

The Realized Rate of Return to 703 UK Home and Foreign Equity, Preference and Debenture Securities, 1870-1913: Data Sources, Description and Excel Instructions

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Introduction

The origins of these data go back more than 40 years. During 1967-1968 I spent six months in the Colindale annex of the British Museum in London, copying from contemporary finance periodicals the prices, dividends and coupon rates of 703 equity, preference, and debenture shares traded on the London stock exchange and several provincial exchanges during the years, 1869-1913. The main source was The Investors Monthly Manual but extensive use was made of Burdett's Official Intelligence and The Stock Exchange Official Intelligence. Each security had its own data sheet.

Returning to the University of Pennsylvania where I was working on my economic history dissertation, the security prices, dividends and coupon rates were then turned into realized returns using a Friden calculator and, in turn, aggregated into a variety of sectoral and geographic averages. These averages then formed the basis for my dissertation and several early publications.¹ Occasionally, I received enquiries from economic and financial historians for the realized rates of return of some or all of the 703 securities. As long as it was a short list, I sent copies of my original data sheets. Interest in the full set ended when I noted that the data were not arrayed in a spread sheet-ready data file. Of late, however, a dozen or so enquiries from finance professors, as well as economic and financial historians, have led me to turn the original 703 data sheets into Excel files. Funding for my excellent research assistants, Doris Chen and Luz Salas, was generously supplied by Queens College and The Graduate School, respectively. My colleague, Cara Marshall, generously shared her Excel programming skills.

Selection and Composition of the Rate of Return Data Base

The process of selecting the data base for the rate of return indices started with the formulation of several rough criteria. The selection criteria which were chosen were based on the goal of constructing indices which could approximate the signals of the

¹ Edelstein (1970, 1976, 1982).

underlying economic performance and prospects of long term financial capital. Realized rate of return indices constructed from high class securities were likely to be the best approximation of this type of economic indicator. Thus, the task of formulating selection criteria became a search for an operational definition of high class securities.

By common usage, a high class security is defined as a debt or equity instrument issued by a company or government with the most secure reputation as a market borrower. Since there was no regular market rating service during the period, 1870-1913, minimal criteria had to be formulated to define the relevant population.

First, an acceptable equity share would be one which either paid dividends regularly or manifested dividend behavior similar to the securities of other leading companies in the same industrial grouping. Thus, failure to pay dividends for short periods was insufficient grounds for automatic exclusion from the indices. On the other hand, defaulted coupon payments were immediate grounds for seriously questioning a debenture's acceptability. At the very least, the affected portion of the debenture's yield history would be excluded from the indices.

Second, securities which underwent long periods of heavy price discount for any reason other than coupon or dividend non-payment were either excluded from the indices or the affected portion of the security's yield history was eliminated. The definition of heavy price discount was taken to be a condition of extreme low price, relative to other securities in the same industrial or governmental grouping.

Third, the selected securities would be those which were frequently quoted over long periods of time.

The studies of R. L. Nash (1880), A. W. Flux (1910), and K. C. Smith and G. W. Horne (1934), were consulted for further guidance on the problems connected with selecting high class securities. Nash's volume is perhaps the first systematic study of rates of return on financial capital traded on the London Stock Exchange. Published in 1880, it assembles data on the important home and foreign securities, 1870-1880. Flux's work is an attempt to study the yields on high class debentures of home and foreign railways and governments over the years 1896 to 1910. His coverage of home and colonial railways and corporations, and colonial and provincial governments is quite extensive but it is not very discriminating. The purpose of the Smith and Horne study was to construct a price index of high class home equity securities for the pre-1914 period. Smith and Horne's methods of selection rested on much the same criteria mentioned above, a high and fairly consistent reputation if such information was available, regular dividend payment (or rare periods of heavy, relative discount), and frequent quotation over long periods.

Applying these criteria to the lists of Nash and Flux, and rechecking the selections of Smith and Horne, a preliminary list of securities was constructed covering home corporations, home railways, home finance, home industry and commerce, colonial corporations, colonial and provincial governments, and Indian railways. With the help of

Burdett's Official Intelligence, The Stock Exchange Official Intelligence, and The Investors Monthly Manual, more securities were added to these categories to fill out the time segments or categories which were depleted by our rejections, and to increase the coverage in some categories to the full time span, 1869-1913. Finally, a number of categories were added and securities were chosen using the two annuals and The Investors Monthly Manual, the latter, our principal source for price and dividend information. The significant additions to the list of included securities were the securities of private overseas (colonial and foreign) railway and utility corporations. Finally, David Chambers of Oxford was kind enough to share with me his revisions of my UK railway data which added the Taff Vale line and valuable data on several stock splits.

