WHAT MOVED SHARE PRICES IN THE NINETEENTH-CENTURY LONDON STOCK MARKET?

Gareth Campbell (Queen's University Belfast)
William Quinn (Queen's University Belfast)
John D. Turner (Queen's University Belfast)
Qing Ye (Xi'an Jiaotong-Liverpool University)

What Moved Share Prices
in the Nineteenth-Century London
Stock Market?

GARETH CAMPBELL[1]
WILLIAM QUINN[1#]
JOHN D. TURNER[1]
QING YE[2]

Abstract

Using a new weekly blue-chip index, this paper investigates the causes of stock price movements on the London market between 1823 and 1870. We find that economic fundamentals explain about 15 per cent of weekly and 34 per cent of monthly variation in share prices. Contemporary press reporting from the London Stock Exchange is used to ascertain what market participants thought were causing the largest movements on the market. The vast majority of large movements were attributed by the press to geopolitical, monetary, railway-sector, and financial-crisis news. Investigating the stock price changes on an independent list of events reaffirms these findings, suggesting that the most important specific events which moved markets were wars involving European powers.

Keywords: British financial history, financial markets, share price movements.

JEL Classification: N20, N23, N43.

[1] Queen's Management School, Queen's University Belfast.
[2] Department of Business, Economics and Management, Xi'an Jiaotong-Liverpool University.
Corresponding author: Queen's Management School and Queen's University Centre for Economic History, Queen's University Belfast, 185 Stranmillis Rd, Belfast, BT9 5EE, N. Ireland; Email: wquinn05@qub.ac.uk.

1. Introduction

Equity listings on the London Stock Exchange increased substantially during the nineteenth century, making London the leading stock market in the world.[1] The equity market played an important role in financing railways and other companies which helped transform the British economy in the nineteenth century. Equity also played an increasing role in individuals' investment portfolios.[2] However, we know very little about what moved equity prices in the short run or on a week-by-week basis on the London market during this formative period.

In order to analyse what moved the London equity market in this era, we construct a weekly blue-chip index between 1823 and 1870. We find that economic fundamentals, such as dividends, interest rates, exchange rates, gold prices and wheat prices, explain about 15 per cent of weekly movement in the stock market and up to 34 per cent of monthly movement. After identifying large movements in the stock market, we analyse contemporary press reporting on the market to ascertain what reporters thought were causing these large movements. Because stock trading was focused in the London Stock Exchange building, and journalists had direct access to traders on this market, it implies that the press were reporting on market participants' informed opinion of what was moving the market. Because of this unique institutional set-up, we are confident that we can identify what events were moving prices in this early equity market.

---

[1] See Acheson et al. 'Rule Britannia'; Grossman, 'New Indices'; Michie, *London Stock Exchange*, p. 88.

[2] According to the *Banking Alamanac and Yearbook* (1856), there were 35,331 shareholdings in British banks in 1855, and according to the *Returns of the Number of Proprietors in Each Railway Company in the United Kingdom* (P. P. 1856, CCXXXVIII), there were 166,125 shareholdings in British railways in 1855. See Rutterford et al., 'Who comprised the nation' for post-1870 estimates of shareholder numbers.

We identify 46 occasions on which there was a substantial market movement in the 1823-70 period. Contemporary newspaper reporting on market movements provides explanations for 40 of these substantial movements. In terms of the unexplained substantial movements, four can be accounted for by developments during the railway promotion boom of the mid-1840s, leaving only two movements with no proximate explanation. In terms of what the press perceived to be the causes of substantial movements in the market, about 50 per cent were attributed to geopolitical events such as wars and revolutions. The remainder were attributed to changes in monetary policy, financial crises, railway-sector news, and the effect of weather conditions on agriculture.

We then use the alternative approach of identifying an independent list of events that might be expected to move markets, and noting the changes to our index on those weeks. This methodology has the advantage of identifying events that might be expected to move markets, but do not. The results of this analysis suggest that conflicts involving major European powers, especially France, were perceived as extremely important by investors. However, imperial wars, and wars involving the U.S., are not typically accompanied by substantial movements.

This paper contributes to the historiography of British capital markets by, firstly, producing a high-frequency index for the 1823-70 period, and secondly, by analysing what was moving the market during this period. To date, scholars have developed monthly or annual stock market indices covering the nineteenth century for the UK.[3] Other studies of what moved the UK capital market in the nineteenth century have focused on the market for government debt.[4] Thus, this paper is the first study to look at what moved the UK equity

---

[3] Grossman, 'New Indices'; Acheson et al., 'Rule Britannia'.

[4] Elmendorf, Hirschfield and Weil, 'Effect of News'; Brown, Burdekin and Weidenmier 'Volatility'; Ferguson, 'Political Risk'.

market in its formative years, providing insights into what events and economic news influenced the value of early publicly-listed companies.

This paper also contributes to a growing literature which uses the capital market to provide insights into how contemporaries viewed the seriousness of historical events.[5] Since capital markets aggregate the views of many diverse investors, they provide economic as well as other types of historians with an insight into how contemporaries viewed the importance of particular events.

Our paper contributes to the literature in financial economics which focuses on what moves markets and how many market movements can be explained by changes in fundamentals. Cutler et al., for example, find that most large movements in the twentieth-century stock market cannot be explained by news relating to fundamental values.[6] Roll, Haugen et al., Mitchell and Mulherin, and Fair all report similar findings.[7] By way of contrast, we find that a greater proportion of movements in nineteenth-century share prices were explained by changes in fundamentals, and that most large movements were explained by the contemporary financial press.

This paper is structured as follows. Section two outlines our data sources and the methodology used to construct our weekly blue-chip stock index for the UK market. In section three, we regress various real and monetary data on stock price changes in order to assess which factors are affecting share prices and how much variation in stock-price movements can be explained by economic fundamentals. The fourth section identifies the dates of substantial movements in our blue-chip index and outlines the explanations provided

---

[5] Frey and Kucher, 'History'; Brown and Burdekin, 'German Debt'; Ferguson, 'Political Risk'; Choudhry, 'World War II Events'; Turner and Zhan, 'Property Rights'; Ho and Li, 'A Mirror of History'.

[6] Cutler, Poterba and Summers, 'Stock Prices'.

[7] Roll, 'Stochastic Dependence'; Haugen, Talmor and Torous, 'Effect of Volatility'; Mitchell and Mulherin, 'Impact of Public Information'; Fair, 'Events'.

by the contemporary press. In section five, we identify the dates of wars, large changes to the bank rate, and financial crises, and investigate the returns to our index on these dates in order to see if events which one would expect to move markets did not.

2. The equity market and stock price changes

The British equity market grew substantially over the period 1823 to 1870, with the number of equity securities doubling from just below 200 and the market value of equities growing from less than 10 per cent of GDP to 27 per cent of GDP.[8] There were four promotion booms which contributed to the expansion of the equity market: the first, in 1824-5, predominantly involved mining and insurance companies; the second, in the mid-1830s, involved joint-stock banks and railways, the third was the railway promotional boom of the mid-1840s, and the fourth was associated with the passing of the 1862 Companies Act, the final legislative act in the liberalisation of UK incorporation law. The cumulative effect of all these booms was to change the equity market from one dominated by canals, docks and insurance companies in 1825 to one dominated by railways, banks and insurance companies in 1870.[9]

To analyse what moved the nineteenth-century equity market, we develop a weekly blue-chip index of shares for the London equity market from 1823 to 1870.[10] The index consists of the primary common equity issue of the 30 largest companies on the London market. The index excludes State-chartered entities such as the Bank of England because we are interested in what was moving the equity prices of wholly private companies and not those closely aligned with the State. The constituents of the index in year t were based on the

---

[8] Acheson et al. 'Rule Britannia', pp. 1114-6.

[9] In 1825, canals, docks and insurance companies had 84 per cent of market capitalisation and in 1870, banks, railways and insurance companies had 78 per cent – see Acheson et al., 'Rule Britannia', pp. 1117-8.

[10] We follow the method laid out in Le Bris and Hautcoeur, 'A Challenge to Triumphant Optimists'.

30 largest companies by market capitalisation at the end of year t-1. Thus the constituents of the index changed annually so that the index reflects changes in the industrial composition of the market over time. To make sure that the index did not become dominated by one sector, we added additional companies to the index if there were more than 20 companies from the one sector in it. This only occurred on two occasions – 1848 and 1849, when one and six non-railway companies respectively were added to the index. The constituents of the index are in Appendix Table 1. From Table 1, which shows the industrial make-up of the index over the sample period, we see that financial companies are an important component of the index across time, whilst canals, and later railways, are also prominent. This implies that our blue-chip index is representative of the overall equity market. In addition, given that the industries which make up our index served a wide variety of other industries and businesses in this era, our index reflects a wide variety of industrial experiences in this era.

<<INSERT TABLE 1 HERE>>

A caveat has to be placed on the exercise we are undertaking because the British equity market was in its infancy in this period and we need to make allowance for the historical context that the British equity market operated in.

First, the companies which traded on the equity market had a small base of shareholders, numbering in the hundreds and in the case of a few large railways and banks in our index, the thousands.[11] This meant that most stocks would have been relatively illiquid. The small shareholder constituencies would have also meant that shareholders were intimately knowledgeable about the companies they invested in and company specific information may have moved share prices more than wider economic events. This implies that we should not find wider economic and political events playing as much of a role in moving stock prices as they do today.

---

[11] Acheson et al., 'Corporate ownership'.

Second, the index is a reflection of what was traded on the London market and it may not always accurately reflect what was happening in the provinces and provincial stock exchanges.[12] Some of the companies, particularly the railways and canals, would have been exposed to particular regional factors, but as our results will show, we do not find much evidence of major region-specific events having an impact.

Third, in this era, several companies established in the UK, and listed their equity on the London market, but operated in the colonies. As can be seen from Appendix Table 1, there are several overseas and colonial banks in our index at various times – these were pioneers of British multinational banking.[13] They listed in London because they raised most of their capital, and some deposits, in the UK and they were originally set up to finance foreign trade between colonies and the UK.[14] Arguably, the share prices of these banks will be affected by the conditions in the country they are operating in, but because of their connection to the UK in terms of raising funds and financing trade with the UK, they would also have been be affected by economic conditions in the UK. However, most of the overseas banks in our index are only in it for two to three years and only three overseas banks are in the index for a long period – Bank of Australasia, Oriental Bank Corporation and Union of Australia. As a robustness check, this paper's analysis is repeated with these three firms removed, but this results in no material difference to our findings.

The source of our share price, nominal capital, paid-up capital, and number of issued shares data is the *Course of the Exchange* (*COE*), which was a stockbroker list for the London market published on a Tuesday and Friday. To calculate the weekly index, we took the price reported in the Friday issue of the *COE* for each week between 1823 and 1870. In total, we have 74,827 observations spread over 2,505 weeks.

---

[12] On the rise of the provincial stock exchanges, see Thomas, *Provincial Stock Exchanges*.

[13] See Jones, *British Multinational Banking* for the history of these banks.

[14] Jones, *British Multinational Banking*, p.14.

Stocks in the period often did not have all their capital paid up.[15] The price listed in the *COE* reflected only paid-up capital, so this price could change dramatically when companies made calls on capital. We make appropriate adjustments to our calculations of stock price changes on dates where calls were made, on dates where additional equity was issued, and on dates when stock and reverse stock splits occurred.[16] We are unable to adjust our return series for ex-dividend effects because ex-dividend dates are not systematically reported in the *COE* – less than 40 per cent of dates are reported.[17] There are also problems with stale reporting of ex-dividend dates and stale share prices being reported on ex-dividend dates. However, although we cannot adjust every company with regards when their dividends are paid, we do control for potential clustering of ex-dividend dates in the next section of the paper.

