Dividends per share	10. 94	749	0	81. 85
Total paid up capital	22, 955. 46	21, 264	640	20, 595. 61
Total dividends	11, 841. 26	383, 488	0	47, 311. 59
Overall performance	-11, 114. 20	382, 848	-121, 264	

83 mines are observed. Mines in the list of 1892 are excluded.

Table 2—d Mines in the Share Lists throughout the Period 1861–1892

Items	Average	Maximum	Minimum	S. D.
Number of shares	6, 155. 50	12, 000	555	2, 962. 43
Paid up capital per share	14. 89	51. 86	0. 45	13. 23
Dividends per share	38. 14	223. 33	0. 19	51. 70
Total paid up capital	70, 665. 47	254, 126. 25	2, 880	55, 834. 83
Total dividends	179, 406. 11	1, 222, 144	2, 220	267, 494. 27
Overall performance	108, 740. 64	1, 201, 664	– 225, 093. 75	

22 mines are observed.

Notes : Duration of appearance = The period during which each mine appeared in the share lists continuously.

Overall performance = Total dividends — Total paid up capital

Capital and dividends values are given in pound sterling.

All figures are as of the final year of each mine's duration of appearance except for Table 2–d which regards 1892 as the final year.

Source : "Mining Share List" etc. of each issue of *The Mining Journal* 1861–1892.

Table 3 Internal Rates of Return for Periods of 10 Years 1861-71 to 1882-92 (%)

Periods / Mines	Dolcoath	East Pool	Carn Brea	Tincroft	S. Condurrow
1861-71	10.08(N)	12.47(N)	0.80(N)	37.65(25.17)	24.92(N)
1862-72	12.62(N)	17.37( 1.34)	7.93(N)	30.06(17.07)	8.66(N)
1863-73	7.95(N)	4.30(N)	5.47(N)	19.04( 7.36)	12.49(N)
1864-74	—(—)	—(—)	N(N)	14.96( 7.20)	1.77(N)
1865-75	—(—)	—(—)	6.50(N)	17.86(10.90)	2.70(N)
1866-76	16.99( 9.44)	9.95(N)	8.51(N)	22.88(18.34)	6.68(N)
1867-77	19.70(11.69)	12.38(N)	9.63(N)	25.10(21.48)	18.63(N)
1868-78	26.00(20.23)	10.60(N)	3.44(N)	28.04(25.49)	28.44( 8.82)
1869-79	7.74(N)	14.99( 2.18)	17.48(N)	18.94(13.76)	32.65(17.27)
1870-80	11.60(N)	22.42( 4.99)	24.12(N)	4.51(N)	30.40(18.03)
1871-81	8.91(N)	16.47( 1.25)	4.06(N)	N(N)	0.16(N)
1872-82	3.80(N)	16.17( 2.12)	N(N)	N(N)	14.41( 5.26)
1873-83	5.98(N)	22.40(10.78)	N(N)	N(N)	12.58( 3.82)
1874-84	11.66(N)	31.61(22.46)	N(N)	N(N)	25.21(18.09)
1875-85	11.28(N)	23.13(13.62)	N(N)	N(N)	20.63(14.11)
1876-86	19.59( 4.06)	29.81(20.77)	N(N)	N(N)	26.81(20.94)
1877-87	21.24( 5.77)	38.34(32.05)	N(N)	N(N)	17.19( 9.76)
1878-88	27.19(14.73)	50.17(45.83)	N(N)	0.30(N)	11.97( 3.37)
1879-89	25.96(15.30)	39.38(35.02)	6.36(N)	3.70(N)	7.25(N)
1880-90	14.87( 3.03)	11.53( 4.19)	13.83(N)	6.06(N)	5.92(N)
1881-91	8.78(N)	8.20( 1.63)	4.00(N)	3.28(N)	4.86( 0.03)
1882-92	8.45(N)	N(N)	2.03(N)	0.73(N)	4.69(N)

N : Negative including no mathematical roots.

— : Not available due to the lack of information.

