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CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

INTERNAL TRADE BRANCH

INDEX NUMBERS OF DOMINION OF CANADA LONG TERM BOND YIELDS

(1926 = 100)

1919 - 1935

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DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS - CANADA
INTERNAL TRADE BRANCH

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INDEX NUMBERS OF DOMINION OF CANADA LONG-TERM BOND YIELDS

Fluctuations of bond yields may be included among the most significant indications of economic change that are susceptible to statistical treatment. As bond yields move, so move the borrowing costs of industrial long-term capital. When yields decline the possibility of business expansion becomes greater, and conversely, when yields rise business expansion becomes less attractive because of higher borrowing costs. The burden of new government long-term loans likewise increases or decreases with the rise or fall of bond yields. Because they are extremely sensitive to financial conditions, bond yields are also a valuable indicator of coming changes in the business situation.

In establishing a reliable basic measurement of bond market fluctuations, it is necessary to eliminate as far as possible the element of risk from the data which are used. This consideration makes high grade government bonds the most dependable indicators of market conditions. In the United Kingdom, Consols have long been the yardstick of bond yield measurements, possessing as they do a minimum of risk and a maximum of liquidity. In Canada, a broad market for Dominion long-term bonds has been a comparatively recent development, following upon the Victory Loan issues of the war period. Prior to that time, however, considerable financing of provincial and municipal loans was handled internally, and reliable records for high grade internal Province of Ontario bonds on a long-term basis are available as far back as 1900. These have been utilized to construct index numbers of bond yields shown on a later page, and it is of note that their fluctuations have paralleled closely those for similar index numbers based upon Dominion long-term issues for the past fifteen years.

The increasing prominence of Dominion financing in the internal market in the past decade has made advisable the creation of a bond yield index based upon long-term Dominion issues. It is logical that they should be considered the most typical for purposes of international comparison, and the broad resources of the Dominion tend to reduce the risk factor in yields of Dominion issues to a minimum. It is not contended that a Dominion long-term index is the most useful for all purposes, but that it may most reasonably be considered as a basic index for the Canadian long-term bond market. Other types of index such as those for shorter term or industrial issues may reveal tendencies which cannot be discerned by reference to the index herewith presented.

DESCRIPTION OF THE DOMINION BUREAU OF STATISTICS LONG-TERM DOMINION BOND YIELD INDEX

Index numbers of bond yields are frequently presented in the form of average yields for a specified list of issues. This procedure has several advantages, the chief being that it reveals at a glance the actual level of yields at any specified time. It is also possible to make secondary calculations from average yields with a greater measure of assurance than when utilizing percentage relatives. This latter form has been chosen by the Bureau, however, because it facilitates comparison with other index series already calculated, such as those for wholesale commodity prices and prices of common stocks.

"Long-term" bonds are defined arbitrarily as issues maturing in not less than seven years. The effect of including issues with a maturity any shorter than this is illustrated by reference to the behaviour of yields for Dominion $4\frac{1}{2}$ s of 1940, in the years 1932 to 1934 inclusive. In 1932 yields for this issue approximated very closely those for other Dominion 4 p.c. and $4\frac{1}{2}$ p.c. issues. In 1933, the yields of $4\frac{1}{2}$ s of 1940 were always just a little lower than other 4 s and $4\frac{1}{2}$ s, and by the end of 1934 they were down to 2.5 p.c., while yields for other similar issues ranged between 3.0 p.c. and 3.5 p.c.. The Dominion $4\frac{1}{2}$ s of 1940 were dropped from the Bureau's index at the beginning of 1933.

Dominion internal long-term bonds have an average maturity of roughly 16 years, as compared with 22 years for Dominion issues which have been made payable in New York, and 45 years for those floated in London. The relatively short life of internal issues has necessitated fairly frequent substitutions in the list of issues included. This list is shown following with issues currently included being marked by an asterisk, and dates of inclusion and deletion noted in brackets.

x	Dominion of Canada	4½ p.c.	1949-1959	(Jan. 1932)
x	Dominion of Canada	4½ p.c.	1948-1958	(Jan. 1932)
x	Dominion of Canada	4 p.c.	1947-1952	(Dec. 1932)
x	Dominion of Canada	4½ p.c.	1946	(Jan. 1926)
x	Dominion of Canada	4½ p.c.	1944	(Jan. 1926)
x	Dominion of Canada	5 p.c.	1943	(Oct. 1923)
	Dominion of Canada	4½ p.c.	1940	(Jan. 1926-Dec. 1932)
	Dominion of Canada	5½ p.c.	1937	(Jan. 1919-Dec. 1925)
	Dominion of Canada	5½ p.c.	1934	(Jan. 1920-Dec. 1926)
	Dominion of Canada	5½ p.c.	1933	(Jan. 1919-Dec. 1925)
	Dominion of Canada	5 p.c.	1931	(Jan. 1919-Oct. 1923)