We calculate both price-weighted and equally-weighted returns. These returns are not total returns, but capital appreciation i.e., percentage changes in stock prices. We use returns in this paper as a short hand for capital appreciation. The price-weighted returns were calculated as follows:

Index return at week t: $R_t = \sum_{i=1}^{N} (w_{i,t} \times r_{i,t})$ (1)

$$\text{with } w_{i,t} = p_{i,t-1} / \sum_{i=1}^{N} p_{i,t-1} \quad \text{and}$$

$$r_{i,t} = [(p_{i,t} - p_{i,t-1}) - (c_{i,t} - c_{i,t-1})] / [p_{i,t-1} + (c_{i,t} - c_{i,t-1})]$$

where N is the number of stocks, p_i is the price of stock i at time t and c_i is the paid-up value of stock i at time t.

---

[15] Acheson et al., 'Character and Denomination'.

[16] When capital is called up, we adjust returns by the size of the capital call. When splits occurred or additional equity was issued, we omitted those stocks from the index on the relevant dates.

[17] For more on dividend policy in this era, see Turner et al., 'Why do firms pay dividends?'

Equally-weighted returns were calculated as follows:

Index return at week t: $R_t = \sum_{i=1}^{N}(w_{i,t} \times r_{i,t})$ (2)

with $w_{i,t} = 1/N$ and

$$r_{i,t} = \ln\{[(p_{i,t}\text{-}p_{i,t\text{-}1})\text{-}(c_{i,t}\text{-}c_{i,t\text{-}1})]/[p_{i,t\text{-}1}+(c_{i,t}\text{-}c_{i,t\text{-}1})]\}$$

where N is the number of stocks, p_i is the price of stock i at time t, and c_i is the paid-up value of stock i at time t.

As some stocks were infrequently traded, we calculate two sets of returns for the sake of robustness: one which includes only information on stocks which traded on consecutive weeks and one which assumes that stocks not traded on a particular week did not change in price. Since the method we use does not dramatically alter our conclusions, only the latter are reported for the sake of brevity.

As we are particularly interested in large movements of the market in general, we want to differentiate between large movements in the index due to substantial movements in one or two stocks as compared to a general movement of the overall market. We therefore construct a co-movement differential variable, which is defined as the difference between the number of stocks which increase in price in week t and the number of stocks which decrease in price in week t.[18]

Figure 1, which shows the weekly equally-weighted returns, reveals that there are some large weekly movements across the period. In Figure 2, it is clear that the distribution of stock returns is leptokurtic relative to the normal distribution, with substantially more extreme values. This is consistent with the observed distribution of modern stock-price

---

[18] An alternative approach, used by Chang et al., 'An examination of herd behavior' measures the dispersion of stocks around the mean.

returns, eighteenth-century British stock returns, and eighteenth-century Dutch stock returns.[19]

<<INSERT FIGURES 1 and 2 HERE>>

Table 2 contains summary statistics for the returns and co-movement series. Notably, the co-movement series ranges from -22 to 20, implying a lot of co-movement at particular times.

<<INSERT TABLE 2 HERE>>

3. Economic fundamentals and market movements

In this section, we assess the fraction of share price movements which can be accounted for by changes in economic fundamentals or conditions. As macroeconomic data was not produced in the nineteenth century, we use contemporarily-available data on real and monetary conditions to ascertain how much these variables explain share price movements. We use the Bank Rate, which was the Bank of England's minimum discount rate, as a proxy for the short-term interest rate and as a measure of general monetary conditions.[20] To further capture monetary conditions, we use weekly data on the Paris exchange rate as well as the price of foreign gold bars, both of which were obtained from the *COE*. The Paris exchange rate can also be considered as a proxy measure for international trading conditions. For the sake of robustness, we use the Frankfurt exchange rate as reported by the *COE* as an alternative, but it makes no difference to our findings.

We use the yield on three per cent Consols as a proxy for the long-term nominal interest rate. Consol prices were obtained for Fridays from the *COE*. We also include the price of Bank of England stock because it dominated the pre-1870 equity market in terms of

---

[19] Harrison, 'Similarities'.

[20] Bank rate is reported in Clapham, *Bank of England*, Vol. II, pp. 419-30.

market capitalisation and was the locus of the monetary system.[21] The Friday price of Bank Stock was obtained from the *COE.*

To capture the effect of real business conditions, we use the average dividend per share / paid-up capital per share ratio for the constituent stocks in the index. This ratio was obtained from the *COE* for each stock for each week and it changed whenever there was an alteration in a company's dividend policy.

To account for potential clustering of ex-dividend dates, we utilise the limited information on ex-dividend dates in the *COE* and include the number of shares reported as being ex-dividend in a particular week as an explanatory variable in the regression. The dynamics of our regression set-up captures that stale share prices may have been reported in the ex-dividend week and that prices may only have changed in subsequent weeks. However, the coefficients on lags of this variable are not significant, indicating that this was unlikely to be a major issue.

Finally, given the importance of wheat at the time in determining the real wages of workers, we also use wheat prices as an economic fundamental. Wheat prices in this era have also been viewed as a proxy for what Rostow termed social tension, since high food prices contributed to social unrest.[22] From 1823-1844, the minimum weekly price reported in the *COE* is used. From 1845-1864, the average weekly price reported in *The Economist* is used, and from 1865 onwards, the average weekly price reported in the *London Gazette* is used.

We take first differences of each of these explanatory variables to create stationary variables. Summary statistics for each of our variables are reported in Table 3. Augmented

---

[21] The correlation coefficient between Bank stock and Consols is only 0.20, so including both variables in the specification is unlikely to create collinearity problems.

[22] Rostow, *British Economy*, pp.123-5; Storch, 'Popular Festivity'.

Dickey-Fuller tests reported in Table 3 suggest that none of these explanatory variables contains a unit root and can therefore be treated as stationary.

<<INSERT TABLE 3 HERE>>

In order to provide a robust point of comparison with modern markets, we replicate the approach used by Cutler et al. which consists of two parts: a restricted vector autoregression (VAR) and an unrestricted regression.[23] The restricted approach isolates the component of each of our economic time series that cannot be explained by past values of itself or other time series, creating seven 'news' variables. The share price returns are then regressed on each of these news variables. The unrestricted approach simply regresses the returns on each fundamental variable, using a variety of lags and leads. The explanatory power of news is assessed by comparing the adjusted R-squared of models using lags to models which also include contemporaneous and lead values.

3.1 Structured VAR evidence

The structured VAR methodology is as follows. First, we run a vector autoregression (VAR) which includes only the explanatory variables. We then save the residuals from each regression in the system in order to isolate the component of each variable that is not explained by previous values of either itself or the other explanatory variables. These residuals are hereafter described as 'news' variables.

The stock-price returns are then regressed on each of the news variables in the equation:

$$R_t = \alpha_0 + \alpha_1\zeta_{1t} + \alpha_2\zeta_{2t} + \alpha_3\zeta_{3t} + \alpha_4\zeta_{4t} + \alpha_5\zeta_{5t} + \alpha_6\zeta_{6t} + \alpha_7\zeta_{7t} + \alpha_8\zeta_{8t} \qquad (3)$$

where R_t is the stock price return at time t and $\zeta_1, \zeta_2 \dots \zeta_8$ are the 'news' variables. The results of these regressions for a variety of VAR lag lengths are reported in Table 4. Newey-West

---

[23] Cutler et al., 'Stock Prices'.

standard errors are used because Breusch-Pagen tests indicate heteroscedasticity in the model. We find that the 'news' variables explain only 8 to 10 per cent of weekly variation over the entire period. Limiting the sample to post-1844 causes the adjusted R-squared to rise to 11-14 per cent. When the methodology is repeated for monthly data, this rises to 11-21 per cent for the full sample and 24-26 per cent for the post-1844 period. This is substantially more variation in monthly data than can be explained by macroeconomic news variables in the twentieth century stock market.[24]

One question which arises from the above is why the 'news' variables explain more of the weekly variation post 1844? One possible explanation is that the emergence of railway stocks created a more liquid market because railways had large capital issues and a diffuse shareholder base, which numbered in the thousands for the railways in our index by the early 1850s.[25] The majority of companies prior to 1844 had less than 1,000 shareholders. Another explanation is that investors were learning through time how to interpret events and economic data, and so were more responsive to 'news' variables post-1844. A further explanation is that the development of telegraph system in the 1840s transformed communication flows between the London market and other UK cities, enabling investors and brokers in the regions to generate immediate buy and sell orders in response to events.[26] The connection of the London market to those in Paris and New York in 1851 and 1866 respectively also quickened information flow between markets.[27]

<<<INSERT TABLE 4 HERE>>>

---

[24] Cutler et al., 'Stock Prices'.

[25] *Returns of the Number of Proprietors in Each Railway Company in the United Kingdom* (P. P. 1856, CCXXXVIII)

[26] Michie, *London Stock Exchange*, p. 73.

[27] Michie, *London Stock Exchange*, p. 74.

3.2 Unrestricted regression evidence

The structured VAR methodology suffers from two potential problems. First, it does not capture new information revealed at time t about future changes to fundamental variables. Second, stock trading during the sample period was less liquid than in the modern era and therefore share prices may not have incorporated all new information quickly. This is reflected in positive autocorrelation between current and lagged values of the share price index.[28] As a result, changes in a particular variable at time t-1 may still have an effect on share returns at time t.

In order to overcome these issues, we use a less structured approach, whereby share-price returns are regressed on past, current, and future values of economic time series.[29] In this section, stock-price returns are regressed on economic fundamentals in three stages: (1) lagged values only; (2) lagged values plus current values; and (3) lagged values, current values and one future value. The difference in the adjusted R-squared for each stage of regressions describes the relative explanatory power of past, present, and future information. Using future values introduces an obvious reverse-causality issue, and we report these results for informational purposes only.

The proposed relationship is not directly causal; rather, many of the explanatory variables are thought to act as proxies for types of news with relevance for the share market. It is unlikely that share market values are affecting past or present values of explanatory variables, given the relative economic insignificance of the equity market in this period.[30]

---

[28] An AR(4) model reveals statistically significant first and second lags of returns, with coefficients of 0.1890 and 0.0938 respectively.

[29] Cutler et al., 'Stock Prices'.

[30] Acheson et al., 'Rule Britannia'.

The Paris exchange rate is a possible exception, but since it explains very little share price variation, this is not a serious issue.

The adjusted R-squared values from the unrestricted regressions are presented in Table 5. Using weekly data, current values explain around 9 per cent more variation than lagged values alone, increasing to 13 per cent for the period after 1844. For monthly data, this increases to around 22 per cent and 34 per cent respectively. Interestingly, this is substantially more variation than can be explained in modern monthly stock prices using macroeconomic data.[31]

<<INSERT TABLE 5 HERE>>

The inclusion of future values rarely increases the explanatory power of the model by more than 1 per cent. This contrasts sharply with the findings of Cutler et al. who show that the explained proportion of twentieth century share price variation increases by up to 10 per cent on the addition of lead values.[32] They interpret this as predominantly due to the effect of changes in the share market on future macroeconomic activity. It therefore appears that changes in nineteenth-century share prices had little effect on future economic activity as proxied by our variables, which is unsurprising given the small size of the stock market relative to overall economic activity.

3.3 Which variables moved share prices?

Table 6 shows the coefficients of variables from unrestricted regressions using weekly and monthly data. Each regression includes three lags, contemporaneous values, and one lead value of each variable. For the weekly data, contemporaneous changes in Bank stock, the

---

[31] Cutler et al., 'Stock Prices'.

[32] Cutler et al., 'Stock Prices'.

