Interest Rates, Deficits and Sub-National Debt

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Key Questions & Definitions

- ***"National" debt*** **is debt issued by a country that controls its money supply**
  - **Has a printing press and can always pay off debt issued in its own currency**
  - **Offset to money printing is inflation: Israel, Argentina, Zimbabwe**
- ***"Sub-national" debt*** **is debt issued by a "country that does not control a printing press:**
  - **Euro crisis in 2011/12 and the PIIGS: Portugal, Italy, Ireland, Greece and Spain all of which had huge debt and deficit problems, but did not control the Euro so they could not inflate their way out of their problems**
  - **Booth, Georgopolous and Hejazi, "What drives provincial-Canada yield spreads"** ***Canadian Journal of Economics*** **40-3 , August 2007. (currently being updated)**

Change in Debt

- **Debt is not an absolute we relate it to income (or cash flow) both for individuals, companies and countries. The logic is identical!**
- **Whether debt as a % of GDP increases or not depends on the *operating deficit* and the interest charges.**
- **The change in debt at time *t* (D_t-D_{t-1}) is simply the operating deficit plus the interest charges on the previous period's debt. The operating deficit *(Deficit)* does not include the interest charges**

$$D_t - D_{t-1} = Deficit + r * D_{t-1}$$

- ***Determinants of a debt crisis?***

Basic Relationship

- **If we take the previous relationship and divide through by the previous period's GDP (P_{t-1})we get**

$$\frac{D_t}{P_{t-1}} - \frac{D_{t-1}}{P_{t-1}} = \frac{Deficit}{P_{t-1}} + \frac{r * D_{t-1}}{P_{t-1}}$$

- **Defining *d* as the debt to GDP ratio, *OD* as the current operating deficit to GDP and *g* as the growth rate in GDP we get**

$$d_t(1+g) - d_{t-1} = OD(1+g) + rd_{t-1}$$

- **Rearranging we get**

$$d_t - d_{t-1} = OD + \frac{(r-g) * d_{t-1}}{(1+g)}$$

This is arithmetic not finance or economics!

Size of the existing debt?