The limited number of constituents may seem to provide an inadequate basis for an index number series, and would undoubtedly be open to question were it not for the exceptional homogeneity of the data included. Despite the marked fluctuations in yields during the past few years, the yield of no single issue has varied more than 6.5 p.c. from the average of all yields included at any time since 1926. In terms of actual yield this extreme difference amounted to 0.22 points. Such marked similarity of fluctuations is not common in the field of index number construction.

The use of non-taxable issues in years prior to 1926 may also be criticized because of the difference between yields for taxable and non-taxable bonds. The yields on the 5½ p.c. issues of 1934 (non-taxable) and 1937 (taxable), for example, differ on the average by approximately 0.50 or by over 10 p.c. between 1920 and 1926. There is no such wide variation, however, between the relative movements of the yields for these two issues. Separate index numbers for each coincided frequently during the years from 1920 to 1926, and were never more than two points, i.e., about 2 p.c. apart for two consecutive months. Since it was impossible to obtain an adequate representation of non-taxable issues for these earlier years, this similarity of behaviour was considered reasonable justification for employing both types of issues.

The necessity of substituting new issues from time to time has made unavoidable the use of a chain system of calculation. Between periods of substitution, however, the index is calculated in exactly the same manner as a fixed base aggregative formula. Substitutions are effected in the following manner.

Suppose:

The 1926 base aggregate = 500

The index for month S in year 10 = 60.0

The index aggregate in month S before substitution of issues = 300

The index aggregate in month S after substitution of issues = 420

Then the revised base aggregate $= \frac{420 \times 100}{60.0} = 700$

In relation to the revised aggregate of 420 for month S, this new base also gives an index of 60.0 and continuity is thereby maintained.

The Bureau's index of Dominion long-term bond yields is a weighted series, each issue receiving a degree of importance commensurate with the amount of the issues outstanding. Tests have shown, however, that it makes very little difference whether or not weights are used, because of the close relationship between fluctuations of the individual constituents of the index.

COMMENTARY ON CHART 1.

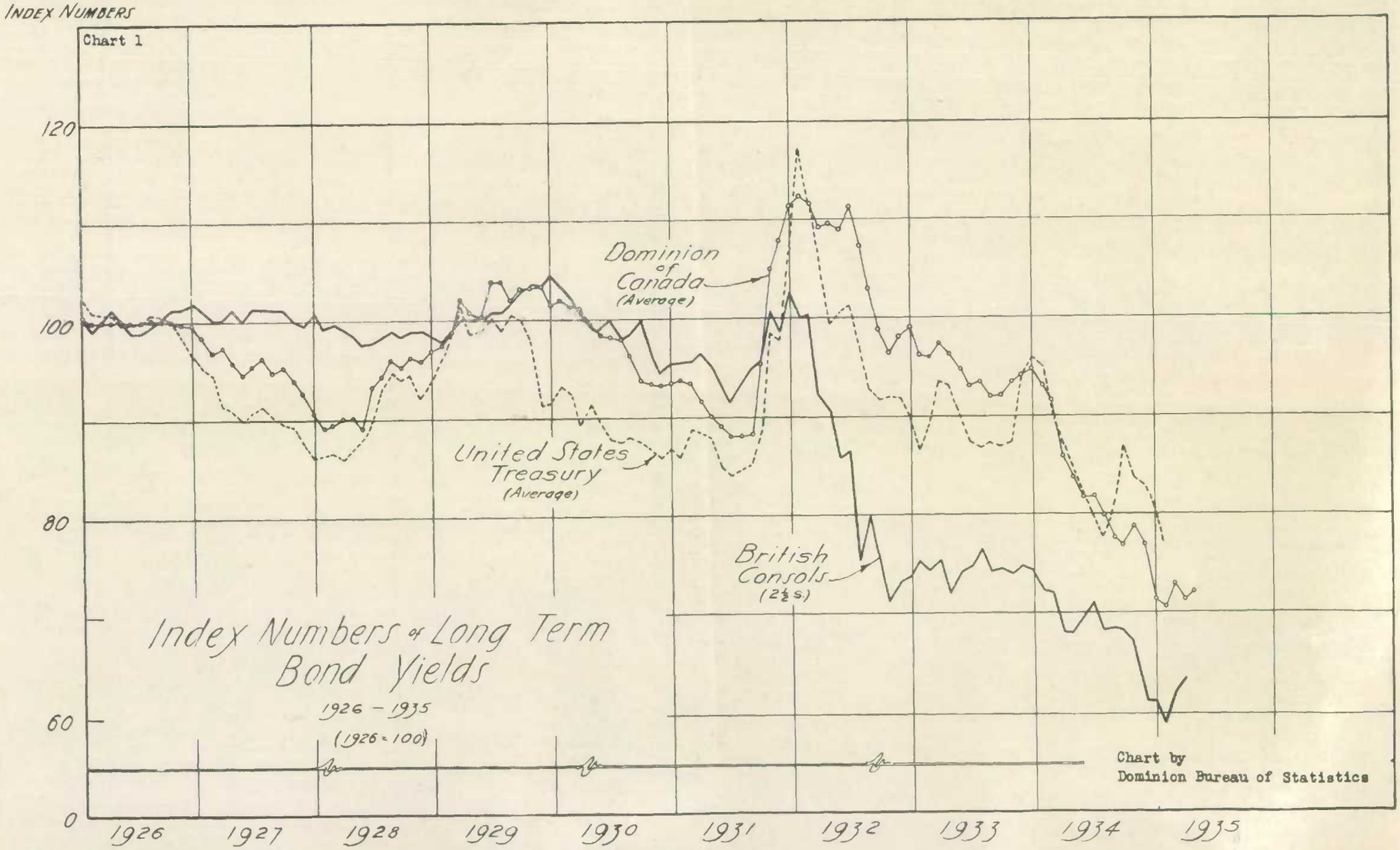
Chart 1 indicates the relative movements of high grade government bond yields in the United Kingdom, United States, and Canada since 1926. Yields have been calculated in terms of the respective currencies of each country and index numbers derived from these yields afford a good indication of changing conditions in the government bond markets represented.