Bank Rate, and Consols all have a statistically significant effect on stock returns. In the case of Consols, a one per cent increase (fall) in Consol prices is associated with a contemporaneous 0.29 per cent increase (fall) in stock returns. The equity market takes time to adjust to changes in Consol prices as a one per cent increase (fall) in Consol prices this week is associated with a 0.14 per cent increase (fall) in stock returns in the following week. The primary determinant of Consol prices in the nineteenth century was both national and international political events.[33] Thus we can see that both national and international political events may have played a role in moving the nineteenth-century equity market.[34]

<<<INSERT TABLE 6 HERE>>>

From Table 6, we see that a one percentage point increase (fall) in Bank Rate is associated with a contemporaneous 0.23 per cent fall (increase) in stock returns. This suggests that changes in Bank Rate are quickly reflected in stock returns and that the market does not necessarily anticipate changes in Bank Rate. Overall, these results imply that monetary and credit conditions were important movers of stock prices in the nineteenth century.

Changes in the price of Bank Stock have little economic effect, with a one per cent change in Bank Stock associated with a 0.03 per cent change in stock returns. The results in Table 6 also reveal that a one per cent increase (fall) in the Paris exchange rate is associated

---

[33] Ferguson, 'Political Risk'.

[34] Politicians and peers of the realm may have had access to inside information on companies because many of them served as company directors or were closely linked to financiers. Politicians and peers were also investors in this era and they may have had inside information on political events, which they could have exploited in buying and selling shares. This insider trading could therefore be affecting our indices of capital appreciation. However, the limited available evidence suggests that insider trading was not prevalent in the Victorian era (Braggion and Moore, 'How insiders traded'). In addition, the illiquidity of the equity market would have made it very difficult for insiders to exploit their informational advantages.

with a 0.013 per cent fall (increase) in stock returns in the previous week. This suggests that share price changes had a small impact on the future Paris exchange rate.

The coefficients in Table 6 suggest that a 1 per cent increase (fall) in the price of foreign gold in bars is associated with a contemporaneous increase (fall) in share price returns of 0.10 per cent. One additional firm in the sample going ex-dividend in a given week is associated with a contemporaneous decrease in returns of -0.06 per cent. However, changes to average dividend-par ratios and wheat prices do not appear to have any effect on share prices.

Table 7 shows the results of Granger causality tests of the effect of each variable on the share price index, and vice-versa. At a five per cent significance level, changes to the Bank rRate, price of Consols, price of wheat, and number of firms going ex-dividend can explain some variation in future share prices, while changes to the price of Bank of England stock, Paris exchange rate, price of gold and dividend payments do not. The share price index can explain future variation in the Bank Rate, price of Consols, Paris exchange rate, price of gold and number of firms going ex-dividend.

<<<INSERT TABLE 7 HERE>>>

The main difference between the monthly and weekly regressions is that the coefficients of the Consols and Bank Rate variables are considerably larger for monthly data. A one per cent increase (fall) in Consol prices is associated with a contemporaneous 0.51 per cent increase (fall) in stock returns and a one percentage point increase (fall) in Bank Rate is associated with a contemporaneous 0.61 per cent fall (increase) in stock returns. Changes in share prices also appear to have some predictive power for the following month's Paris Exchange rate and price of Bank Stock.

This section has demonstrated that real and monetary data explain up to 15 per cent of weekly variation and 34 per cent of monthly variation, with the explanatory power of our

variables increasing considerably after 1844. However, a considerable proportion of share price movements remain unexplained. This is revealed by a closer look at the residuals from the weekly regression in Table 6. The absolute residuals correlate very strongly with absolute stock returns, with a correlation coefficient of 0.91. In addition, many of the largest movements in the index coincide with the largest residuals: the average absolute return for the 20 largest absolute residuals is 4.0 per cent, compared to 0.5 per cent for all residuals.

4. Press commentary on large market movements

In this section, we identify weeks in which the share market experienced a substantial positive or negative return and examine the explanations provided for these by the contemporary press. This will provide insights into what types of events had the most impact on prices during this era.

Applying this methodology to modern markets is generally problematic, because the number of trades is so large that they are effectively unobservable. As a result, newspapers are forced to attribute a cause to large movements *ex post*. This can result in disagreements between newspapers, making it difficult to use the press to determine the true cause of share price movements. In contrast, all trades in the period 1823-1870 were, by law, conducted from the floor of the London Stock Exchange.[35] Bid and ask prices were announced publicly, and news was brought to the Exchange through official announcements. Journalists could therefore discuss the reasons for share price movements with the brokers and jobbers, and observe the general reaction to news announcements. The resulting newspaper sections provide detailed daily accounts of exactly when prices changed, the reasons why they changed, and sometimes details on which investors had caused prices to change. The relative accuracy of these reports can be seen from the remarkable absence of disagreement between

---

[35] Michie, *London Stock Exchange*, p.48.

daily newspapers as to the cause of movements. All 22 movements reported in both *Daily News* and *The Morning Chronicle* between 1847 and 1861, when the latter ceased publication, were attributed to a similar cause, despite these newspapers holding directly opposing political views. In summary, this unique institutional environment enables us to identify the ultimate causes of major market movements.

In order to understand what was moving markets, we need to identify substantial movements in this era. We define a substantial movement in the stock market as an increase or decrease of 1.5 per cent in both the equally-weighted returns and price-weighted returns. A 1.5 per cent return is more substantial than it appears by modern standards since it is equivalent to about 2.3 standard deviations from the mean. We use both series of returns in combination to eliminate large returns which may be a result of choice of weighting. To account for the effect of large idiosyncratic movements in one or two stocks on our stock-market index, we also require that the co-movement differential be at least plus or minus five, depending on whether returns have increased or decreased. In order to account for the potential clustering of ex-dividend dates, we omit stocks from our calculations of returns when the *COE* reports that they are ex-dividend.

As can be seen from Table 8, applying this method results in 27 dates on which there was a substantial negative weekly return and 19 dates on which there was a substantial positive return. The median absolute return of the 46 substantial movements is 2.9 and the vast majority of these substantial movements are well above the 1.5 per cent threshold. The median positive return is 2.6 per cent and the median negative return is -2.9 per cent. The largest positive weekly return is 5.7 per cent and the largest negative return is -5.2 per cent. Notably, only four of the 46 substantial movements occur before 1845. This is consistent with the fact that the arrival of the large railways in the mid-1840s resulted in a more liquid market, but it may also reflect the absence of major events in this period. In comparison to

the stock market in the twentieth century, substantial movements in this era were much smaller, perhaps suggesting a much less volatile market.

<<<INSERT TABLE 8 HERE>>>

Table 8 also contains the return on Consols and the excess returns of stocks over Consols. One reason for comparing stock returns to the return on Consols is that it enables us to see which substantial stock movements can be attributed to changes in the risk-free rate, as proxied by the return on Consols. As can be seen from Table 8, there are 15 occasions when the absolute return on Consols is above 1.5 per cent and only four when it is between 1.0 and 1.5 per cent. Consequently, the absolute excess return on stocks exceeds 1.5 on 31 occasions, with 14 occasions when the excess return is negative and 17 when it is positive. Overall, the evidence in Table 8 suggests that large stock movements were accompanied by large Consol movements on about 40 per cent of occasions.

Having identified the substantial share price movements, we then use daily newspaper reports of stock market activity to establish a proximate cause for each event. The era covered in this study marked the beginning of extensive press coverage of financial markets.[36] *The Times* (est. 1785) was by some distance the leading newspaper, with an estimated annual circulation of 8.9 million in 1845.[37] However, its commentary on the equity market was sporadic and concise until the development of the market for railway shares, and even then its commentary rarely offered an analysis of market movements. By way of contrast, the *Morning Chronicle* (est. 1769) and, in particular, the *Daily News* (est. 1846) had extensive coverage of the stock market in terms of reporting on the reasons for market movements. In 1846, the former had an annual circulation of 1.3 million and the latter had a circulation of

---

[36] Preda, 'Popular Investor'; Campbell, Turner and Walker, 'Media'; Taylor, 'Watchdogs'.

[37] Simmons, 'Victorian Railway', p.240; *Return of the Number of Newspaper Stamps at One Penny* (P. P. 1852, XLII).

3.5 million.[38] Given the superiority of the reporting on the stock market by the *Daily News*, we use it as our newspaper source from 1846 onwards. The reasons given for stock movements in the *Daily News* were cross-referenced with those reported in the *Morning Chronicle* and *The Times* to ensure the veracity of the explanation given.

The press explanations for each substantial stock-market movement are summarised in Table 8. The ten largest falls in the stock market are largely the result of political events: the Crimean War, Franco-Prussian War, and French revolution of 1848 account for four of the five largest weekly losses on the stock market. Financial crises account for two of the ten largest falls in the stock market. The ten largest increases are attributed by the press to various factors, with none associated with equivalent movements in the Consols market. Two of these ten increases are substantial movements which neither the press nor we can attribute to any particular cause.

The explanations given in Table 8 have been coded into different categories, namely Political (P), Monetary (M), Financial Crisis (F), Railway sector (R), Weather (W) or Unexplained (U). Nine substantial movements have two explanation categories, and one substantial movement has three. In these instances, we categorise the movement as having two or three possible explanations. Notably, political explanations are included in each of these ten cases.

Summary statistics for each category of news are reported in Table 9. Political factors were fully or partially responsible for 26 of the large movements identified. These were typically associated with large movements on the Consols market, but the absolute excess return on stocks still exceeds 1.5 per cent on 15 occasions.

<INSERT TABLE 9 HERE>

---

[38] *Return of the Number of Newspaper Stamps at One Penny* (P. P. 1852, XLII).

As can be seen from Table 8, political events associated with large movements were rarely about domestic issues. The only such examples are the 1826 budget which was unfavourably received by markets and two reactions relating to the Corn Law debate at the end of 1845. Rather geopolitical events in Europe such as wars, rumours of wars, and revolutions were the most common political causes of stock-price fluctuations: the French revolution of 1848, Crimean War, Second Italian War of Independence, Luxembourg Crisis, and Franco-Prussian War were all associated with at least one substantial movement. At times the market moved in response to a perceived change in the threat of a conflict, even if one did not occur. For example, an unusually belligerent King's Speech in 1830 precipitated a large stock price decline, and the Trent Incident of 1861 was said to have caused a negative shock to stock prices, with investors anticipating British involvement in the American Civil War. Conversely, stock prices increased in response to the signing of major peace treaties in 1856, 1859, 1866 and 1867. The commitment of the U.S. to fighting Canadian rebels in 1838 also resulted in an increase in the market.

Eleven substantial movements are fully or partially attributed to monetary phenomena, most commonly a change in the Bank of England's minimum discount rate. As can be seen from Table 9, these factors have a larger effect on stock prices than Consols, with the average absolute excess return being 2.20 per cent. Interestingly, all the major movements attributed to monetary factors are positive. Thus, it appears that on some occasions the stock market responded positively and substantially to the easing of monetary conditions.

Seven major movements were attributed by the press to a financial crisis (Table 9). In each of these episodes, stock and Consol prices both fall, thus the absolute excess return on the market is the lowest for any category in Table 9. Financial crises in the nineteenth century were usually associated with businesses struggling to discount bills and commercial

bankruptcies, so the fact that financial crises caused substantial movements in the market is perhaps unsurprising. During the sample period, there were financial or commercial crises in 1825-6, 1837-9, 1847, 1857 and 1866. Notably, the three most severe crises (1825-6, 1847 and 1866) all caused substantial movements in the stock market.

Only one substantial movement in Table 8 (16 August 1867) is fully attributed to good weather raising the prospect of an abundant harvest. However, movements in August and September 1866 are partially attributed to weather conditions. Given the importance of agriculture to the economy, it is unsurprising that weather moved the market.