$$d_t - d_{t-1} = OD + \frac{(r-g)*d_{t-1}}{(1+g)}$$

Operating Deficit

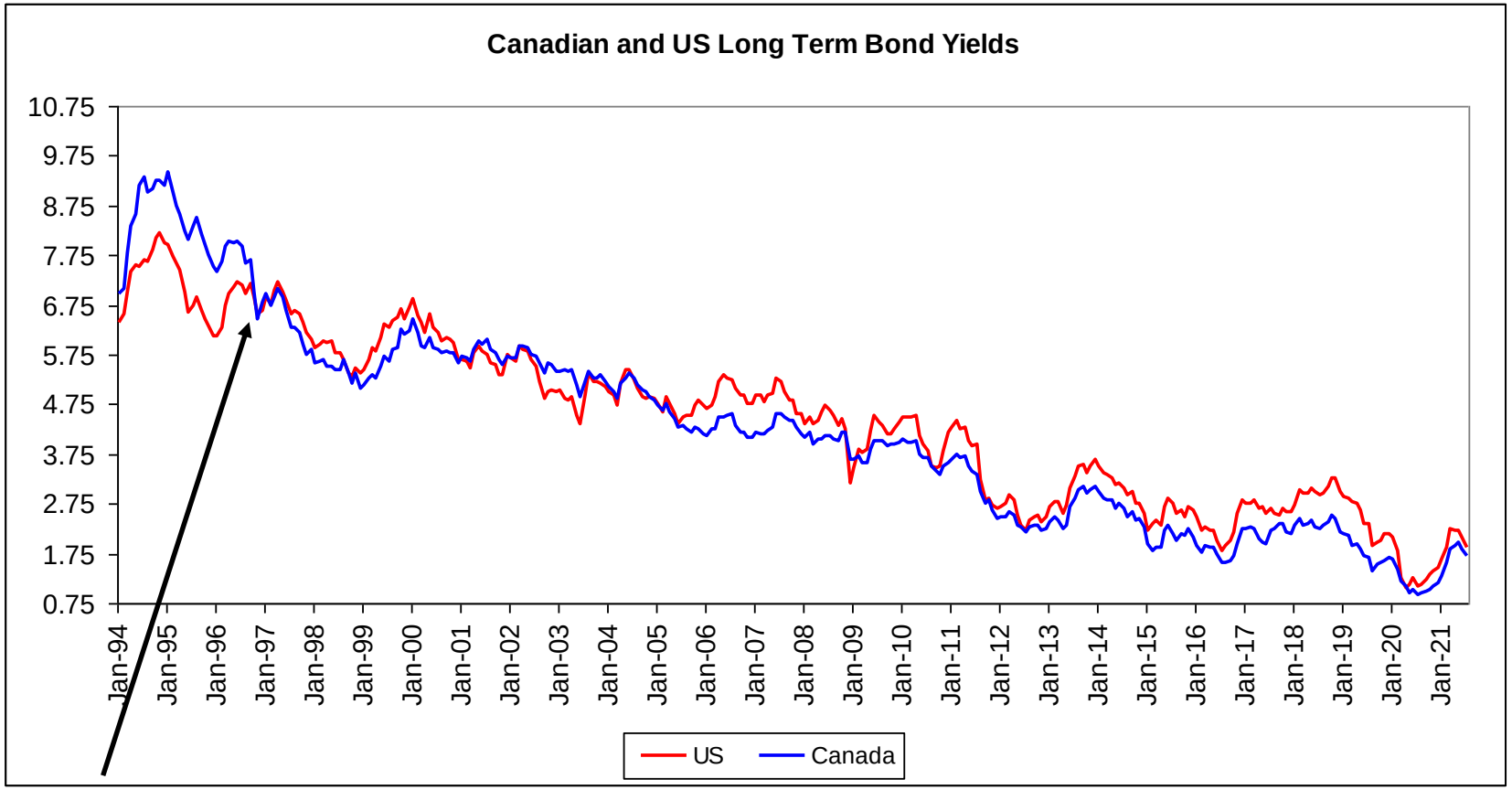
Growth Rate

Interest burden

r-g

Note the interest burden is the real interest rate minus the real GDP (or both nominal values). r<g characterises periods of "financial repression" (1945-1952)

Interest Rate History



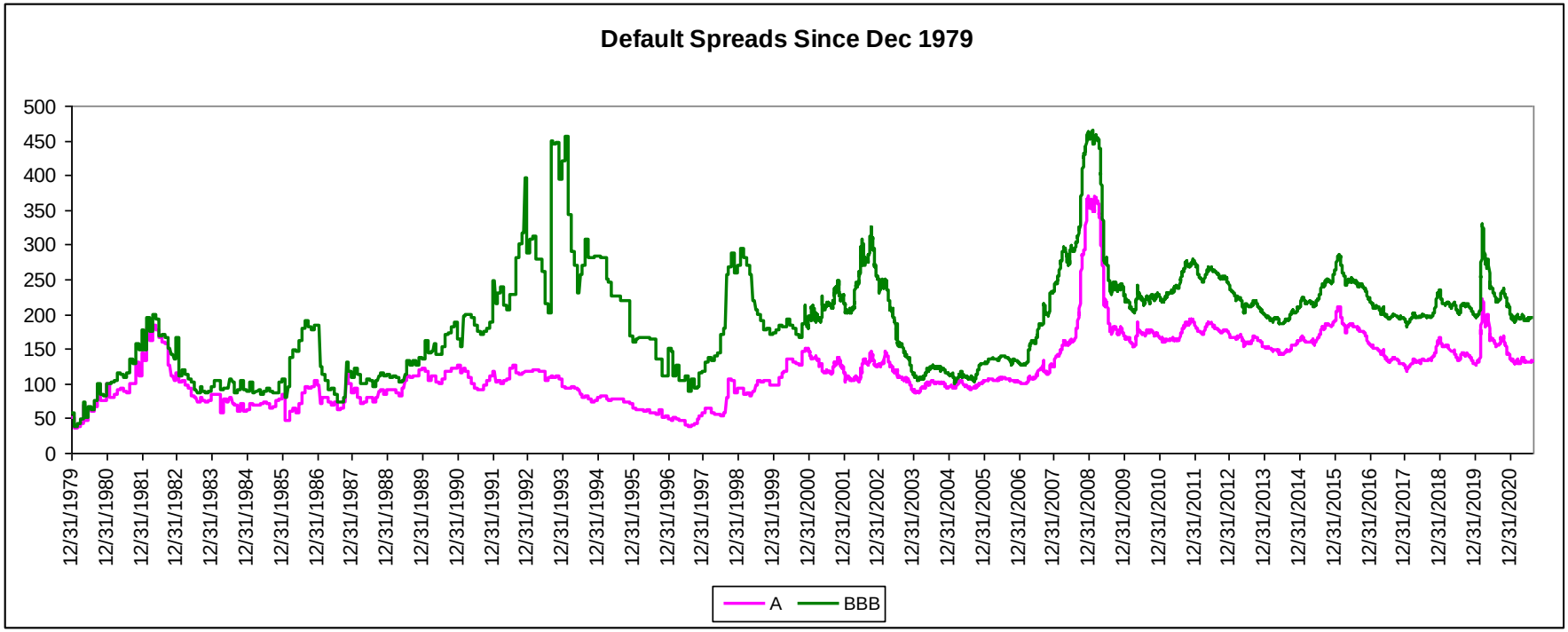
1995 Canadian austerity budget moved Canada into surplus 1997

Since 1998 long Canadas have been 0.31% lower than US Treasuries whereas before they were 1.25% more.