Internal rates of return with no terminal value are given in parentheses.

Table 3 Internal Rates of Return for Periods of 10 Years 1861-71 to  
1882-92 (%)

Periods/ Mines	Wheal Kitty	S. Frances	Cook's Kitchen	Grenville	West Basset
1861-71	33. 94(23. 24)	N(N)	3. 06(N)	N(N)	N(N)
1862-72	32. 03(21. 08)	N(N)	4. 84(N)	N(N)	0. 17(N)
1863-73	17. 46( 6. 57)	N(N)	N(N)	N(N)	N(N)
1864-74	10. 40( 3. 38)	N(N)	0. 93(N)	N(N)	N(N)
1865-75	15. 69(11. 07)	N(N)	9. 27(N)	N(N)	N(N)
1866-76	20. 36(17. 73)	N(N)	18. 04(13. 78)	N(N)	N(N)
1867-77	29. 52(27. 38)	N(N)	0. 00(N)	N(N)	N(N)
1868-78	44. 70(43. 66)	N(N)	N(N)	N(N)	N(N)
1869-79	17. 64(15. 87)	7. 27(N)	N(N)	N(N)	N(N)
1870-80	13. 85( 1. 25)	13. 05(N)	N(N)	N(N)	22. 64(N)
1871-81	N(N)	4. 01(N)	N(N)	N(N)	7. 42(N)
1872-82	N(N)	8. 18(N)	N(N)	N(N)	N(N)
1873-83	N(N)	6. 91(N)	N(N)	N(N)	N(N)
1874-84	N(N)	9. 57(N)	N(N)	N(N)	N(N)
1875-85	N(N)	20. 60(N)	N(N)	8. 95(N)	N(N)
1876-86	N(N)	62. 04(10. 12)	7. 28(N)	23. 19( 4. 18)	N(N)
1877-87	N(N)	82. 10(14. 81)	0. 80(N)	29. 40(14. 28)	N(N)
1878-88	0. 33(N)	11. 88(N)	N(N)	32. 50(18. 44)	12. 40(N)
1879-89	N(N)	N(N)	1. 16(N)	26. 62(16. 49)	N(N)
1880-90	N(N)	N(N)	0. 92(N)	14. 63( 2. 91)	N(N)
1881-91	N(N)	N(N)	N(N)	11. 02(N)	N(N)
1882-92	N(N)	—(—)	N(N)	10. 05(N)	N(N)

N : Negative including no mathematical roots.

— : Not available due to the lack of information.

Internal rates of return with no terminal value are given in parentheses.

Table 3 Internal Rates of Return for Periods of 10 Years 1861-71 to 1882-92 (%)

Periods / Mines	West Seton	Minera	Great Laxey	Van Mining	Leadhills
1861-71	1.90(N)	—( 3.86)	—(—)	—(—)	—(—)
1862-72	2.38(N)	11.93(2.65)	—(—)	—(—)	—(—)
1863-73	N(N)	5.38(N)	48.76(44.71)	—(—)	—(—)
1864-74	N(N)	N(N)	8.73(N)	—(—)	—(—)
1865-75	N(N)	—(—)	5.40(N)	—(—)	—(—)
1866-76	N(N)	N(N)	7.80(N)	—(—)	—(—)
1867-77	N(N)	2.65(N)	9.98(N)	—(—)	—(—)
1868-78	N(N)	N(N)	8.55(N)	—(—)	—(—)
1869-79	N(N)	N(N)	5.61(N)	64.22(61.95)	—(—)
1870-80	N(N)	N(N)	7.59(N)	N(N)	—(—)
1871-81	N(N)	—(—)	7.34(N)	N(N)	—(—)
1872-82	N(N)	N(N)	11.19(N)	N(N)	—(—)
1873-83	N(N)	N(N)	8.60(N)	N(N)	—(—)
1874-84	N(N)	N(N)	14.13( 2.14)	N(N)	—(—)
1875-85	N(N)	5.65(N)	7.20(N)	—(—)	—(—)
1876-86	N(N)	N(N)	N(N)	—(—)	N(N)
1877-87	N(N)	N(N)	N(N)	—(—)	N(N)
1878-88	N(N)	N(N)	N(N)	—(—)	1.09(N)
1879-89	N(N)	N(N)	N(N)	—(—)	3.87(N)
1880-90	N(N)	N(N)	N(N)	—(—)	N(N)
1881-91	N(N)	N(N)	N(N)	—(—)	5.80(N)
1882-92	—(—)	N(N)	N(N)	—(—)	—(—)

N : Negative including no mathematical roots.