Four substantial movements in Table 8 are attributed to the railway industry. After the mid-1840s, the railways dominated the stock market, constituting more than half of total market capitalisation up until 1870.[39] Consequently, it is not surprising that major railway news moved the stock market, but had little effect on the market for Consols (Table 9). Thus railway news appears to have directly affected the expected future profits of underlying firms.

Four of the six 'unexplained' movements occurred during the episode known as the 'Railway Mania' in the mid-1840s, where hundreds of new railway companies were promoted and railway stocks suffered a substantial asset price reversal. The increase of 30 May 1845 was at the height of the speculative fever in the market for railway stocks, and the fall in the market on 24 October 1845 was just after very critical editorials in *The Times* and the *Economist*.[40] The large share price falls on 23 June 1848 and 13 October 1848 are associated with railway companies issuing large calls on shareholders for unpaid capital, with investors offloading shares to avoid making these payments.[41] If we accept these

---

[39] Acheson et al., 'Rule Britannia', pp.1118-9.

[40] Campbell, 'Myopic Rationality'; Campbell et al., 'Media'.

[41] Campbell, 'Deriving'. Rumours of capital calls are also mentioned by *The Morning Chronicle* as a potential cause of this movement, but the paper wrongly dismisses these rumours as false.

rationalisations for stock price movements on these dates, we are left with just two movements with no clear explanation: 13 December 1850 and 7 June 1867.

Including dummies for these events in the 24-lag unrestricted regression increases the adjusted R-squared from 0.20 to 0.33 (not tabulated). The unexplained component, the remainder, is likely driven by smaller news stories which would have moved prices on a frequent basis, and company-specific information.

There are fewer large unexplained movements in our index than in modern markets, and even the largest movements are of a much smaller magnitude than those observed in the U.S. markets post World War II.[42] What might be the reason for this? There are many possible candidates: a lower frequency of trading; an absence of institutional investors; a lower level of liquidity in the market; or a greater emphasis on company-specific news.

5. Major events and market movements

In the previous section, we identified substantial movements in the equity market and examined the contemporary press to ascertain the causes of those movements. The three most common types of events which moved markets were wars and conflagrations, changes in monetary policy, and financial crises. Did these types of events have a consistent and predictable effect on share prices throughout this period? Were there any similar events that, given the results of section 4, might have been expected to move markets, but did not?

In order to answer this question, this section identifies independent records of wars, bank rate changes, and financial crises, and investigates the returns on corresponding dates. This methodology has been used by Niederhoffer and Elmendorf, Hirschfield, and Weil, and has the potential to provide more precise insights into which type of event contemporaries

---

[42] Cutler et al., 'What Moves Stock Prices?'

believed was important.[43] For example, determining exactly which types of conflict mattered to markets requires the identification of wars to which share prices did not respond.

As an independent list of wars, we use the intra-state, inter-state and extra-state war packages compiled by the Correlates of War project.[44] This list is edited to include only wars involving at least one of the UK, France, Italy, Netherlands, Austria, Prussia, Russia, or the United States, resulting in a total of 70 wars. Seven wars for which the start date is unknown or uncertain are excluded, bringing the total to 63.[45] These wars are then categorised according to the nature of each war and whether the UK was directly involved.

Table 10 shows the complete list of wars alongside the corresponding returns on the index.[46] The point at which markets respond to the declaration of war is expected to vary, so the returns at week t-1 and week t+1 are also reported. Wars between European powers were consistently received negatively by markets, even when Britain was not involved. The impact of European rebellions varies: the French rebellions in 1848 and 1849 result in negative returns, as do the Viennese, Milan, and Hungarian revolts of 1848. However, earlier independence movements generally do not. Colonial skirmishes rarely appear to have any impact on share prices, even those involving the UK. Neither of the major wars involving the U.S. had any impact on share prices.

<<<INSERT TABLE 10 HERE>>>

---

[43] Niederhoffer, 'Analysis'; Elmendorf et al., 'Effect of News'

[44] Sarkees et al., *Resort to War*.

[45] Excluded wars are the First and Third Murid Wars, Uruguay War, the French-Tukulor War, the British-Santal War, the British-Bhutanese War and the British-Ethiopian War.

[46] The negative movement before 20 June 1866 results from a fall in the price of Agra and Masterman's stock, which is a constituent of the index. It is not identified as a large movement in the previous section because its low share price means it has very little effect on the price-weighted returns.

In general, conflicts are seen to have a consistent effect on share prices. The only example of an inter-state European conflict not accompanied by a substantial share price movement is the Franco-Spanish War of 1823. This is perhaps because this conflict was a continuation of an internal Spanish conflict, and posed no real threat to French political stability. There are no other clear examples of a conflict that unexpectedly had no influence on share prices.

<<<INSERT TABLE 11 HERE>>>

Table 11 shows all substantial changes to the Bank Rate during the sample period, as reported by Clapham, alongside the returns before and after each change.[47] A substantial change is defined as a change of 1.5% or more in a single week. Under normal conditions, bank rate increases (decreases) are expected to result in negative (positive) returns. Three bank rate increases are notably not accompanied by the expected share price changes. The increase of 29th October 1847 is of particular interest, as it is accompanied by significant positive returns. This occurs during a financial crisis, and Turner reports that money markets were reassured at the beginning of the week by the government indemnifying the Bank of England from breaking the Bank Charter Act.[48] The increase of 6th November 1863 does not appear to affect markets either, and the *Daily News* reports that this was because the increase was 'very generally anticipated and prepared for'.[49] The increase of 16th November 1860 was notably larger than expected, however, and is followed by modest negative returns the following week. The *Daily News* reports that returns were not as negative as might be expected because the general body of investors approved of the Bank of England's policy.[50]

---

[47] Clapham, *Bank of England*, Vol. II, pp. 419-30.

[48] Turner, *Banking in Crisis*, p. 74.

[49] *Daily News*, 'Money Market', 6th November1863.

[50] *Daily News*, 'Money Market', 16th November 1860.

The only bank rate decrease inconsistent with the expected relationship is that of 17th August 1866, when returns were actually negative. This occurred during a turbulent period for stocks, following both the 1866 financial crisis and Seven Weeks War, both of which had exerted downward pressure on share prices. The positive returns on 6th September 1844 are relatively modest, occurring during the week in which the 1844 Bank Charter Act came into operation.

A third category of large movement is financial crises, which accounted for seven large weekly share price movements in the previous section. Turner reports five financial crises in this period, occurring in 1825-26, 1836, 1847, 1858, and 1866.[51] Following Turner, each crisis is dated according to the week when the crisis reached its apex in that Bank of England (and government) assistance was given to the money markets. In the case of 1857, two dates are investigated: 8th October, when the Bank of England began to rapidly increase the discount rate, and 9th November, when the Western Bank of Scotland failed.

<<<INSERT TABLE 12 HERE>>>

The share price returns during these crises are reported in Table 12. All crises are accompanied by substantial negative returns of less than -1.4 per cent. In the case of the 1825-26 crisis, this understates its impact: there are seventeen consecutive weeks of negative returns between November 1825 and March 1826, and the share price index does not stabilise until the summer of 1826. In terms of severity, the 1847 and 1866 crises also appear to have had more of an impact than those which occurred in 1836 and 1857. However, it is notable that both the 1847 and 1866 crises are followed by positive returns at week t+1, perhaps underlining the effectiveness of government and Bank of England policy in dealing with these crises.

---

[51] Turner, *Banking in Crisis*, pp.67-84.

This section has found few examples of conflicts that were not accompanied by the expected share price changes. Wars between European powers were generally considered more important by markets than either colonial wars or wars in the Americas. We have also found no examples of financial crises unaccompanied by a decline in share prices. However, the effect of changes to the Bank Rate varies based on the wider financial context and whether the change was anticipated.

6. Conclusion

Using a newly-constructed weekly stock-market index for the nineteenth-century, this paper has sought to understand what moved stocks in the period from 1823 to 1870. We find that changes in economic fundamentals explain around 15 per cent of the variation in stock prices for the entire period and up to 35 per cent in the post-1845 market. Short-term interest rates and proxies for long-term interest rates were important explanatory variables, with exchange rates and aggregate dividends being somewhat less important.

In terms of what caused substantial movements in the market in the nineteenth century, geopolitical events were the most common reason given by the press. Specifically, wars and revolutions involving European powers are especially important, but imperial wars and wars involving the U.S. are not. Other common causes of large movements include monetary policy, financial crises, and railway sector news.

The findings of this paper shed light on the development of the early equity market. In the era when equities became more widely held, it was economic and geopolitical news which affected stock prices most. This implies that they were regarded as being important risk factors and determinants of future performance, possibly helping to explain patterns of investment at this time.

The findings also imply that were some important differences between the equity markets of this era and modern markets. Changes in economic variables explain more of the movements in the historical period than in modern markets. In addition, the number and scale of substantial movements were smaller than we find in modern markets, suggesting that modern markets are much more volatile, and the press was able to provide explanations for the vast majority of substantial movements in the Victorian equity market. This differs from modern markets where the press and commentators are oftentimes unable to adequately explain substantial market movements. Another difference is that large movements in the Victorian era are much less likely to be attributed to monetary policy changes than in the modern era.[52] Future work should explore why the equity market evolved to become more volatile and why large market movements became more difficult to rationalise.

---

[52] Fair, 'Events'.

Footnote References

Consolidated List

Acheson, G. G., Hickson C. R., Turner J. D., and Ye Q., 'Rule Britannia! British stock market returns, 1825-1870', *Journal of Economic History*, 69 (2009), pp. 1107-1137.

Acheson, G. G., Turner J. D., and Ye Q., 'The character and denomination of shares in the Victorian equity market', *Economic History Review*, 65 (2012), pp. 862-86.

Acheson, G. G., Campbell G., Turner J. D., and N. Vanteeva., 'Corporate ownership and control in Victorian Britain', *Economic History Review* (2015): forthcoming.

Braggion, F. and Moore L., 'How insiders traded before rules', *Business History*, 55 (2013), pp.565-84.

Brown, W. O. and Burdekin R. C. K., 'German debt traded in London during the Second World War: A British perspective on Hitler', *Economica*, 69 (2002), pp. 655-69.

Brown, W. O., Burdekin R. C. K., and Weidenmier M. D., 'Volatility in an era of reduced uncertainty: Lessons from Pax Britannica', *Journal of Financial Economics*, 79 (2006), pp. 693-707.

Campbell, G., 'Myopic rationality in a mania', *Explorations in Economic History*, 49 (2012), pp. 75–91.

Campbell, G., 'Deriving the Railway Mania', *Financial History Review*, 20 (2013), pp. 1-17.

Campbell, G., Turner, J.D., and Walker, C.B., 'The media in a mania', *Explorations in Economic History*, 49 (2012), pp. 461-81.

Chang, E. C., Cheng, J.W., and Khorana, A., 'An examination of herd behavior in equity markets: An international perspective', *Journal of Banking & Finance*, 24 (2000), pp. 1651-1679.

Chen, L., Da Z., and Zhao, X., 'What drives stock price movements?', *Review of Financial Studies*, 26 (2013), pp. 841-76.

Choudhry, T., 'World War II events and the Dow Jones industrial index', *Journal of Banking and Finance*, 34 (2010), pp. 1022-1031.

Clapham, J. *Bank of England*, 2 vols. (Cambridge, 1944).

Cutler, D. M., Poterba, J. M., and Summers, L. H., 'What moves stock prices?', *The Journal of Portfolio Management*, 15 (1989), pp. 4-12.

Elmendorf, D. W., Hirschfeld, M. L., and Weil, D. N., 'The effect of news on bond prices: Evidence from the United Kingdom, 1900-1920', *Review of Economics and Statistics*, 78 (1996), pp. 341-44.

Fair, R., 'Events that shock the market', *Journal of Business*, 75 (2002), pp. 713-31.