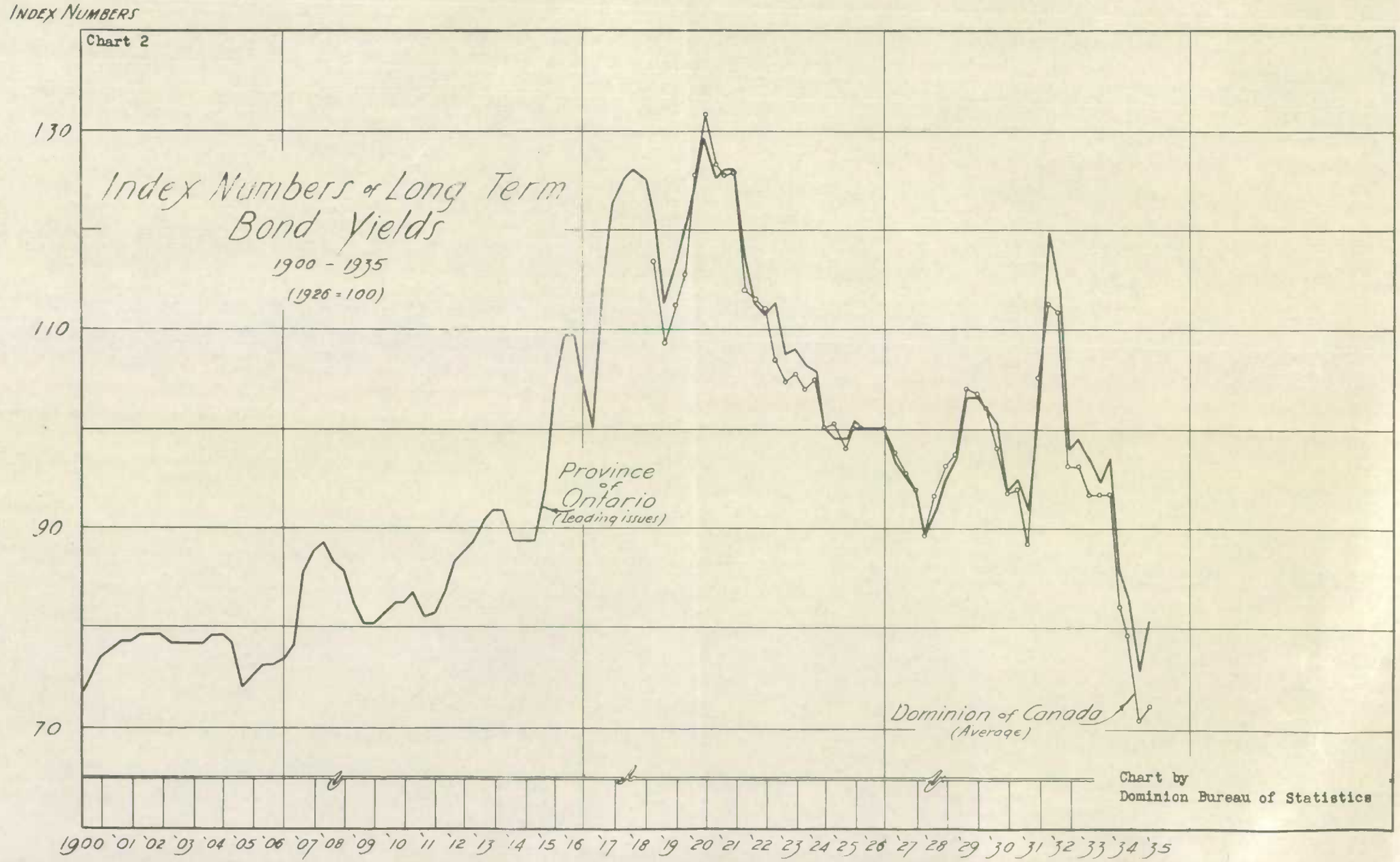
The same broad movements can be discerned in all three series, although frequent short period variations are evident.