BOOTH: Newfoundland 2021

NFLD is A(S&P), A(low) DBRS, A1 Moody's

All with negative outlook

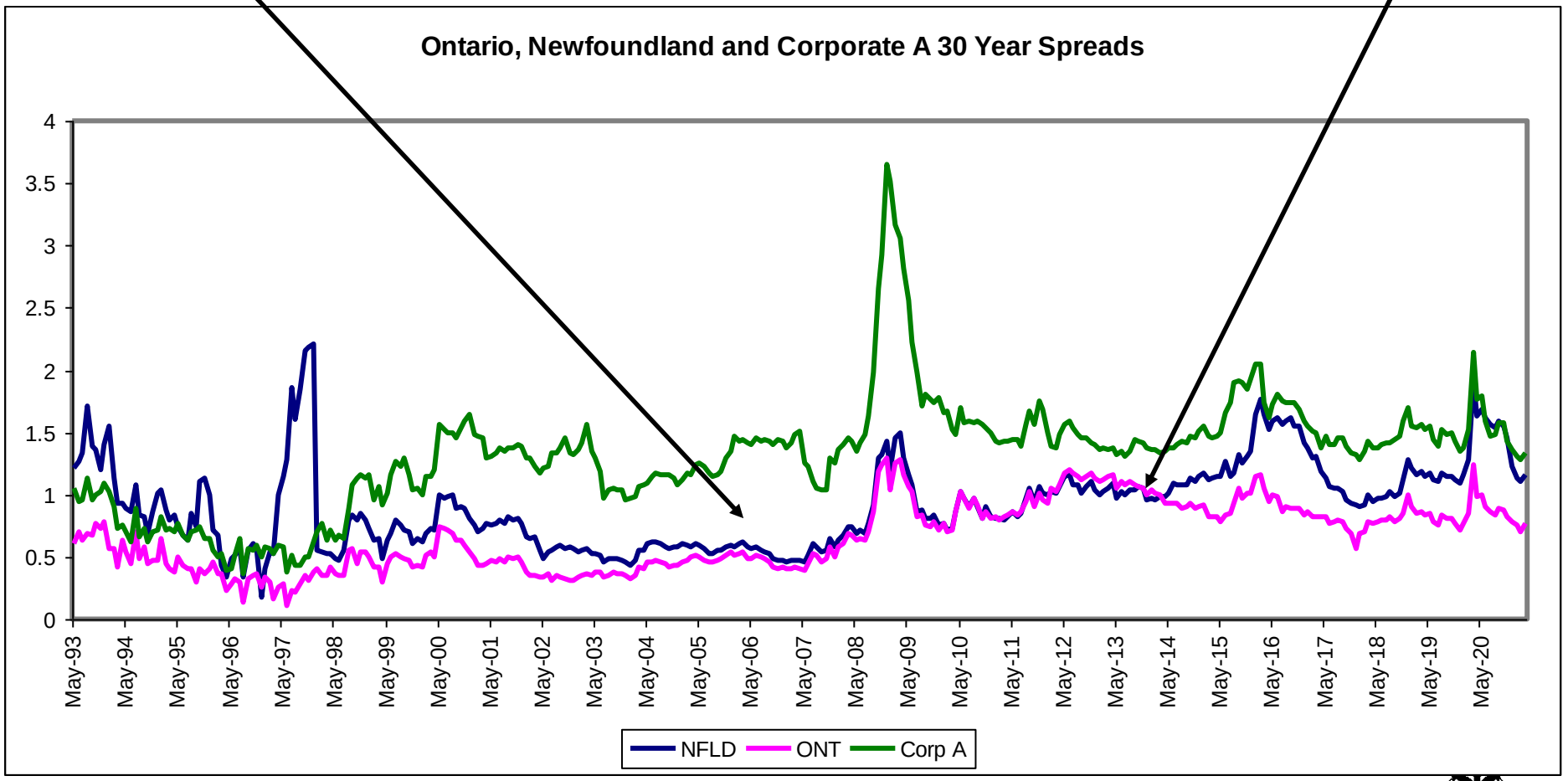


This time around the "flight to quality" from Covid 19 was short lived and not as severe as structural recessions.

