Economically irrational pricing of 19th century British government bonds

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Outline:

- British economy, finance, institutions
- British financial markets
- Gilts (British government bonds) pricing anomalies
Origins of modern corporate capitalism:

Corporate capitalism was invented in nineteenth-century Britain; most of the market institutions that we take for granted today – limited [liability] companies, shares, stock markets, accountants, financial newspapers – were Victorian creations. So were the moral codes, the behavioural assumptions, the rules of thumb and the unspoken agreements that made this market structure work.

Paul Johnson, *Making the Market*, 2010
Britain post-1815:

- victorious in Napoleonic wars
- financial system widely credited for victory
- saddled with crushing national debt

- interesting issues, still inadequately explored so far: liquidity traps, fiscal repression, extensive corruption, flowering of the Industrial Revolution, ...

- British railway mania of the mid-1830s: equivalent to about $2,000 billion of real capital investment for U.S. today as fraction of GDP
- British Railway Mania of the mid- and late-1840s: equivalent to about $4,000 billion
- Mania of the 1860s: equivalent to about $2,000 billion (mostly in railways)
- Mania of the mid-1830s: the only episode in history of gigantic and wildly speculative frenzy that was successful
British economy and national debt, 1840–1880:

<table>
<thead>
<tr>
<th>year</th>
<th>GDP</th>
<th>debt</th>
<th>CA</th>
<th>RA</th>
<th>NR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1840</td>
<td>566</td>
<td>798</td>
<td>362.2</td>
<td>126.1</td>
<td>-</td>
</tr>
<tr>
<td>1850</td>
<td>593</td>
<td>798</td>
<td>374.2</td>
<td>121.3</td>
<td>247.8</td>
</tr>
<tr>
<td>1860</td>
<td>828</td>
<td>802</td>
<td>400.6</td>
<td>115.0</td>
<td>246.2</td>
</tr>
<tr>
<td>1870</td>
<td>1153</td>
<td>748</td>
<td>393.6</td>
<td>102.7</td>
<td>220.1</td>
</tr>
<tr>
<td>1880</td>
<td>1379</td>
<td>738</td>
<td>390.9</td>
<td>92.3</td>
<td>204.2</td>
</tr>
</tbody>
</table>

All figures in millions of pounds sterling.
Consols (CA) overpricing, 1823–1887:

Consols overpricing, 1823 – 1887

Consols yield (%)

CAm* – RA*

year

Consols overpricing, 1823–1887

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Major gilts (CA, RA, NR):

- primarily book entry securities, at Bank of England
- perpetual, could be redeemed at par by government, could not be cashed in by investors

Consols (CA) and RA: from 1750s to 1888–89

NR: from 1844 to 1888

3% rate (1.5% twice a year) (with NR at 3.25% in 1844–54)
London Stock Exchange (LSE) and gilts:

- established to trade gilts
- around 1820, gilts about 2/3 of world’s tradeable securities
- in mid-19th century, about 1,000 members (brokers, jobbers, speculators)
- quite sophisticated (options, ...), but poorly documented
Major gilts at LSE:

- quoted in units of £100.00
- cash settlement (only CA available for “account”)
- standard broker commission and jobber “turn” (bid-ask spread) each £0.125
- no taxes, transfer fees, ...
- shares very different: only for bi-weekly “account,” high commission, high spread, transfer fees, stamp tax of about 0.5%, ...
Major gilts:

- interest ("dividends") paid 5 Jan. and 5 July for CA, 5 April and 10 Oct. (later 5 Oct.) for RA and NR
- prices quoted with accrued interest
- expect CA approximately £0.75 below RA in Jan.–March, £0.75 above in April–June, ...
- known to be a "good enough" approximation to contemporaries
- $\text{CA}_m = \text{CA} \text{ "for money," } \text{CA}_m^* = \text{CA}_m \text{ minus accrued interest, } \text{CA}_m^* - \text{RA}_m^* = \text{difference } \text{CA}_m \text{ and RA plus or minus 0.75}$. 

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Consols (CA) overpricing, 1823–1887:

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Economically irrational pricing of 19th
Increase in Consols overpricing, 1864:

Consols overpricing in 1864

CA - RA, adjusted for accrued interest

Consols yield (%)

(BoE discount rate, %)/2

CAm* - RA*
- almost all newspapers carried gilts prices
- mostly very unsophisticated investors
- development of financial journalism and financial analysis
- technology limitations: “pigeon expresses,” ...
- very high quality data at Bank of England, almost completely unexplored
Redemption rules and market realities:

- large size of major gilts forced strategic bargaining: in 1844 conversion, investors got 2–3% over par; in the Goschen 1888 conversion, about 1%

- legal rules: CA and RA required 1-year notice, NR could be redeemed immediately

- in Goschen 1888 conversion, CA and RA investors received £0.25 more than NR holders
Lowe conversion proposal of 1870:

Robert Lowe and gilts mispricing

trading days, Nov. 1869 – March 1870
Contemporary reactions to Consols overpricing:

- wide recognition of anomaly: “the public mind has been sorely puzzled ...” (newspaper, 1860)
- several long campaigns by newspapers alerting readers to arbitrage opportunity
- acceptance (from 1872 textbook on arithmetic): “the price of [RA and NR] ought therefore to be always the same, but ought to differ from that of [CA] either in excess or defect by [£0.75]: but owing to the comparative scarcity of [CA] on the Stock Exchange, their price is adventitiously higher than that of [NR and RA].”
Theoretically it may be said a stock of one or two hundred millions must be as easily dealt in as a larger one. But the fact is different. The jobbers prefer the larger article, and the stock of [£390 million] is preferred to the smaller though still bulky competitors.

*Economist*, 19 February 1870
Liquidity excuse inadequate:

- many long-term investors (especially trusts)
- jobber quotes binding for £1,000
- prices not affected by deals for tens of thousands of pounds
- average size of account around £3,000
- bid-ask spread occasionally wider by £0.125 for RA and NR than for CA
Heterogeneous beliefs: Post Office Savings Bank customer investments in gilts, 22 Nov. 1880 to 31 March 1881:

<table>
<thead>
<tr>
<th>gilt</th>
<th>number of investments</th>
<th>aggregate investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>3,202</td>
<td>£173,133</td>
</tr>
<tr>
<td>RA</td>
<td>481</td>
<td>26,301</td>
</tr>
<tr>
<td>NR</td>
<td>3,291</td>
<td>187,309</td>
</tr>
</tbody>
</table>
More information: papers and data

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or just google/bing “odlyzko”