Scope and Limitations

It is quite important to note the limitations of these data. First, the Excel data files only contain realized rates of returns; they do not contain the price, dividend or coupon information. Perhaps at some later date, these too will be added, but for the present only the nominal, realized rates of return are here presented.

Second, please note that my dissertation and subsequent research excluded the foreign government debentures (except French *rentes*). Foreign government debentures were a substantial presence on the London Stock Exchange. Also excluded were overseas land and mining companies, with the exception of Indian and Ceylonese tea and coffee shares. Limited time and funding were a significant reason for leaving out the foreign government debentures but, as with the overseas land and mining shares, many of these shares could not be considered first or second class securities. Note, the returns to the 703 securities presented here do include 123 UK and British Empire national government, provincial and municipal debentures.

Measures of Realized Returns

Realized returns are here measured from December of the previous year to December of the listed year. The December issues of The Investor's Monthly Manual are the source of each year's market price, dividends, and interest.

Let P_{it} = the price of the i^{th} security in December of the t^{th} year .

$P_{i,t-1}$ = the price of the i^{th} security in December of the $(t-1)^{\text{th}}$ year.

D_t = the dividend (interest coupon, etc.) of the i^{th} security paid over the t^{th} year.

The Index of Realized Rates of Return can be calculated as

$$\text{IRRR} = [(P_{it} - P_{i,t-1}) + D_t] / P_{i,t-1} + 1.$$

Any capital gain, capital loss and dividends between December of the previous year and December of this year are incorporated in the Index. Typically, this index will range from .7500 to 1.4000. Importantly, this index will not take negative or zero values.

If the IRRR is transformed in the following manner,

$$RRR = 100 \times (IRRR - 1),$$

it takes the more recognizable form of a percentage rate of wealth accumulation. For example, if the IRRR = 1.0578, the RRR = 5.78%.

The advantage of the IRRR is that since it never takes a negative or zero value it permits the calculation of a geometric mean. The geometric mean is, of course, the compounded realized rate of return where all dividends, coupons, etc. are reinvested.

The Sectoral and Time Composition of the Data Base

A quick summary of the data set is presented in Table A1 where summary counts for security type and political divisions are tabulated. A more extensive accounting can be found in Table A2 where the data base is divided by security type, economic sector, sub-sector, country-colony, total number, and number present at 1870, 1880, 1890, 1900, 1910, and 1913.

A careful reader will see slight differences between the counts here and the counts in the earlier publications. For the most part, *mea culpa*. Computers are simply more accurate when tabulating large data sets. Other than my counting errors, the principal additions are the Taff Vale data and the two City of London land companies.

How to Use Microsoft Excel's Filtering Features

Given the size of the data set, many users may want to focus on certain securities and hide the data that they do not require.

1. Begin by clicking on cell A5 (the row that contains the data headings).

2. To turn on Auto Filter:

In Excel 2003:

From the Data menu, choose Filter → AutoFilter.

In Excel 2007:

Click the Data tab and click the Filter button.

3. To apply the filter:

Notice a drop down arrow next to each of the column headers. You can click on this arrow to expand the menu and select the data that you would like to include/exclude from your study.

When you click OK, data that meets the checked criteria will be seen. You will notice that certain rows are hidden, and therefore the row numbers may not be consecutive.

In this dataset, you may filter using several different criteria (country, sector, sub-sector, type, etc.).

At this point, you can select and copy the visible data into a new file.

4. To clear a filter:

In Excel 2003: simply select the drop down arrow next to the appropriate header and select: "All."

In Excel 2007: simply select the drop down arrow next to the appropriate header and select: "clear filter."

5. To turn AutoFilter off:

In Excel 2003:
From the Data menu, choose Filter → AutoFilter.

In Excel 2007:
Click the Data tab and click the Filter button.

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Table A1. Security Type and Political Distribution of 703 Securities

	UK	Empire	Foreign	Mixed	Total
Equity	188	52	71	9	320
Preference	34				
Debenture	142	94	105	8	349
Total	364	146	176	17	703

Note: The mixed category is largely made up of telegraph companies which directly connected Britain with both colonies and independent foreign countries, noted in the main table as "Global." However, these firms should not be treated as the only multi-national companies in the listings. To ferret out the multi-nationals in the data base is a serious project and one left for future research.