Provincial 30-year Spreads

Peak oil prices and production

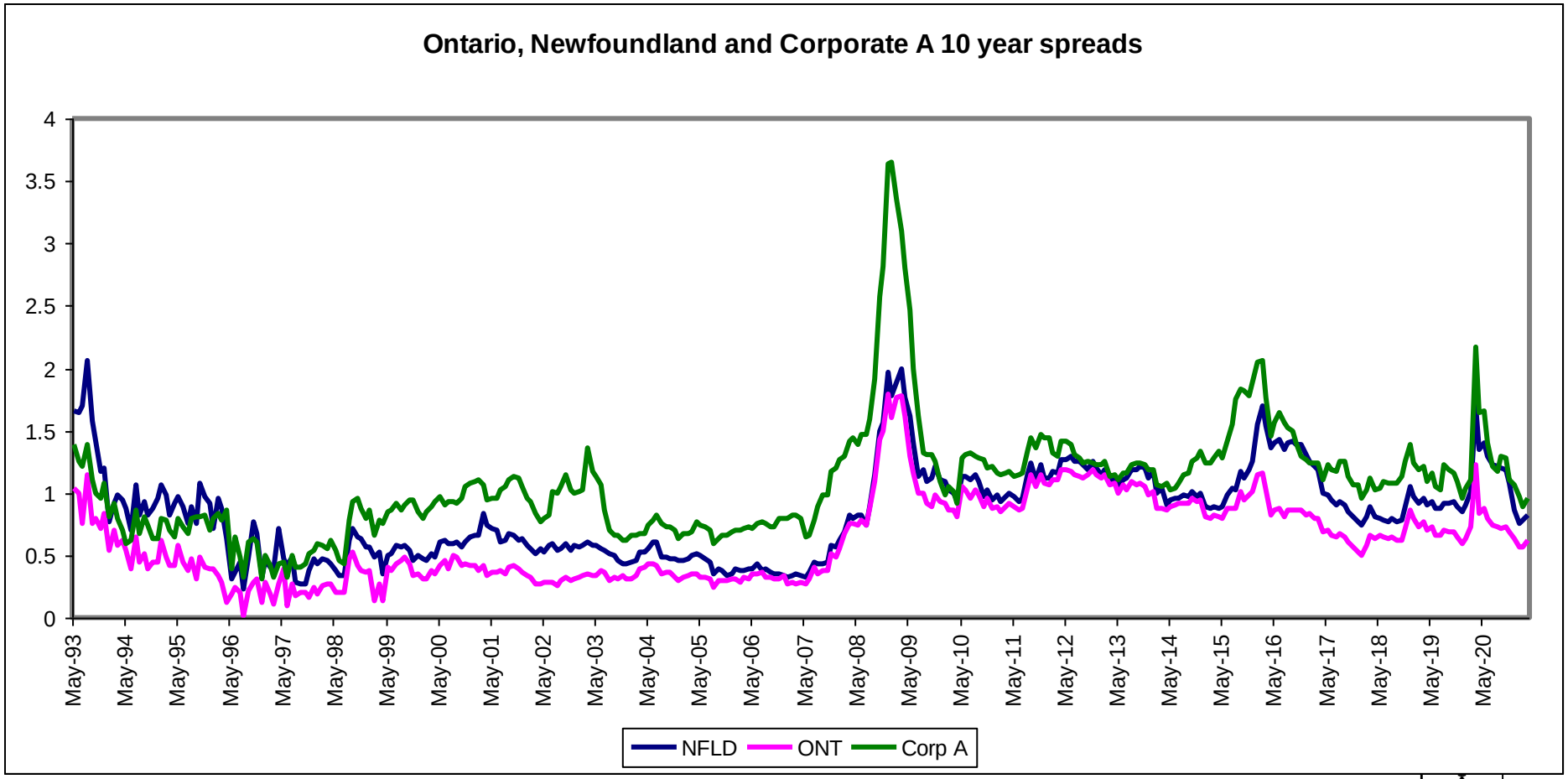
GDP growth slows



Newfoundland's yields in 1997 look like a Bloomberg data error

BOOTH: Newfoundland 2021

Provincial 10-year Spreads



Debt and Deficits (2007 CJE paper)

TABLE 6
GLS estimation in the presence of heteroscedasticity and autocorrelation: independent variables lagged one period