COMMENTARY ON CHART 2.

Chart 2 shows index numbers of Province of Ontario long-term bond yields since 1900, and index numbers of Dominion of Canada long-term bond yields since 1919. It is evident at a glance that these two series reveal the same tendencies throughout the greater part of the past sixteen years, and this fact enhances the value of the Ontario index for purposes of earlier historical comparison.

The gradual rise in yields during the years prior to 1913 reflects the demand for capital and the upward tendency in interest rates which prevailed throughout the Dominion during this period. The financial crisis of 1907-8 is shown clearly by the Ontario index. Following its termination, the rise in yields continued and accelerated rapidly in the early war years. A temporary reaction in the latter part of 1916 and the winter of 1917 was attributed to a marked reduction in offerings of municipal bonds which coincided with greater demand from the United States for Canadian securities. With the entry of the United States into the war in April 1917, however, the American market was occupied with its own financial requirements, and Canadian yields again rose abruptly until the latter part of 1918. Then, with the pressure of war financing removed, and a plentiful supply of funds available for the purchase of the limited number of new issues, prices of bonds again rose for a time, and, correspondingly, yields declined. This situation was quickly changed by an abrupt fall in the sterling rate at Montreal during the latter half of 1919, causing British holders of Canadian bonds to offer them on the Canadian market in large quantities, and for a time a state approaching demoralization existed. The severity of this condition is indicated by the Ontario yield index which reached an all time high of 134.7 on December 1920. This compared with the war time high of 126.3 in June 1918, when the burden of war financing reached its peak. The "thawing" of commercial loans and lower call money rates paved the way for a broader bond market in 1921, and yields fell steadily until 1928 when they were on approximately the same levels as in 1913. The speculative boom of 1929 carried money rates and bond yields upward again until the fall months of that year. A subsequent recession was interrupted by the financial crisis of 1931 and 1932, but since June 1932, yields have declined until they are now almost upon a par with those at the beginning of the century.


INDEX NUMBERS
Chart 1
120
100
80
60
0
Dominion of Canada (Average)
United States Treasury (Average)
British Consols (2½s)
Index Numbers of Long Term Bond Yields
1926 – 1935
(1926 = 100)
Chart by Dominion Bureau of Statistics
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935


INDEX NUMBERS
Chart 2
Index Numbers of Long Term Bond Yields
1900 - 1935
(1926 = 100)
130
110
90
70
Province of Ontario
(Leading issues)
Dominion of Canada
(Average)
Chart by
Dominion Bureau of Statistics
1900 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18 '19 '20 '21 '22 '23 '24 '25 '26 '27 '28 '29 '30 '31 '32 '33 '34 '35

INDEX NUMBERS OF DOMINION OF CANADA LONG-TERM BOND YIELDS, 1919-1935.
(1926=100)