Ferguson, N., 'Political risk and the international bond market between the 1848 Revolution and the outbreak of the First World War', *Economic History Review*, LIX (2006), pp. 70-112.

Frey, B. S., and Kucher, M., 'History as reflected in capital markets: The case of World War II', *Journal of Economic History*, 60 (2000), pp. 468-96.

Grossman, R. S., 'New indices of British equity prices, 1870-1913', *Journal of Economic History*, 62 (2002), pp. 121-46.

Harrison, P. 'Similarities in the distribution of stock market price changes between the eighteenth and twentieth centuries', *Journal of Business*, 71 (1998), pp. 55-79.

Ho, C. Y. and Li, D., 'A mirror of history: China's bond market, 1921-1942', *Economic History Review*, 67 (2014), pp. 409-34.

Haugen, R. A., Talmor E., and Torous, W.N., 'The effect of volatility changes on the level of stock prices and subsequent expected returns.' *Journal of Finance*, 46 (1991), pp. 985-1007.

Jones, G. *British multinational banking, 1830-1990* (Oxford, 1991).

Le Bris, David and Pierre-Cyrille Hautcoeur. 'A challenge to triumphant optimists? A blue chips index for the Paris Stock Exchange, 1854-2007.' *Financial History Review*, 17 (2010), pp. 141-83.

Michie, Ranald C. *The London Stock Exchange: A history.*(Oxford, 1999).

Mitchell, Mark L. and J. Harold Mulherin. 'The impact of public information on the stock market.' *Journal of Finance*, 49 (1994), pp. 923–950.

Niederhoffer, Victor. 'The analysis of world events and stock prices.' *Journal of Business*, 44 (1971), pp. 193-219.

Preda, Alex. 'The rise of the popular investor: Financial knowledge and investing in England and France, 1840-1880.' *The Sociological Quarterly*, 42 (2001), pp. 205-32.

Roll, Richard. 'The stochastic dependence of security price changes and transaction volumes: Implications for the mixture-of-distributions hypothesis.' *Journal of Finance*, 43 (1988), pp. 541-566.

Rostow, W. W. *British economy of the nineteenth century* (Oxford, 1948).

Rutterford, J, Green, D. R., Maltby, J. and Owens, A. 'Who comprised the nation of shareholders? Gender and investment in Great Britain, c.1870-1935', *Economic History Review*, 64 (2011), pp. 157-87.

Sarkees, M. R. and Wayman, F., *Resort to war: 1816 – 2007* (CQ Press, 2010).

Shiller, R. J., 'Do stock prices move too much to be justified by subsequent changes in dividends?' *American Economic Review*, 71 (1981), pp. 421-436.

Simmons, J., *The Victorian railway* (1991).

Storch, R. D., 'Popular festivity and consumer protest: Food price disturbances in the Southwest and Oxfordshire in 1867', *Albion: A Quarterly Journal Concerned with British Studies*, 14 (1982), pp. 209-234.

Taylor, J., 'Watchdogs or apologists? Financial journalism and company fraud in early Victorian Britain', *Historical Research*, 85 (2012), pp. 632-52.

Thomas, W. A. *The provincial stock exchanges* (1973).

Turner, J. D., Banking in Crisis: *The rise and fall of British banking stability* (Cambridge, 2014).

Turner, J. D. and Zhan, W., 'Property rights and competing for the affections of demos: The impact of the 1867 Reform Act on stock prices', *Public Choice*, 150 (2012), pp. 609-31.

Turner, J. D., Ye, Q. and Zhan, W. "Why do firms pay dividends?: Evidence from an early and unregulated capital market", *Review of Finance*, 17 (2013), pp.1787-1826.

Official publications

Return of the Number of Newspaper Stamps at One Penny (P. P. 1852, XLII).

Returns of the Number of Proprietors in Each Railway Company in the United Kingdom (P. P. 1856, CCXXXVIII)
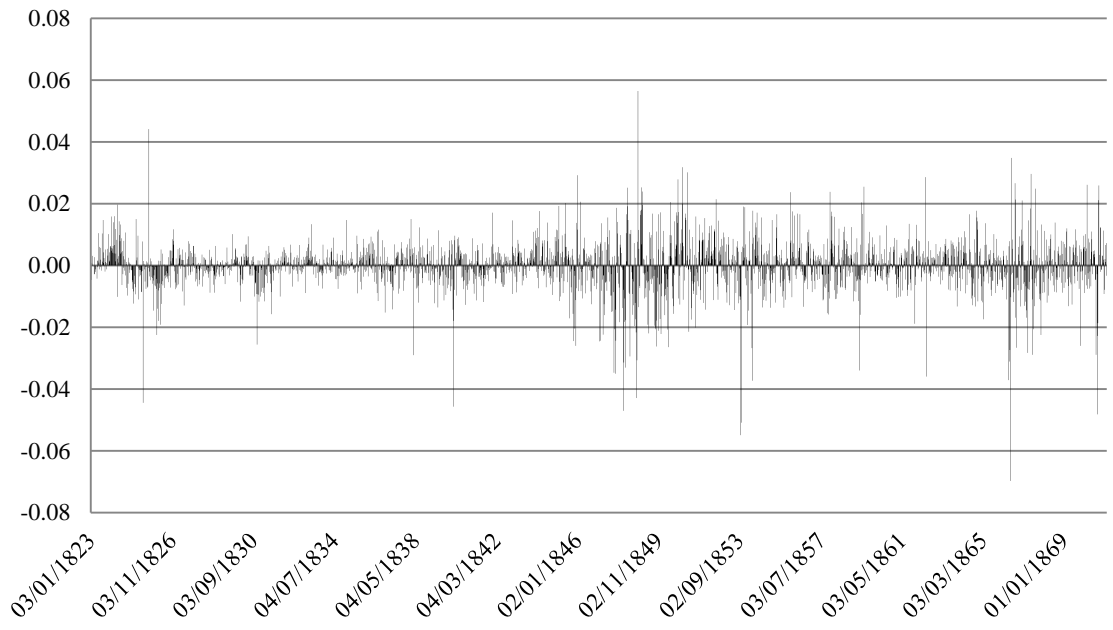
Figure 1. *Equally-Weighted Blue Chip Stock Returns, 1823-70*
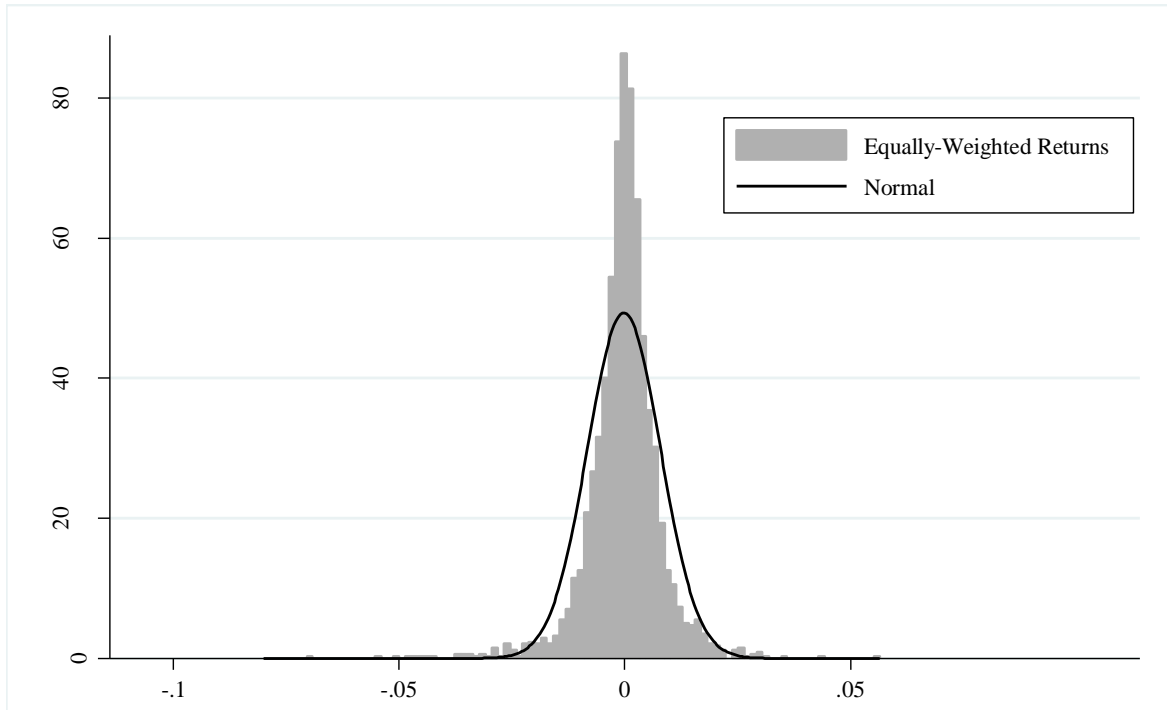
Source: see text.

Figure 2. *Equally-Weighted Returns Distribution, 1823-70*
Source: see text.

Figure 3. *Equally-Weighted and Price-Weighted Returns Indices, 1823-70*
Source: see text.

Table 1. *Constituents of Blue-Chip Stock Index by Industry*

							Industry							
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1823	0	0	16	0	3	0	1	6	0	0	1	0	3	30
1824	0	0	16	0	4	0	1	6	0	0	0	0	3	30
1825	0	0	17	0	2	0	1	6	2	0	0	0	2	30
1826	0	0	17	0	3	0	1	6	0	0	0	0	3	30
1827	0	0	16	1	3	0	1	6	0	0	0	0	3	30
1828	1	0	14	1	4	0	1	6	0	0	1	0	2	30
1829	1	0	14	0	4	0	2	6	0	1	0	0	2	30
1830	1	0	14	0	4	0	2	6	0	1	0	0	2	30
1831	1	0	12	0	4	0	2	7	0	1	1	0	2	30
1832	1	0	12	0	4	0	3	6	0	1	1	0	2	30
1833	1	0	12	0	3	0	3	7	1	1	0	0	2	30
1834	1	1	10	1	3	0	3	7	1	1	0	0	2	30
1835	2	1	10	0	3	0	2	7	1	2	0	0	2	30
1836	4	1	9	0	3	0	1	6	0	4	0	0	2	30
1837	6	1	7	0	3	0	1	6	0	4	0	0	2	30
1838	5	1	8	0	3	0	1	6	0	5	0	0	1	30
1839	4	1	8	0	2	0	1	6	0	6	0	0	2	30
1840	5	1	7	0	2	0	1	6	0	6	0	0	2	30
1841	5	1	5	0	3	0	1	5	0	9	0	0	1	30
1842	5	0	5	0	3	0	1	5	0	10	0	0	1	30
1843	5	0	5	0	3	0	1	5	0	9	0	0	2	30
1844	2	0	4	0	3	0	0	5	0	14	0	0	2	30
1845	2	0	3	0	3	0	0	5	0	15	0	0	2	30
1846	2	0	3	0	3	0	0	4	0	16	0	0	2	30
1847	1	0	2	0	3	0	0	3	0	20	0	0	1	30
1848	1	0	2	0	3	0	0	3	0	21	0	0	1	31
1849	2	0	3	0	3	0	0	3	1	24	0	0	0	36
1850	2	0	1	0	3	0	0	5	0	19	0	0	0	30
1851	4	0	2	0	3	0	0	5	1	15	0	0	0	30
1852	4	0	2	0	3	0	0	5	1	14	0	0	1	30
1853	3	0	1	0	3	0	0	4	0	19	0	0	0	30
1854	5	0	2	0	3	0	0	3	0	17	0	0	0	30
1855	5	0	2	0	3	0	0	2	1	17	0	0	0	30
1856	6	0	2	0	3	0	0	2	1	16	0	0	0	30
1857	6	0	2	0	3	0	0	2	1	16	0	0	0	30
1858	5	0	1	0	3	0	0	3	1	17	0	0	0	30
1859	5	0	1	0	3	0	0	3	1	17	0	0	0	30
1860	6	0	1	0	2	0	0	3	1	17	0	0	0	30
1861	5	0	1	0	2	0	0	3	1	18	0	0	0	30
1862	7	0	1	0	2	0	0	3	1	16	0	0	0	30
1863	8	0	1	0	2	0	1	2	1	15	0	0	0	30
1864	10	0	1	0	2	0	1	1	1	14	0	0	0	30
1865	10	0	1	0	2	0	1	0	1	15	0	0	0	30
1866	10	0	0	0	2	0	1	0	1	16	0	0	0	30
1867	8	0	1	0	2	1	1	1	1	15	0	0	0	30
1868	10	0	0	0	2	0	1	1	1	15	0	0	0	30
1869	9	0	0	0	2	0	1	1	1	14	0	2	0	30
1870	8	0	0	0	2	0	2	1	1	14	0	2	0	30

Notes: 1=Bank; 2=British Mining; 3=Canals; 4=Colonial & Foreign Mines; 5=Docks; 6=Finance; 7=Gas-light & Coke; 8=Insurance; 9=Miscellaneous; 10=Railways; 11=Roads & Bridges; 12=Telegraph; 13=Waterworks.