	(1)	(2)	(3)
debt	0.329	0.363	0.385
	(0.006)	(0.002)	(0.001)
deficit	1.500	1.360	1.450
	(0.011)	(0.020)	(0.012)
employ	−0.133	−0.140	−0.130
	(0.006)	(0.003)	(0.005)
open	0.114	0.162	0.121
	(0.567)	(0.401)	(0.528)
extreme[a]	–	0.120	0.109
		(0.011)	(0.020)
			0.150
political[b]	–	–	(0.001)
Test statistic for heterosce-	27.610		
dasticity (null: no hetero)	(0.001)		
Test statistic for	4.710		
autocorrelation (null: no auto)	(0.058)		
Sample size	777	777	777

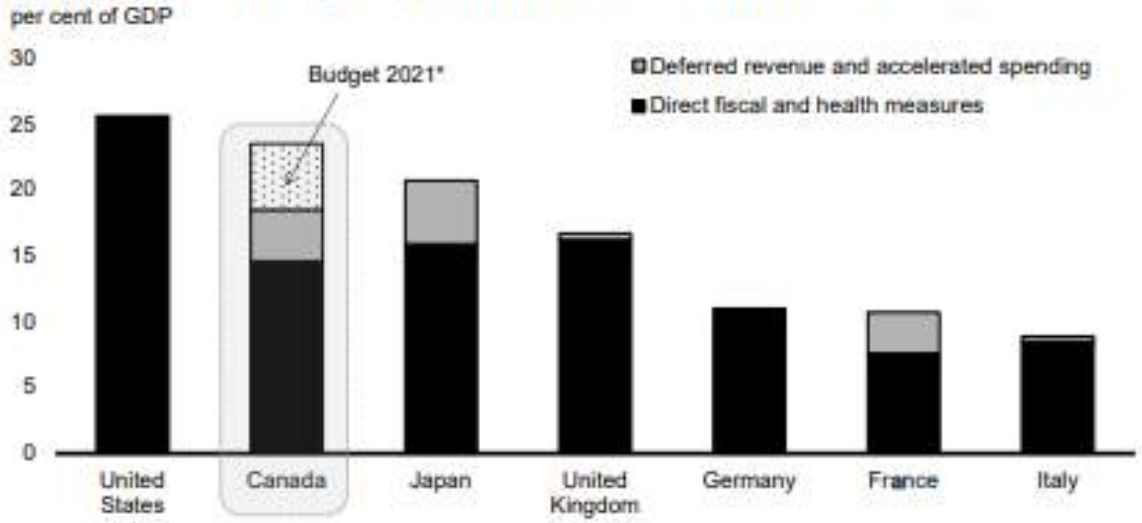
NOTE: p-values are in parentheses.
a Dummy value is 1 if both provincial and federal debt/GDP and deficit/GDP are above average.
b Dummy taking on a value of 1 at 1990Q2, 1992Q3, 1995Q3, 1995Q4.

All values are relative to Canada except extreme.

Covid 19 & Fiscal Policy

Chart 7

Significant Fiscal Policy Support Announced across G7 Countries



Notes: The timeframe for the announced measures is country-specific. Excludes the proposed *American Jobs Plan* for the U.S. (unveiled March 31, 2021) and Germany's supplementary budget for 2021 and Budget 2022 planned net new borrowing (unveiled March 24, 2021).

* Includes commitments made in Chapter 3 of the 2020 *Fall Economic Statement* and policy actions since, including Budget 2021.

Source: International Monetary Fund, April 2021 *Fiscal Monitor*, includes announced measures as at March 17, 2021; Department of Finance Canada calculations.

Covid 19 & Federal Government Borrowing

	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	2020-21 Projected
Domestic bonds[1]	536	576	569	597	915
Treasury bills	137	111	134	152	294
Foreign debt	18	16	16	16	26
Retail debt	5	3	1	1	1
Total market debt	695	705	721	765	1,236

Sources: Bank of Canada; Department of Finance calculations

Note: numbers may not add due to rounding.

[1] Includes additional debt that accrues during the fiscal year as a result of the inflation adjustments to Real Return Bonds.

2021 Debt Management Strategy

Covid 19 & Bank of Canada

- **March 27, 2020 announcement: Bank engages in unconventional monetary policy. Over the next month it announced:**
  - **$5 billion weekly purchase of Government of Canada securities**
  - **$50 billion provincial bonds**
  - **$10 billion corporate bonds**
  - **$36 billion banker's acceptance**
  - **$3 billion mortgage bonds**
  - **40% of the weekly Treasury Bills**
  - **Overnight rate lowered to 0.25%**

- **Bank is now tapering its bond buying and has stopped most of the temporary "liquidity" programs**