— : Not available due to the lack of information.

Internal rates of return with no terminal value are given in parentheses.

Calculated from "The Mining Share List" etc. of each issue of *The Mining Journal*.



Table 4 Internal Rates of Return for Various Periods Ending 1892 (%)

Periods	Dolcoath	East Pool	Carn Brea	Tincroft	South Condur- row	Wheal Kitty	Minera	Great Laxey
1861-92	9.77	13.07	0.85	28.73	9.56	27.31	7.15	—
1862-92	8.64	14.60	1.50	18.80	10.77	27.61	5.70	—
1863-92	8.10	9.84	1.39	9.10	11.63	7.85	N	45.43
1864-92	—	—	1.56	8.69	10.75	3.39	N	8.88
1865-92	—	—	4.14	11.62	9.17	11.40	—	5.79
1866-92	16.43	14.53	6.00	18.12	12.67	18.10	N	5.48
1867-92	18.51	18.00	7.42	20.96	17.42	27.70	N	6.24
1868-92	25.13	18.25	6.37	25.55	22.40	43.87	N	5.40
1869-92	12.36	19.36	7.71	15.01	25.22	16.79	N	4.11
1870-92	12.09	18.62	8.99	1.69	23.66	N	N	4.50
1871-92	9.36	13.84	0.87	N	1.50	—	—	4.36
1872-92	5.30	11.17	N	N	12.22	N	N	6.77
1873-92	8.40	17.41	N	N	10.93	N	N	5.01
1874-92	11.80	26.88	3.52	N	21.80	N	N	9.25
1875-92	11.35	18.36	3.17	N	18.63	N	1.97	6.56
1876-92	15.16	23.83	4.99	N	24.58	N	N	1.57
1877-92	15.46	33.64	5.23	N	14.91	N	N	N
1878-92	21.36	46.42	7.42	3.92	8.15	N	N	N
1879-92	22.18	36.14	3.66	3.31	4.62	N	N	1.41
1880-92	13.00	8.62	2.81	N	2.72	N	N	N
1881-92	10.15	6.56	N	N	4.64	N	N	N
1882-92	8.45	N	2.03	0.73	4.69	N	N	N

N : Negative including no mathematical roots.

— : Not available due to the lack of information.

Calculated from "Mining Share List" etc. of each issue of *The Mining Journal*.