	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	117.9	116.7	125.2	113.6	107.0	104.0	100.3	99.9	97.6
February	116.8	117.9	122.3	112.5	104.3	104.2	99.7	99.6	96.5
March	113.5	119.7	123.2	111.7	103.8	104.5	99.8	100.0	97.3
April	111.3	120.9	125.4	111.3	104.0	105.5	100.0	100.1	95.7
May	111.3	122.9	124.0	110.6	104.4	104.9	99.8	100.1	94.6
June	109.7	124.6	125.1	111.8	104.0	104.6	98.5	100.4	95.7
July	111.9	126.6	124.6	111.5	104.0	103.6	99.8	100.0	96.4
August	112.5	128.2	124.7	111.5	104.4	102.5	100.4	100.0	94.7
September	112.7	130.4	124.7	110.7	104.4	101.2	100.4	100.1	95.4
October	113.4	131.8	124.8	111.3	105.7	100.2	100.8	100.1	94.0
November	113.4	134.2	119.4	112.1	106.2	100.2	101.0	100.1	92.8
December	115.4	130.8	116.3	109.6	105.2	100.6	100.1	99.3	90.2

	1928	1929	1930	1931	1932	1933	1934	1935
January	89.2	97.3	102.1	93.9	112.7	96.3	93.2	70.9
February	89.5	98.3	101.4	93.6	112.2	96.0	91.0	73.2
March	90.1	100.3	101.1	91.9	109.1	97.7	86.1	71.4
April	90.3	100.9	99.3	90.0	109.8	96.6	83.8	72.2
May	89.5	100.2	98.4	89.3	109.3	95.0	81.8	-
June	93.3	104.0	98.2	88.3	111.7	93.3	82.1	-
July	94.4	104.0	98.0	88.3	107.5	93.5	80.1	-
August	95.9	102.0	95.9	83.3	100.5	92.2	77.8	-
September	95.2	102.8	93.9	95.5	96.7	92.4	77.2	-
October	96.2	103.7	93.6	105.2	96.2	93.5	79.3	-
November	95.9	103.3	93.6	107.7	98.5	94.3	77.2	-
December	97.1	101.4	93.9	111.7	99.4	95.3	71.3	-

INDEX NUMBERS OF PROVINCE OF ONTARIO LONG-TERM BOND YIELDS, 1900-1935.
(1926=100)

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
January	73.1	77.9	79.3	78.5	78.5	78.5	76.2	78.3	88.7	82.5	81.4	83.5	83.5
April	74.1	78.5	79.3	78.5	78.5	75.2	76.2	81.4	87.7	81.4	82.5	81.0	85.6
June	75.2	78.7	79.3	78.5	79.3	74.1	76.2	85.6	86.6	80.4	82.5	81.0	86.6
October	77.2	78.7	79.3	78.5	79.3	75.2	76.8	87.7	85.6	80.4	82.5	81.4	87.7
December	77.7	79.3	78.5	78.5	78.3	76.2	77.2	88.7	83.5	81.4	83.5	83.5	88.7

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
January	88.7	91.9	88.7	109.6	100.2	125.3	121.1	120.0	125.3	116.9	112.7	106.5
April	89.8	90.8	91.9	110.6	109.6	125.3	116.9	121.1	125.3	112.7	107.5	106.1
June	90.8	88.7	93.9	109.6	114.8	126.3	112.7	125.3	126.3	112.7	107.5	105.8
October	91.9	88.7	104.4	104.4	123.2	125.3	116.9	123.4	126.3	111.7	107.9	100.2
December	91.0	88.7	109.6	102.3	125.3	125.3	120.0	128.4	119.4	113.2	107.3	99.2

	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
January	99.2	100.2	97.1	89.6	97.1	102.3	95.0	119.8	99.2	97.2	76.2
February	100.2	100.2	97.1	87.7	98.1	102.3	95.0	115.9	98.7	96.0	78.3
March	100.2	100.2	96.0	88.7	101.3	101.3	92.9	110.6	100.0	90.1	79.5
April	100.2	100.2	95.2	88.3	103.3	101.3	92.9	111.3	101.3	87.7	80.8
May	99.2	100.2	95.0	90.8	104.4	101.3	91.9	113.2	98.1	84.8	-
June	99.2	100.2	95.0	91.9	103.3	100.3	91.9	114.4	97.1	85.4	-
July	99.2	100.2	95.0	93.9	103.3	100.2	92.9	110.6	96.7	83.1	-
August	99.2	100.2	95.0	95.0	102.3	96.0	91.9	103.3	95.0	82.3	-
September	99.2	100.2	95.0	96.0	104.4	92.9	97.1	101.9	95.8	82.0	-
October	100.2	100.2	93.9	95.0	103.3	93.9	103.3	98.1	94.6	82.9	-
November	100.2	99.2	93.9	95.0	103.3	93.9	105.4	102.3	97.3	81.0	-
December	100.2	99.2	90.8	96.0	102.3	93.9	106.6	102.7	98.5	76.2	-

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