Household Saving Rates of Major Nations

	Percentage of Disposable Household Income					
	U.S.	Canada	France	Germany	Japan	U.K.
2006	3.8%	2.6%	9.0%	10.6%	2.7%	3.1%
2007	3.7%	2.2%	9.4%	10.7%	2.8%	4.4%
2008	5.0%	3.3%	9.3%	10.9%	2.7%	3.3%
2009	6.1%	4.5%	10.6%	10.4%	4.2%	6.4%
2010	6.5%	4.3%	10.5%	10.3%	3.9%	6.9%
2011	7.2%	4.2%	9.9%	10.0%	4.2%	4.5%
2012	8.9%	4.7%	10.0%	9.7%	2.9%	3.9%
2013	6.4%	4.7%	8.5%	9.3%	0.6%	3.1%
2014	7.4%	3.5%	8.9%	9.8%	0.1%	3.6%
2015	7.5%	4.1%	8.3%	10.1%	1.4%	4.9%
2016	6.9%	1.6%	8.2%	10.2%	3.3%	2.2%
2017	7.2%	1.9%	8.4%	10.6%	2.6%	0.0%
2018	7.8%	0.7%	8.6%	10.9%	4.3%	0.3%
2019	7.5%	1.2%	9.1%	10.9%	5.3%	0.7%
2020	16.4%	14.3%	20.6%	16.2%	7.1%	19.4%
Average	7.2%	3.9%	10.0%	10.7%	3.2%	4.5%
Y/Y Change	8.9%	13.0%	11.5%	5.4%	1.8%	18.7%

Managing the balance sheet

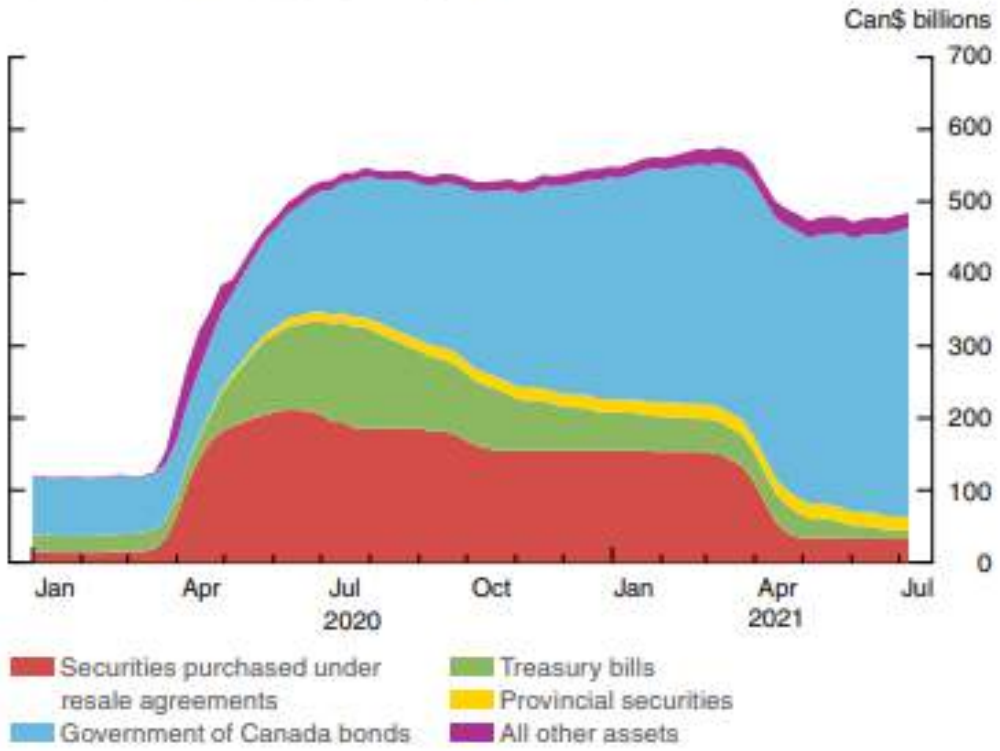
Financial position
(in millions of Canadian dollars)

As at December 31	2020	2019
Assets		
Loans and receivables	155,323.9	15,521.9
Investments	391,764.8	103,346.9
All other assets*	744.7	774.0
Total assets	547,833.4	119,642.8
Liabilities and equity		
Bank notes in circulation	106,925.0	93,094.3
Deposits	436,100.5	25,243.3
Securities sold under repurchase agreements	3,000.8	-
Derivatives—Indemnity agreements with the Government of Canada	29.3	-
Other liabilities	1,199.7	774.9
Equity	578.1	530.3
Total liabilities and equity	547,833.4	119,642.8