Table A2. Security Data Base by Type, Sector, Sub-Sector, Country/Colony, Number												
Security					Country/		Number of Securities					
Type	Sector	Sub-Sector	Country/	Colony	Total	1870	1880	1890	1900	1910	1913	
EQ	SO	RAILWAYS	UK		17	17	17	17	17	17	17	
EQ	FIN	BANKING	UK		19	16	18	17	16	15	14	
EQ	FIN	INSURANCE	UK		14	12	14	14	14	13	12	
EQ	LI&C	TEXTILES (xOCS)	UK		13	3	5	5	10	12	13	
EQ	LI&C	TEXTILES-OCS	UK		11		10	8	11	11	11	
EQ	LI&C	FOOD	UK		7			3	6	7	7	
EQ	LI&C	DRINK	UK		7	1	1	5	7	7	6	
EQ	LI&C	RETAIL STORES	UK		5				4	5	5	
EQ	HI	IRON COAL STEEL	UK		18	6	11	11	15	18	18	
EQ	HI	ICS & HEAVY FABRICATION	UK		7	2	3	4	6	7	7	
EQ	HI	MECH EQPT	UK		14	6	8	9	11	10	12	
EQ	HI	ELEC EQPT	UK		3	1	1	1	3	3	3	
EQ	HI	BLDG & CSTR MAT	UK		4		2	3	2	3	3	
EQ	HI	CHEMICALS	UK		7	2	2	5	4	6	6	
EQ	SO	ELECTRICITY	UK		3			1	2	3	3	
EQ	SO	GAS	UK		5	3	5	5	5	5	5	
EQ	SO	WATER	UK		7	6	7	7	7			
EQ	SO	CANALS & DOCKS	UK		7	5	7	7	6	4	4	
EQ	SO	SHIPPING	UK		11	8	8	10	10	8	7	
EQ	SO	TEL & TEL	UK		4	1	2	2	3	2	1	
EQ	SO	URBAN LAND	UK		2	2	2	2	2	2	2	
EQ	SO	URBAN TRANSPORT	UK		3	1	3	3	2	2	1	
EQUITY: TOTAL DOMESTIC					188	92	126	139	163	160	157	
EQ	SO	RAILWAYS	INDIA		11	6	7	7	8	8	8	
EQ	SO	RAILWAYS	CANADA		2	1	1	1	1	1	1	
EQ	SO	RAILWAYS	BELGIUM		3	3	3	2	1			
EQ	SO	RAILWAYS	FRANCE		6	5	6	5	4	3	1	
EQ	SO	RAILWAYS	HOLLAND		1	1	1	1				
EQ	SO	RAILWAYS	ITALY		1	1	1	1	1			
EQ	SO	RAILWAYS	AUSTRIA		2	1	1	2	2	2	2	
EQ	SO	RAILWAYS	RUSSIA		2	1	2	2				
EQ	SO	RAILWAYS	USA		10	3	4	6	9	9	9	
EQ	SO	RAILWAYS	ARGENTINA		4	2	2	2	3	4	4	
EQ	SO	RAILWAYS	BRAZIL		5	3	4	4	4	3	3	
EQ	SO	RAILWAYS	CHILE		1			1	1	1	1	
EQ	SO	RAILWAYS	MEXICO		1	1	1	1	1	1	1	
EQ	FIN	BANKING	S & E ASIA		2	2	2	1	1	1	1	
EQ	FIN	BANKING	HONG KONG-CHINA		1	1	1	1	1	1	1	
EQ	FIN	BANKING	INDIA		1	1	1	1				
EQ	FIN	BANKING	AUSTRALIA		6	6	6	6	3	3	3	
EQ	FIN	BANKING	NEW ZEALAND		3	2	3	3	2	2	2	
EQ	FIN	BANKING	CANADA		1	1	1	1	1	1	1	
EQ	FIN	BANKING	SOUTH AFRICA		1	1	1	1	1	1	1	
EQ	FIN	BANKING	E MEDITERRANEAN		4	4	4	4	4	4	4	
EQ	FIN	BANKING	S AMERICAN		3	2	2	2	3	3	3	