Table 2. *Summary Statistics of Weekly Stock Returns*

	Mean	*Median*	*Std. dev.*	*Min*	*Max*	*N*
Price-weighted returns	-0.00011	0.00002	0.00652	-0.05621	0.06455	2,504
Equally weighted returns	-0.00019	0.00012	0.00809	-0.06967	0.05654	2,504
Co-movement differential	0.44	0.00	6.59	-22.00	20.00	2,504

Source: see text.

Table 3. *Summary Statistics of First Differences of Fundamental Variables*

Variable	Mean	Std. dev.	Min	Max	N	ADF Test Statistic
ΔBankRate	-0.0006	0.2281	-2.00	2.00	2,504	-39.96***
ΔBank Stock	-0.0054	1.9804	-30.25	12.00	2,504	-53.72***
ΔConsols	0.0051	0.6918	-6.25	4.38	2,504	-51.52***
ΔParis	-0.0161	3.7577	-25.00	20.00	2,489	-49.60***
ΔGold	0.0012	0.2598	-4.50	3.00	2,504	-53.78***
ΔWheat	0.0088	1.5392	-11.00	17.00	2,504	-42.15***
ΔDividends	-0.0037	0.4242	-5.835	9.85	2,503	-67.72***

Source: see text.
Notes: ΔBank Rate is the first difference of Bank Rate; ΔBank Stock is the return on Bank Stock; ΔConsols is the return on Consols; ΔParis is the first difference of the Paris exchange rate; ΔGold is the first difference of the price of gold bars; and ΔWheat is the first difference in the price of wheat; ΔDividends is the change in the average dividend for each company in the index. *** denotes significance at the 1 per cent level. The ADF test statistic has a 1 per cent critical value of -3.43.

Table 4. *Restricted VAR - News and Stock Returns*

Lags in VAR	Bank Rate	Consols Price	Wheat Price	Paris Exchange Rate	Gold Price	Dividend Rate	Bank Stock Price	Ex-Div Firms	Adjusted R^2
Panel A: Coefficients on News Variables - 1823-1870 Weekly Data									
3	-0.0027**	0.0031***	-0.0001	-0.0001	0.0009**	0.0007	0.0003***	-0.0005***	0.0971
	(0.0010)	(0.0004)	(0.0001)	(0.0000)	(0.0004)	(0.0004)	(0.0001)	(0.0002)	
6	-0.0026**	0.0031***	-0.0001	-0.0001	0.0010***	0.0006*	0.0003***	-0.0005***	0.0938
	(0.0010)	(0.0004)	(0.0001)	(0.0000)	(0.0004)	(0.0004)	(0.0001)	(0.0002)	
12	-0.0024**	0.0030***	-0.0001	-0.0001	0.0009***	0.0005	0.0003**	-0.0005**	0.0844
	(0.0010)	(0.0004)	(0.0001)	(0.0000)	(0.0003)	(0.0003)	(0.0001)	(0.0002)	
24	-0.0025**	0.0031***	-0.0002	-0.0001	0.0010***	0.0004	0.0003**	-0.0006***	0.0841
	(0.0011)	(0.0004)	(0.0001)	(0.0001)	(0.0004)	(0.0003)	(0.0001)	(0.0002)	
Panel B: Coefficients on News Variables - 1845-1870, Weekly Data									
3	-0.0018*	0.0047***	-0.0002	-0.0000	0.0008	0.0019**	0.0004**	-0.0005**	0.1399
	(0.0010)	(0.0005)	(0.0002)	(0.0001)	(0.0026)	(0.0007)	(0.0002)	(0.0002)	
6	-0.0019*	0.0046***	-0.0003	-0.0000	0.0023	0.0018**	0.0004**	-0.0005**	0.1272
	(0.0011)	(0.0006)	(0.0002)	(0.0001)	(0.0023)	(0.0007)	(0.0002)	(0.0002)	
12	-0.0016	0.0047***	-0.0002	-0.0000	0.0021	0.0011	0.0004**	-0.0006**	0.1202
	(0.0011)	(0.0006)	(0.0002)	(0.0001)	(0.0029)	(0.0008)	(0.0002)	(0.0003)	
24	-0.0021*	0.0049***	-0.0002	-0.0000	0.0036	0.0011	0.0004*	-0.0008***	0.1117
	(0.0012)	(0.0006)	(0.0002)	(0.0001)	(0.0033)	(0.0008)	(0.0002)	(0.0003)	
Panel C: Coefficients on News Variables - 1823-1870, Monthly Data									
3	-0.0054***	0.0052***	-0.0003	-0.0000**	0.0016	0.0018*	0.0006*	-0.0010***	0.2123
	(0.0019)	(0.0011)	(0.0002)	(0.0000)	(0.0011)	(0.0011)	(0.0003)	(0.0004)	
6	-0.0058***	0.0053***	-0.0004	-0.0000*	0.0020	0.0013	0.0003	-0.0011**	0.1857
	(0.0019)	(0.0012)	(0.0002)	(0.0000)	(0.0014)	(0.0013)	(0.0003)	(0.0005)	
12	-0.0059***	0.0053***	-0.0006**	-0.0000	0.0025	0.0022	0.0002	-0.0011**	0.1679
	(0.0019)	(0.0013)	(0.0003)	(0.0000)	(0.0015)	(0.0017)	(0.0003)	(0.0006)	
24	-0.0061***	0.0048***	-0.0004	-0.0000	0.0048**	0.0033	0.0000	-0.0014**	0.1106
	(0.0022)	(0.0015)	(0.0003)	(0.0000)	(0.0024)	(0.0027)	(0.0003)	(0.0007)	
Panel D: Coefficients on News Variables - 1845-1870, Monthly Data									
3	-0.0049**	0.0075***	-0.0005	-0.0000	-0.0047	0.0051*	0.0005	-0.0012**	0.2686
	(0.0020)	(0.0016)	(0.0003)	(0.0000)	(0.0101)	(0.0030)	(0.0005)	(0.0005)	
6	-0.0062***	0.0078***	-0.0005	-0.0000	-0.0022	0.0044	0.0003	-0.0010	0.2398
	(0.0021)	(0.0019)	(0.0004)	(0.0000)	(0.0136)	(0.0033)	(0.0005)	(0.0007)	

Notes: Regression of blue-chip stock index on news variables generated by vector autoregression of explanatory variables. Newey-West standard errors are in parenthesis. ***, ** and * denote significant at 1 per cent, 5 per cent, and 10 per cent levels respectively.

Table 5. *Unrestricted Regression - News and Share Market Returns*

Panel A: Weekly Data, 1823-1870

	Adjusted R^2		
Lags in specification	*Lagged*	*Lagged and Current*	*Lagged, Current and Lead*
1	0.061	0.162	0.167
3	0.066	0.160	0.164
6	0.075	0.167	0.173
12	0.097	0.180	0.185
24	0.108	0.195	0.202

Panel B: Weekly Data, 1845-1870

	Adjusted R^2		
Lags in specification	*Lagged*	*Lagged and Current*	*Lagged, Current and Lead*
1	0.070	0.220	0.222
3	0.080	0.219	0.221
6	0.099	0.230	0.234
12	0.114	0.239	0.243
24	0.120	0.253	0.261

Panel C: Monthly Data, 1823-1870

	Adjusted R^2		
Lags in specification	*Lagged*	*Lagged and Current*	*Lagged, Current and Lead*
1	0.034	0.269	0.280
3	0.042	0.277	0.288
6	0.077	0.292	0.297
12	0.057	0.270	0.276
24	0.134	0.324	0.320

Panel D: Monthly Data, 1845-1870

	Adjusted R^2		
Lags in specification	*Lagged*	*Lagged and Current*	*Lagged, Current and Lead*
1	0.022	0.329	0.331
3	0.022	0.359	0.360
6	0.019	0.355	0.349
12	-0.005	0.336	0.322
24	0.183	0.367	0.336

Notes: Adjusted R^2 of regressions of blue-chip stock index on explanatory variables.

Table 6. *Coefficients of Variables in Unrestricted Regression with 3 Lags, 1823-1870*

Panel A: Weekly Returns

Lead / Lag	Stock Returns	Δ Bank Rate	Δ Consols	Δ Bank Stock	Δ Paris	Δ Gold Price	Δ Wheat Price	Δ Dividends	ExDiv Firms
+1	-	-0.0012	0.0003	0.0001	-0.00013***	0.0005	-0.0001	-0.0002	-0.0000
	-	(0.0008)	(0.0002)	(0.0001)	(0.0000)	(0.0004)	(0.0001)	(0.0004)	(0.0002)
0	-	-0.0023**	0.0029***	0.0003***	-0.0000	0.0010**	-0.0001	0.0007	-0.0006***
	-	(0.0009)	(0.0003)	(0.0001)	(0.0000)	(0.0004)	(0.0001)	(0.0004)	(0.0002)
-1	0.1189***	-0.0011	0.0014***	0.0001	-0.0000	0.0001	0.0001	0.0004	-0.0002
	(0.0293)	(0.0006)	(0.0002)	(0.0001)	(0.0000)	(0.0003)	(0.0001)	(0.0004)	(0.0002)
-2	0.0757**	0.0002	0.0001	-0.0000	-0.0001	-0.0001	0.0001	0.0006*	-0.0002
	(0.0362)	(0.0008)	(0.0003)	(0.0001)	(0.0000)	(0.0005)	(0.0001)	(0.0003)	(0.0002)
-3	0.0050	0.0007	0.0000	0.0000	-0.0001	0.0001	0.0000	0.0000	0.0000
	(0.0286)	(0.0007)	(0.0003)	(0.0001)	(0.0000)	(0.0003)	(0.0001)	(0.0003)	(0.0002)

Panel B: Monthly Returns

Lead / Lag	Stock Returns	Δ Bank Rate	Δ Consols	Δ Bank Stock	Δ Paris	Δ Gold Price	Δ Wheat Price	Δ Dividends	ExDiv Firms
+1	-	0.0023*	0.0005	0.0005**	-0.000***	-0.0013	-0.0002	0.0016	0.0001
	-	(0.0013)	(0.0009)	(0.0003)	(0.000)	(0.0013)	(0.0002)	(0.0015)	(0.0003)
0	-	-0.0061***	0.0051***	0.0007**	0.000	0.0015	-0.0003*	0.0014	-0.0012***
	-	(0.0018)	(0.0009)	(0.0003)	(0.000)	(0.0012)	(0.0002)	(0.0010)	(0.0003)
-1	0.1037**	0.0018	0.0009	0.0001	-0.000	0.0005	0.0003	-0.0014	-0.0006
	(0.0504)	(0.0020)	(0.0007)	(0.0002)	(0.000)	(0.0010)	(0.0003)	(0.0012)	(0.0005)
-2	0.0634	0.0013	0.0003	0.0002	0.000*	-0.0007	0.0003	0.0008	0.0006
	(0.0516)	(0.0016)	(0.0007)	(0.0002)	(0.000)	(0.0014)	(0.0002)	(0.0013)	(0.0004)
-3	0.0547	0.0027	0.0004	-0.0001	-0.000**	0.0008	-0.0003	-0.0001	0.0005
	(0.0741)	(0.0016)	(0.0007)	(0.0002)	(0.000)	(0.0014)	(0.0002)	(0.0013)	(0.0003)

Notes: Coefficients of regression of blue-chip stock index on explanatory variables with one lead variable and three lags.