* Includes *Cash and foreign deposits*, *Capital assets* and *Other assets*

Chart 20: The Bank's balance sheet continues to evolve

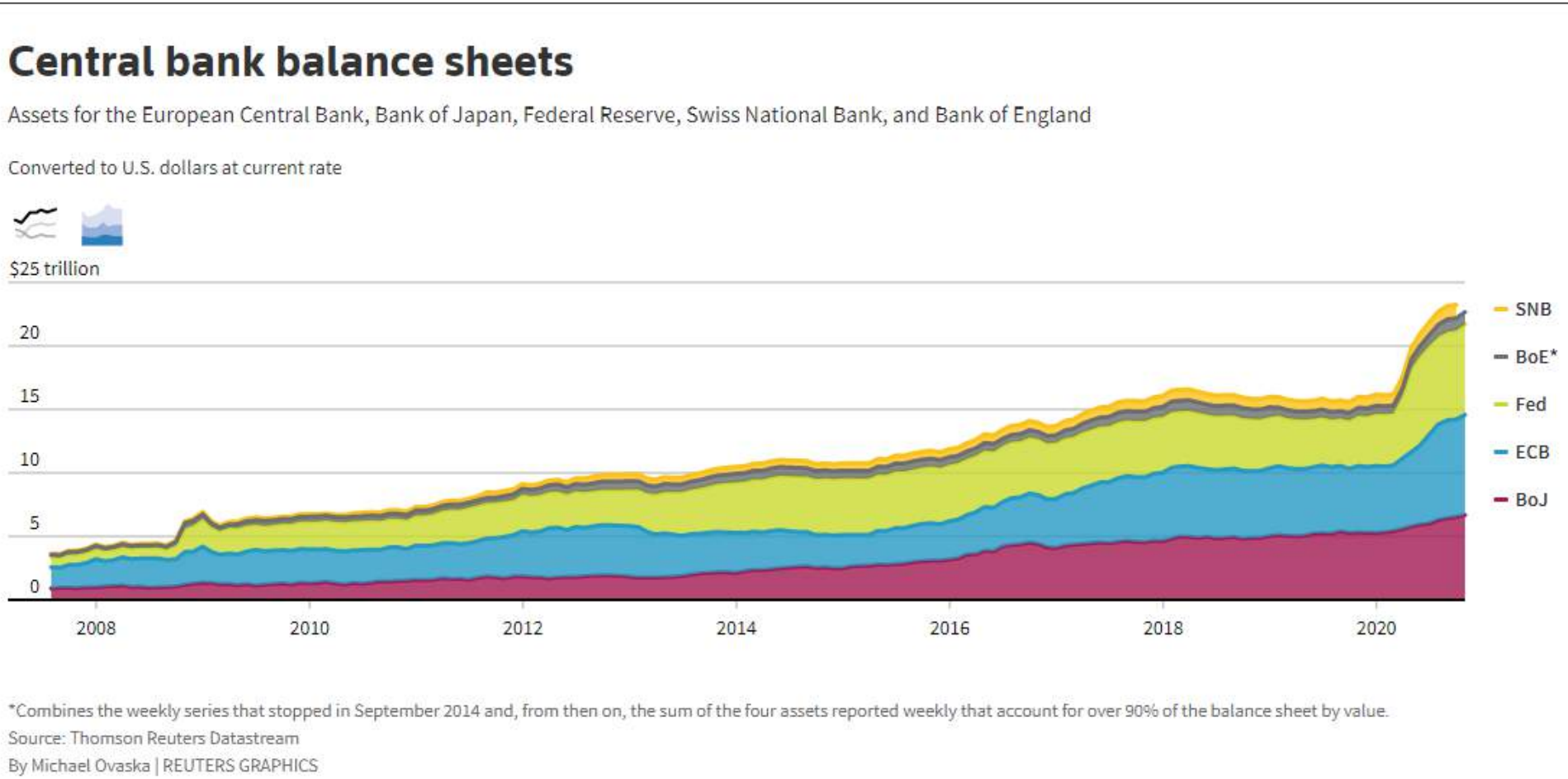
Bank of Canada total assets,* weekly data



* Government of Canada (GoC) bonds purchased in primary markets are measured at amortized cost. All other bonds, including GoC bonds purchased in secondary markets, are measured at fair value. "All other assets" includes Canada mortgage bonds, real return bonds, corporate bonds and commercial paper. A full list of assets can be found on the Bank of Canada's website.