Security		Sub-Sector	Country/ Colony	Total	Number of Securities					
Type	Sector				1870	1880	1890	1900	1910	1913
EQ	SO	ELECTRICITY	INDIA	2					2	2
EQ	SO	ELECTRICITY	CANADA	2					2	2
EQ	SO	ELECTRICITY	ARGENTINA	1					1	1
EQ	SO	ELECTRICITY	MEXICO	1					1	1
EQ	SO	GAS	INDIA	2	2	2	2	2	2	2
EQ	SO	GAS	CHINA	1	1	1	1	1	1	1
EQ	SO	GAS	S AFRICA	1				1	1	1
EQ	SO	GAS	ITALY	1				1	1	1
EQ	SO	GAS	W EUROPE	3	2	3	3	3	3	3
EQ	SO	GAS	ARGENTINA	2			1	1	1	1
EQ	SO	GAS	BRAZIL	3	2	3	2	1	1	
EQ	SO	GAS	URUGUAY	1		1	1	1	1	1
EQ	SO	TEL & TEL	GLOBAL	4		3	4	3	3	3
EQ	SO	TEL & TEL	INDIA	2	1	1	2	2	2	2
EQ	SO	TEL & TEL	USA	3		2	2	2	3	3
EQ	SO	TEL & TEL	ARGENTINA	1			1	1	1	1
EQ	SO	TEL & TEL	BRAZIL	1		1	1			
EQ	SO	TEL & TEL	CARRIBEAN	1		1	1	1	1	1
EQ	SO	TEL & TEL	CHILE	1				1	1	1
EQ	SO	TEL & TEL	CUBA	1		1	1	1	1	1
EQ	SO	TEL & TEL	ASIA-AUSTRALIA	1		1	1	1	1	1
EQ	SO	URBAN TRANSPORT	INDIA	1			1	1	1	1
EQ	SO	URBAN TRANSPORT	GERMANY	1			1			
EQ	SO	URBAN TRANSPORT	PORTUGAL	1					1	1
EQ	SO	URBAN TRANSPORT	SPAIN	2		1	2	2	2	1
EQ	SO	URBAN TRANSPORT	ARGENTINA	2		2	2	2	1	1
EQ	SO	URBAN TRANSPORT	BRAZIL	2	1	1	1		1	
EQ	SO	URBAN TRANSPORT	MEXICO	1					1	1
EQ	AG	TEA & COFFEE	CEYLON	3			1	3	2	2
EQ	AG	TEA & COFFEE	INDIA	11	2	5	6	10	10	10
EQ	AG	TEA & COFFEE	INDIA-CEYLON	2				2	2	2
EQUITY: TOTAL NON-DOMESTIC				132	59	83	92	94	99	94
PR	SO	RAILWAYS	UK	18	6	7	7	8	8	8
PR	HI	ICS&HF	UK	3				1	3	3
PR	HI	BLDG & CONSTR MAT	UK	2					2	2
PR	HI	CHEMICALS	UK	1					1	1
PR	LI&C	DRINK	UK	8		1	2	6	8	7
PR	LI&C	FOOD	UK	1				1	1	
PR	LI&C	MISC	UK	1					1	1
PREFERENCE: TOTAL DOMESTIC				34	6	8	9	16	24	22
DB	GOV	NATIONAL	UK	3	1	1	1	1	1	1
DB	GOV	MUNICIPALS	UK	45	5	11	26	36	36	34
DB	SO	RAILWAYS	UK	29	16	21	19	15	15	15
DB	LI&C	TEXTILES	UK	6				5	5	5
DB	LI&C	FOOD	UK	5			1	4	5	5