Table 7. *Granger Causality Test Results After 24-lag VAR*

Panel A: Null hypothesis: Stock returns do not Granger-cause economic variables

		Chi-Squared	P-value
Equally-Weighted Returns	Consols Price	75.3***	0.000
Equally-Weighted Returns	Wheat Price	42.6**	0.011
Equally-Weighted Returns	Paris Exchange Rate	33.1	0.102
Equally-Weighted Returns	Gold Price	12.2	0.978
Equally-Weighted Returns	Dividend Rate	34.5*	0.075
Equally-Weighted Returns	Bank Stock Price	10.6	0.991
Equally-Weighted Returns	Ex-Div Firms	43.5***	0.009

Panel B: Null hypothesis: Economic variables do not Granger-cause stock returns

		Chi-Squared	P-value
Bank Rate	Equally-Weighted Returns	37.7**	0.037
Consols Price	Equally-Weighted Returns	42.1**	0.013
Wheat Price	Equally-Weighted Returns	28.7	0.233
Paris Exchange Rate	Equally-Weighted Returns	43.3***	0.009
Gold Price	Equally-Weighted Returns	42.34**	0.012
Dividend Rate	Equally-Weighted Returns	35.2*	0.065
Bank Stock Price	Equally-Weighted Returns	20.6	0.665
Ex-Div Firms	Equally-Weighted Returns	47.1***	0.003

Notes: Results of Granger Causality tests after a 24-lag vector autoregression of equally-weighted returns on all other variables. ***, ** and * denote significant at 1 per cent, 5 per cent, and 10 per cent levels respectively.

Table 8. *Large Stock-Market Movements, 1823-1870*

Date	Equally-weighted returns (%)	Return on Consols (%)	Excess returns (%)	News media explanation [categorisation]
10/02/1826	-2.25	-2.66	0.41	Decline in money market attributed to speculators spreading a series of rumours. [F]
17/03/1826	-1.78	-0.96	-0.82	New budget opens and share markets decline in response. [P]
05/11/1830	-2.56	-3.42	0.86	The King's speech is received very unfavourably by the markets because it hints at a more aggressive foreign policy. [P]
16/02/1838	1.51	0.82	0.69	American government reassures Britain of its commitment to protect Canada against rebellions, suggesting Britain will not need to involve itself in the conflict. [P]
30/05/1845	2.03	0.25	1.78	Gains in railway companies attributed to a significant increase in demand for shares rather than any particular news item. [U]
24/10/1845	-2.44	-0.26	-2.18	Prices continue to fall but the press cannot identify any underlying cause. [U]
07/11/1845	-2.04	-1.68	-0.36	Parliamentary debates over the Corn Laws and the railway market is further hit by a high-profile default. [R, P]
28/11/1845	-2.60	-0.65	-1.95	Large business failures reported from Paris, Dublin and provincial markets. [F]
26/12/1845	2.93	0.00	2.93	Lord John Russell, in favour of the repeal of the Corn Laws, is invited to form a government. [P]
12/03/1847	-1.96	-1.80	-0.13	A Newcastle joint-stock bank collapses, resulting in a "scramble for banknotes". [F]
15/10/1847	-3.49	-4.59	1.10	Several east India trading companies collapse. Barclay Brothers and Co. suspended, sparking rumours about the solvency of several other institutions. [F]
03/03/1848	-3.82	-7.06	3.24	French revolution begins. [P]
10/03/1848	-3.14	-1.82	-1.32	French revolution continues and the collapse of *Caisse Gouin* is cited as a catalyst for further price declines. Financial difficulties in Amsterdam and rumours of political upheaval in Germany and Italy. [P, F]
07/04/1848	-3.30	0.31	-3.61	Losses attributed to further disturbances in France. [P]
23/06/1848	-2.94	0.00	-2.94	Railway share market is very depressed with no clear cause. [U]
13/10/1848	-4.29	-1.02	-3.27	Panic in the railway market that later spreads to money market. Jobbers and dealers have their portfolios full of shares and are all sellers. [U]
03/11/1848	5.65	0.73	4.92	Bank of England (BofE) reduces minimum rate of interest. [M]
19/01/1849	2.59	0.98	1.61	Settlement of the account week brings favourable news. [M]
13/12/1850	3.19	0.77	2.42	Gains throughout the week but no clear cause is identified. Bankruptcy of a large investor, Mr. Peter Anderson, is said to add to the buoyancy of the market on Friday. [U]
07/03/1851	3.27	0.39	2.88	Very large volume of trading noted, reports of the public becoming very involved in trading by Friday. South Wales rises considerably 'on the belief that Great Western would support an extension'. [R]
16/07/1852	2.29	0.25	2.04	Settlement of account week brings favourable news. [M]
16/09/1853	-5.17	-1.55	-3.62	Panic induced by disturbances in Russia and Turkey (later the Crimean War) and an anticipated increase in the interest rate by the BofE. [P, M]
30/09/1853	-5.09	-2.77	-2.32	Announcement that British and French fleets are to pass the Dardanelles sparks a panic in the money, share and corn markets. [P]
13/01/1854	-1.93	-3.25	1.32	Allied fleets enter the Black Sea. [P]
24/03/1854	-2.66	-1.93	-0.73	Anglo-French ultimatum is issued demanding Russian withdrawal from Danubian Principalities. [P]

Date	Equally weighted returns (%)	Return on Consols (%)	Excess returns (%)	News media explanation [categorisation]
31/03/1854	-3.83	-3.79	0.04	The previous week's ultimatum is ignored, and Britain and France declare war on Russia. [P]
25/01/1856	2.70	1.12	1.58	Russia enters peace talks and the Czar orders generals to suspend hostilities. [P]
04/12/1857	2.66	0.27	2.39	Markets said to rise in anticipation of minimum discount rate being lowered and an improvement in the position of BofE. [M]
29/04/1859	-3.39	-5.64	2.25	Austria issues ultimatum for immobilisation of the Sardinian army, eventually leading to the Second Italian War of Independence. [P]
03/06/1859	2.05	1.08	0.97	Gains attributed to the "extraordinary ease of the money market" and to a major Austrian defeat. BofE raises the minimum discount rate. [M, P]
15/07/1859	2.56	0.79	1.77	France and Austria unexpectedly sign an armistice followed by a peace treaty. Subsequent "immense rebound" in continental prices. As a result further BofE discount rate decrease is anticipated. [P, M]
06/12/1861	-1.88	-2.56	0.68	Two diplomatic incidents, the Trent and Nashville affairs, invoke pro-Confederate feeling that suggests the possibility of British involvement in the American Civil War. [P]
04/11/1864	1.78	0.28	1.50	Favourable returns from BofE and Bank of France are published. Bank of France reduces the minimum discount rate and it is inferred that BofE will too. [M]
11/05/1866	-3.70	-1.44	-2.26	Overend, Gurney and Co., suspends payments. A panic is sparked by the incendiary comments of the French Emperor and the King of Italy forming volunteer battalions. War is seen as inevitable. [F, P]
25/05/1866	-3.10	-0.72	-2.38	Rumours circulate about the solvency of several joint-stock banks and war grows more likely. [F, P]
31/08/1866	2.63	0.85	1.78	Austria and Prussia sign a peace treaty. An abundance of money and good harvest weather also supports markets. The minimum discount rate is lowered. [P, M]
07/09/1866	2.22	0.28	1.94	Markets continue to rise in response to peace in Europe, good harvest weather and a BofE rate reduction. [P, M, W]
28/09/1866	-2.66	0.28	-2.94	Concerns over Emperor Napoleon's health and Eastern political factors as well as bad weather conditions. [P, W]
04/01/1867	2.11	0.42	1.69	Gains are attributed to "satisfactory character of the revenue returns, the renewed ease in the money market and the continued influx of gold to the bank". [M]
12/04/1867	-2.86	-0.55	-2.31	Luxembourg crisis threatens war between France and Prussia. Diplomatic issues also raise the prospect of a rupture in relations between Britain and Spain. [P]
24/05/1867	1.85	0.81	1.04	Gains due to improved political situation following the Treaty of London and the ease of the money market and the firmness of the exchanges. [P]
07/06/1867	2.97	-0.66	3.63	Bank of France reduces minimum discount rate but this is not sufficient to explain the gains, which are mostly attributed to speculation. [U]
28/06/1867	-2.88	0.66	-3.54	Ongoing solvency problems at London, Brighton and South Coast Railway depress the railway market. [R]
16/08/1867	2.49	0.13	2.36	Fine weather raises the prospect of an abundant harvest. [W]
22/11/1867	-2.25	-0.13	-2.12	Following the 30 per cent fall in London, Brighton and South Coast Railway stock, Caledonian Railway stock price falls 40 per cent in the space of a few weeks. Several others apply to parliament for the right to raise further capital. [R]
22/07/1870	-4.81	-1.63	-3.18	France declares war on Prussia and Franco-Prussian war begins. [P]

Sources: *The Times, The Morning Chronicle,* and *Daily News. Notes*: Excess returns are the difference between the return on Consols and the equally-weighted returns. Key to categorisations: F = financial crisis; M = monetary explanation; P = political; R = railway sector; U = unexplained; W = weather.

Table 9. *Substantial Movement Explanations by Category*

Explanation category	Number of substantial movements	Number of occasions absolute excess return > 1.5%	Average absolute equally weighted returns	Average absolute Consol movement	Average absolute excess return movement
			(%)	(%)	(%)
Political	26	15	2.97	1.75	1.82
Monetary	11	10	2.88	0.68	2.20
Unexplained	6	6	2.97	0.49	2.70
Financial Crisis	7	3	2.89	1.95	1.36
Railways	4	3	2.61	0.72	2.23
Weather	3	3	2.46	0.23	2.41
Total	57	40	2.88	1.39	2.00

Source: see text.