Source: Bank of Canada

Last observation: July 7, 2021



Reuters: about $20 trillion increase in liquidity
Most has been recycled as deposits at central banks

Big Question

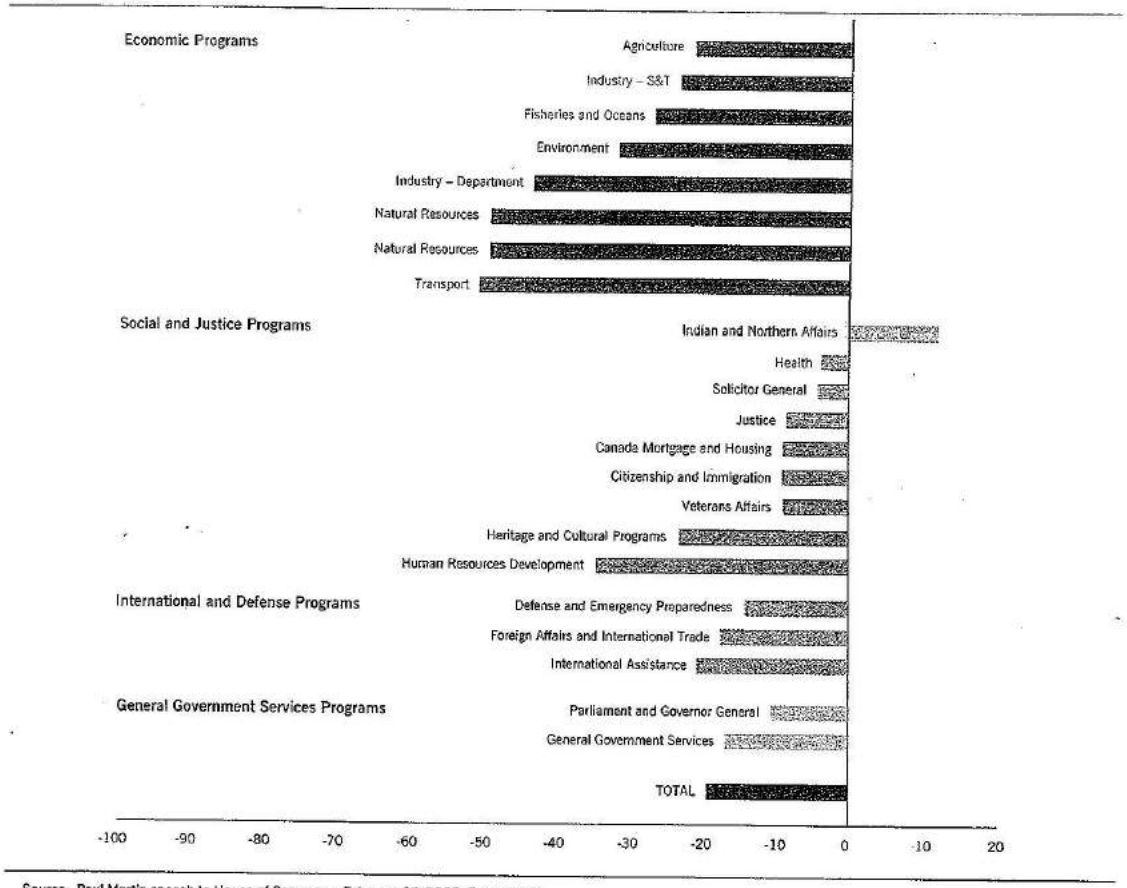
- **What happens when Canadians draw down their excess savings and revert to normal spending patterns and go to the banks for more loans?**
- **An extra $500 billion in deposits at banks implies a huge lending capability**
  - **Bonds sold and higher interest rates?**
  - **Increased consumer demand and prices?**
- **What policy tools does the Bank have to control consumer demand driven inflation if it occurs?**
  - **Higher policy rates?**
    - **Quantity restrictions on banks (pre-1999) forcing bank holdings of government securities?**
    - **Higher taxes on passive ("unearned") income?**
    - **1945-1953 period of financial repression?**

5 C's of Credit (applies to all credit)

- ***Character***
  - ***Does the borrower have integrity (impose austerity)?***
- ***Capacity***
  - ***Does the borrower have the capacity to generate income to pay interest?***
- ***Capital***
  - ***Does the borrower have high net worth (wealthy)?***
- ***Collateral***
  - ***Are there marketable assets to support the loan?***
- ***Conditions***
  - ***Are the financial markets receptive to lending?***

Austerity can work

Figure 2 Extent of the Cuts to Various Departments' Budgets



Source: Paul Martin speech to House of Commons, February 27, 1995, Department of Finance, Canada. Accessed at: http://www.fin.gc.ca/budget95/speech/SPEECH9-eng.asp.

Canada moved into a budget surplus by 1997 and has generally had lower interest rates than the US since then. Canada was lucky in that it was partially bailed out by a favourable international trading position.