Security		Sub-Sector	Country/ Colony	Total	Number of Securities					
Type	Sector				1870	1880	1890	1900	1910	1913
DB	LI&C	DRINK	UK	7			2	6	7	7
DB	LI&C	RETAIL STORES	UK	2				2	2	2
DB	LI&C	MISC-HOTELS	UK	3				3	3	3
DB	LI&C	MISC-FOOD	UK	1				1	1	1
DB	HI	ICS&HF	UK	7				2	7	6
DB	HI	ELEC EQPT	UK	2				1	1	1
DB	HI	BLDG & CONSTR MAT	UK	1					1	1
DB	HI	CHEMICALS	UK	4				1	4	4
DB	SO	ELECTRICITY	UK	3				2	3	3
DB	SO	GAS	UK	10		2	5	5	5	5
DB	SO	WATER	UK	4			2	4		
DB	SO	CANALS & DOCKS	UK	5		1	4	4	2	2
DB	SO	SHIPPING	UK	2				1	2	2
DB	SO	TEL & TEL	UK	1				1	1	1
DB	SO	URBAN TRANSPORT	UK	2			1		1	1
DEBENTURES: TOTAL DOMESTIC				142	22	36	61	94	102	99
DB	GOV	NATIONAL	FRANCE	1	1	1	1	1	1	1
DB	GOV	COLONIAL & PROVINCIAL	INDIA	5	2	2	3	3	2	2
DB	GOV	COLONIAL & PROVINCIAL	CEYLON	1				1	1	1
DB	GOV	COLONIAL & PROVINCIAL	AUSTRALIA	21	4	9	14	17	13	13
DB	GOV	COLONIAL & PROVINCIAL	NEW ZEALAND	4	2	2	3	4	3	2
DB	GOV	COLONIAL & PROVINCIAL	CANADA	10	2	4	6	8	6	6
DB	GOV	COLONIAL & PROVINCIAL	JAMAICA	1				1	1	1
DB	GOV	COLONIAL & PROVINCIAL	S AFRICA	10	2	4	5	8	8	8
DB	GOV	COLONIAL MUNCIPALS	AUSTRALIA	6		1	3	5	5	5
DB	GOV	COLONIAL MUNCIPALS	CANADA	11		3	6	9	8	8
DB	GOV	COLONIAL MUNCIPALS	NEW ZEALAND	5		3	4	4	3	2
DB	GOV	COLONIAL MUNCIPALS	S AFRICA	1				1	1	1
DB	SO	RAILWAYS	INDIA	10	1	4	4	5	9	9
DB	SO	RAILWAYS	CANADA	7		3	5	7	5	4
DB	SO	RAILWAYS	BELGIUM	2	2	2	2	2	2	
DB	SO	RAILWAYS	FRANCE	7	4	6	6	2	2	2
DB	SO	RAILWAYS	ITALY	3	1	2	2	3	3	3
DB	SO	RAILWAYS	LUXEMBOURGH	1	1	1				
DB	SO	RAILWAYS	SPAIN	1		1	1	1		
DB	SO	RAILWAYS	SWEDEN	1			1	1	1	1
DB	SO	RAILWAYS	AUSTRIA	1	1	1	1	1	1	1
DB	SO	RAILWAYS	RUSSIA	7	4	7	3	1	1	
DB	SO	RAILWAYS	USA	51	1	14	30	38	28	26
DB	SO	RAILWAYS	ARGENTINA	9		1	1	6	6	5
DB	SO	RAILWAYS	BRAZIL	2		1	2	2	2	2
DB	SO	RAILWAYS	CHILE	1				1	1	1
DB	SO	RAILWAYS	CUBA	1				1	1	1
DB	SO	RAILWAYS	MEXICO	2			1	2	2	2
DB	SO	RAILWAYS	PANAMA	1	1	1	1			
DB	SO	ELECTRICITY	ARGENTINA	1					1	1
DB	SO	ELECTRICITY	BRAZIL	1					1	1

Security		Sub-Sector	Country/ Colony	Total	Number of Securities					
Type	Sector				1870	1880	1890	1900	1910	1913
DB	SO	ELECTRICITY	MEXICO	2					2	2
DB	SO	ELECTRICITY	NEW ZEALAND	1					1	1
DB	SO	ELECTRICITY	PORTUGAL	1					1	1
DB	SO	GAS	ARGENTINA	1					1	1
DB	SO	GAS	S AFRICA	1				1		
DB	SO	GAS	W EUROPE	1				1	1	1
DB	SO	TEL & TEL	GLOBAL	7			4	4	3	2
DB	SO	TEL & TEL	INDIA	1					1	1
DB	SO	TEL & TEL	ARGENTINA	2				1	1	1
DB	SO	TEL & TEL	USA	1		1	1			
DB	SO	URBAN TRANSPORT	INDIA	1					1	1
DB	SO	URBAN TRANSPORT	ARGENTINA	1		1	1	1		
DB	SO	URBAN TRANSPORT	MEXICO	1					1	
DB	SO	URBAN TRANSPORT	SPAIN	1			1	1		
DEBENTURES: TOTAL NON-DOMESTIC				207	29	75	112	144	131	120
TOTAL				703	208	328	413	511	516	492
AG = agriculture										
Bldg & Constr Mat = building and construction materials										
FIN = finance										
GOV = government										
HVI = heavy industry										
ICS&HF = iron, coal steel and heavy fabrication										
LTI&CM = light industry and commerce										
SO = social overhead capital (public utilities)										
Tel & Tel = telephone and telegraph										
Textiles-OCP = Oldham cotton spinners										
DB = debentures (bonds)										
EQ = equity (common) shares										
PR = preference shares										