Table 10. *Wars and Share Price Returns*

Conflict start date	Conflict	Return in week t-1(%)	Return in week t (%)	Return in week t+1 (%)
Internal European Conflicts				
20/10/1827	Greek Independence	0.28	0.08	0.64
25/07/1830	First French Insurrection	-0.33	0.17	0.03
25/08/1830	Belgian Independence	0.28	-0.31	0.30
07/02/1831	First Polish	0.16	-0.72	-0.89
01/07/1831	Miguelite War	-0.57	-0.86	-1.57
26/09/1834	Second Murid	-0.34	0.06	-0.09
10/07/1835	First Carlist War	0.03	0.08	0.97
31/10/1835	First Carlist War (France joins)	0.10	0.27	-0.35
15/02/1846	Cracow Revolt	-0.11	2.07	-0.82
13/03/1848	Viennese Revolt	-3.14	-1.81	-1.06
18/03/1848	Milan Five Day Revolt	-1.81	-1.06	-1.76
23/06/1848	Second French Insurrection	-2.94	1.02	1.16
09/09/1848	Hungarian	-1.94	-1.21	0.26
30/04/1849	Roman Republic	-1.91	-0.51	-2.20
16/07/1849	Hungarian (Russia joins)	1.68	-0.44	0.23
22/01/1863	Second Polish	0.32	-0.36	0.01
Inter-State European Conflicts				
07/04/1823	Franco-Spanish War	0.00	-0.42	-0.05
26/04/1828	First Russo-Turkish	-0.01	0.27	-0.17
09/09/1840	Second Syrian, Phase 2	-0.14	-1.28	0.40
24/03/1848	Austro-Sardinian	-1.06	-1.77	-3.30
10/04/1848	First Schleswig-Holstein	-3.30	1.05	1.66
31/03/1854	Crimean	-3.71	0.71	1.77
10/01/1855	Crimean (Italy joins)	-0.12	0.49	0.72
03/05/1859	Italian Unification	-3.39	-1.59	-0.48
01/02/1864	Second Schleswig-Holstein	-0.82	-0.05	0.50
20/06/1866	Seven Weeks	-6.97	-1.03	3.49
19/07/1870	Franco-Prussian	-0.27	-4.81	-2.28
Colonial Skirmishes (UK)				
24/09/1823	First British-Burmese	0.09	-0.12	-0.01
20/01/1824	First British-Ashanti	0.64	1.40	0.40
23/11/1825	British-Bharatpuran	-0.04	-0.59	-0.40
17/04/1838	First British-Zulu	0.59	-0.07	-0.26
14/02/1839	First British-Afghan	0.62	-0.11	-0.49
04/09/1839	First Opium	-0.13	-1.12	0.33
06/01/1843	British-Sind	0.30	-0.36	0.58
28/12/1843	Gwalior	0.11	0.72	1.13
13/12/1845	First British-Sikh	-0.73	-0.04	2.93
16/04/1846	First British-Xhosa	-0.03	0.54	0.50
18/05/1848	Second British-Sikh	1.92	1.47	-0.03
20/10/1849	Chinese Pirates	-2.11	1.67	0.53
24/12/1850	Second British-Xhosa	0.74	-1.11	0.63
05/04/1852	Second British-Burmese	0.08	0.07	0.31
22/10/1856	Second Opium	-0.42	0.48	0.42
25/10/1856	Anglo-Persian	0.48	0.42	1.08
10/05/1857	Indian Mutiny	0.29	0.33	0.05
01/03/1862	Taiping Rebellion, Phase 2	0.20	0.07	0.29
04/06/1863	British-Maori	0.86	0.37	-0.04
25/06/1863	Shimonoseki War	0.04	0.50	0.25
20/10/1863	British Umbeyla Campaign	-0.13	0.55	0.28
05/07/1864	Shimonoseki War	-0.25	1.66	0.52

Table 10. *Wars and Share Price Returns* (cont.)

	Colonial Skirmishes (Other)			
23/07/1825	Dutch – Javanese	-0.51	-0.04	-0.75
28/09/1826	Russo-Persian	0.49	-0.71	0.49
12/06/1830	French Occupation of Algiers	0.28	-0.01	0.07
01/11/1839	First Franco-Algerian	0.03	-0.73	-0.41
06/08/1844	Franco-Moroccan	0.47	-0.24	-1.70
12/04/1848	First Dutch-Bali	-3.30	1.05	1.66
17/05/1856	French Conquest of Kabylia	-0.10	1.69	0.06
31/08/1858	First Franco-Vietnamese	0.38	-0.78	0.79
20/02/1859	Netherlands-Bone	0.44	-0.85	-0.50
16/04/1862	Franco-Mexican	0.10	0.39	-0.06
24/04/1864	Russian-Kokand	0.42	0.92	-0.89
12/01/1866	Russian-Bukharan	0.17	-0.44	-0.48
	Wars in Americas			
25/04/1846	Mexican-American	0.50	0.91	0.14
10/04/1861	U.S. Civil War	-1.00	0.41	0.33

Source: Sarkees et al., *Resort to War.*

Table 11. *Bank Rate Changes and Share Price Returns*

Date	Bank Rate Change (%)	Return in week t-1(%)	Return in week t (%)	Return in week t+1(%)
Bank Rate Increases				
29/10/1847	2	-2.43	1.87	0.10
16/11/1860	1.5	-0.04	-0.13	-0.06
06/11/1863	2	0.28	-0.19	-0.81
04/12/1863	2	0.62	-1.33	-0.73
06/05/1864	2	0.92	-0.89	0.16
06/10/1865	1.5	-0.20	-0.88	0.86
11/05/1866	2	-0.02	-3.70	0.62
29/07/1870	1.5	-4.81	-2.28	-1.86
Bank Rate Decreases				
06/09/1844	-1.5	-0.39	0.56	-0.34
25/12/1857	-2	0.55	1.75	0.81
08/01/1858	-2	0.81	1.60	0.40
17/08/1866	-2	-1.18	-0.76	0.14

Source: Clapham, *Bank of England*

Table 12. *Financial Crises and Share Price Returns*

Date of Crisis	Return in week t-1(%)	Return in week t (%)	Return in week t+1(%)
14/12/1825	-1.46	-0.48	-0.32
14/11/1836	0.59	-0.65	-1.52
21/10/1847	-3.49	-2.43	1.87
08/10/1857	0.19	-0.58	-1.54
09/11/1857	-0.27	-1.58	0.12
10/05/1866	-0.02	-3.70	0.62

Source: Turner, *Banking in Crisis*

Appendix Table 1. *Constituent Companies of Blue-Chip Stock Index*

Company	Industry	Year(s) in index
Agra & Mastermans	Bank	1865
Agra & United Service Ltd	Bank	1861-1864
Anglo Austrian	Bank	1869
Bank of Australasia	Bank	1839, 1841-1842, 1844, 1852-1859, 1863, 1865
British North American	Bank	1850-1851, 1855
Colonial	Bank	1839-1840
Consolidated ltd	Bank	1863-1864
Imperial Ottoman	Bank	1868-1869
Liverpool	Bank	1836-1837
London & County	Bank	1864-1869
London & Westminster	Bank	1834-1869
London Joint Stock	Bank	1838-1842, 1848-1851, 1853-1869
Manchester	Bank	1835-1837
Manchester & Liverpool	Bank	1835-1838
National	Bank	1864-1868
National Provincial of England	Bank	1861-1869
New South Wales	Bank	1866-1868
Northern & Central Bank of England	Bank	1836
Oriental Bank Corporation	Bank	1853, 1856-1869
Provincial of Ireland	Bank	1827-1843, 1845, 1850-1851, 1860-1863, 1867
Union of Australia	Bank	1840-1842, 1852-1860, 1862-1865, 1867
Union of London	Bank	1854-1856, 1859, 1861-1869
British Iron	British mines	1833-1840
Ashton & Oldham	Canal	1825
Birmingham	Canal	1845-1864, 1866
Coventry	Canal	1825-1832
Danube & Mayne	Canal	1837-1838
Ellesmere & Chester	Canal	1825-1829
Forth & Clyde	Canal	1825-1842
Gr& Junction-canal	Canal	1825-1845, 1848
Kennet & Avon	Canal	1825-1839
Lancaster	Canal	1825-1827
Leeds & Liverpool	Canal	1825-1848, 1850-1851, 1853-1856
Loughborough	Canal	1826
Mersey & Irwell	Canal	1825-1829
Monmouthshire	Canal	1825-1834
Oxford	Canal	1825-1843
Peak Forest	Canal	1825-1826
Regent's	Canal	1825-1832
Rochdale	Canal	1825-1839
Stafford & Worcester	Canal	1825-1835
Trent & Mersey	Canal	1825-1844
Worchester & Birmingham	Canal	1825, 1828-1835
Rel del Monte	Colonial mines	1826-1827, 1833
East & West India	Docks	1840-1869
East India	Docks	1825-1831
London	Docks	1825-1863

Company	Industry	Year(s) in index
London & St Katharine	Docks	1864-1869
St. Katharine	Docks	1827-1858
West India	Docks	1825-1837
National Discount Company	Finance	1866
Imperial	Gas-light & coke	1831-1834, 1869
Imperial Continental	Gas-light & coke	1862-1869
Phoenix	Gas-light & coke	1828-1833
Westminster Chartered	Gas-light & coke	1825-1842
Alliance British & Foreign	Insurance	1825-1853
British Fire	Insurance	1826-1842
Globe	Insurance	1825-1852
Guardian	Insurance	1825-1839, 1843-1845, 1849-1851
Indemnity Marine	Insurance	1857-1862
London (ship)	Insurance	1825-1834
Rock Life	Insurance	1825, 1830, 1832-1844, 1848-1861
Royal Exchange	Insurance	1825-1863, 1866-1869
Canada Co / Canada Land	Miscellaneous	1832-1834
Peninsular & Oriental Steam	Miscellaneous	1854-1869
Royal Mail Steam	Miscellaneous	1850-1851
Birkenhead, Lanc. & Cheshire	Railways	1851-1854
Birmingham & Gloucester	Railways	1844-1846
Birmingham & Oxford	Railways	1848-1849
Bristol & Exeter	Railways	1843-1861
Caledonian	Railways	1846-1848, 1852-1869
East Lancashire	Railways	1847-1849, 1852-1858
Eastern Counties	Railways	1845-1849, 1857-1861
Edinburgh & Glasgow	Railways	1841-1848, 1852, 1859-1863
Glasgow & South-Western	Railways	1852-1855, 1857-1869
Grand Junction	Railways	1835-1845
Great Eastern	Railways	1862-1869
Great North of England	Railways	1844-1849
Great Northern	Railways	1847-1869
Great South & Western	Railways	1848-1850, 1856
Great Western	Railways	1836-1869
Hull & Selby	Railways	1845-1850
Lancashire & Yorkshire	Railways	1847-1869
Lancaster & Carlisle	Railways	1846-1859
Liverpool & Manchester	Railways	1828-1844
London & North Western	Railways	1846-1869
London & Birmingham	Railways	1834-1845
London & Brighton	Railways	1840-1846
London & Greenwich	Railways	1835
London & South Western	Railways	1847-1869
London & Southampton	Railways	1837
London, Brighton & South Coast	Railways	1847-1848, 1851-1869
Manchester & Birmingham	Railways	1840, 1843-1845
Manchester & Leeds	Railways	1838-1846
Manchester, Sheffield & Lincolnshire	Railways	1848, 1860-1861, 1864-1869
Metropolitan	Railways	1864-1869
Metropolitan District	Railways	1865

Company	Industry	Year(s) in index
Midland	Railways	1844-1869
Midland Counties	Railways	1840-1841, 1843
Newcastle & Berwick	Railways	1846
Newcastle & Carlisle	Railways	1850-1851
Newcastle & Darlington Junction	Railways	1844
Norfolk	Railways	1846
North British	Railways	1846-1849, 1860
North Eastern-Berwick	Railways	1854-1869
North Midland	Railways	1838-1843, 1845
North Staffordshire	Railways	1846-1867
North Union	Railways	1845-1849
Northern & Eastern	Railways	1843
South Wales	Railways	1850-1859
South-Eastern	Railways	1849-1869
South-Eastern & Dover	Railways	1843-1844
Stockton & Darlington	Railways	1860, 1862
Wilts, Somerset & Weymouth	Railways	1850
Windsor, Staines & South Western	Railways	1849
York & North Midland	Railways	1841-1848, 1852
York, Newcastle, & Berwick	Railways	1849-1848, 1852-1853
Commercial	Road	1827, 1830-1831
Electric (& International)	Telegraph	1868-1869
Submarine	Telegraph	1868-1869
East London	Waterworks	1825-1836, 1838-1839, 1842-1845, 1851
Grand Junction	Waterworks	1825-1826
West Middlesex	Waterworks	1825-1847