Figure1 Fluctuation of Share Prices 1869-92

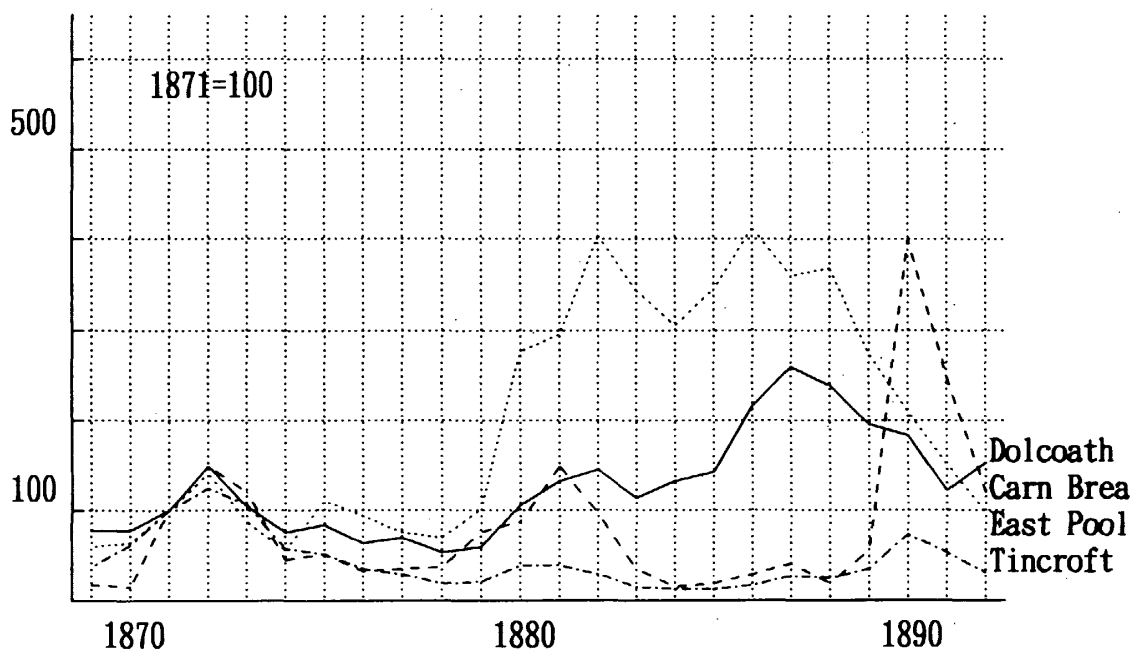
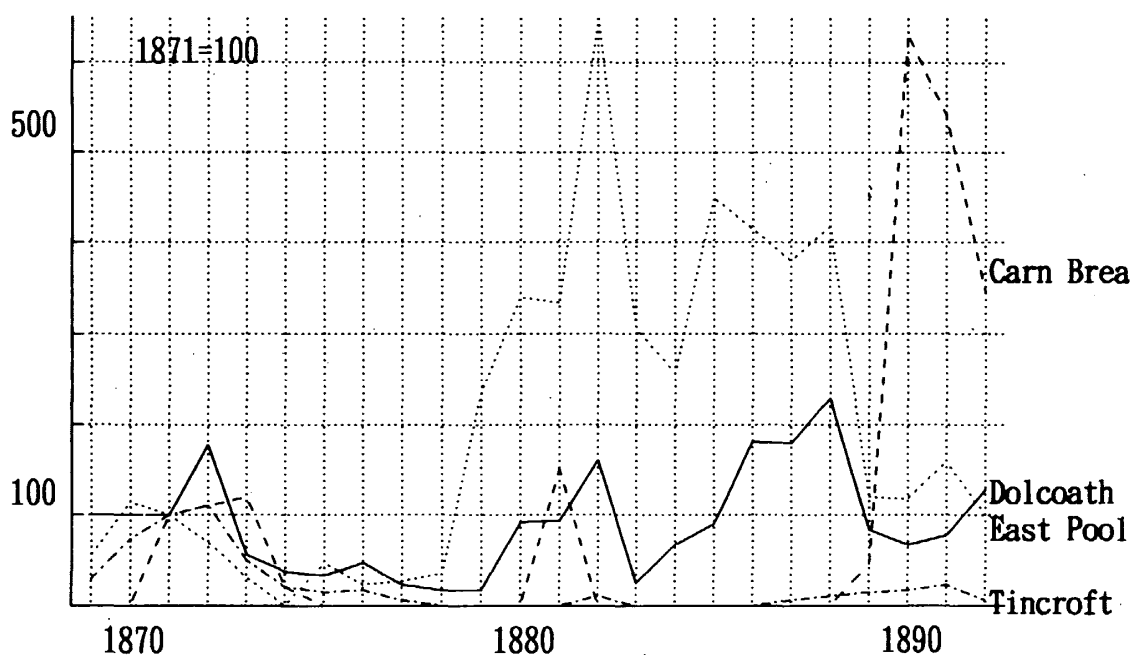


Figure2 Fluctuation of Dividends 1869-92



Sources : *The Mining Journal* and *The Stock Exchange Yearbook*