Governors' order: twice over-easy?

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## Overview of presentation

#### Outline & background

- summary of main themes
- COVID-period monetary policy

#### Monetary policy measures

- their basis in the yield curve
- Shadow Short Rates and more

#### Yield curve decompositions

- expected policy rate and risk premium
- examples and results

#### Twice over-easy?

nominal and real short-maturity rates

# 1. Outline & background

## **Outline & background**

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## Summary of main themes

I provide perspectives on the stance of monetary policy from the onset of the COVID-19 pandemic to the present

- "Once over easy" is main theme of presentation
  - refers to the large stimulus from monetary policy, by conventional and unconventional means, in response to the COVID economic disruption
  - how large? I outline metrics derived from yield curve data for the stance of monetary policy in the G4 and dollar-bloc economies (US, EA, JP, UK, CA, AU, NZ)
- "Twice over easy?" is second theme of presentation
  - central banks have since reduced their stimulus considerably
  - but interest rates remain quite accommodative on a real (inflation-adjusted) basis
- Note "Governors' order" is plural then singular because comments apply to central banks generally. NZ and Canada examples used given context of presentation

# Conventional Monetary Policy (CMP) easing

On COVID onset, central banks with positive Policy Interest Rate (PIRs) cut them to near-zero (eg. 0.25% in NZ & Canada). EA and JP left their near-zero PIRs in place



## Unconventional Monetary Policy (UMP) easing

To provide additional stimulus, central banks also used other tools; broadly Quantitative Easing (QE), Credit Easing (CE), and Forward Guidance (FG) on the PIR and other policy settings



# CMP and UMP tightening

As COVID and its economic disruption diminished, and inflation had increased and remained persistent, central banks raised their PIRs and ceased or reversed UMP actions



Outline & background

# The NZ mix of CMP and UMP over COVID period

#### Major NZ COVID-period monetary policy events

- 1 16-Mar-2020 OCR cut from 1% to 0.25% (CMP) with 12-month no-change commitment (PIR FG) and delay to 2022 for intended bank capital increase announced (CE, resumed 1-Jul-2022)
- 2 23-Mar-2020 LSAP programme of up to \$30 billion announced (QE & QE FG)
- 3 7-Apr-2020 LSAP (Large Scale Asset Purchases) limit raised to \$33 billion (QE/FG)
  - 30-Apr-2020 Removal of Loan-to-Value Ratios for one year announced (CE, reinstated 1-Mar-2021)
- 4 13-May-2020 LSAP limit raised to \$60 billion (QE/FG)
- 5 12-Aug-2020 LSAP limit raised to \$100 billion (QE/FG). Funding for Lending Programme (FLP) and preparations allowing a negative OCR noted (CE&PIR FG)
- 6 11-Nov-2020 FLP announced, and introduced on 7 December 2020 (CE, initial allocation window ended on 6-Jun-2022, and FLP ended on 6-Dec-2022)
- 7 14-Jul-2021 LSAP discontinuation by 23 July 2021 announced (QE FG)
- 8 18-Aug-2021 OCR track indicates imminent OCR "lift-off" (PIR FG)
- 9 6-Oct-2021 OCR raised from 0.25% to 0.5% (CMP, "Lift-off" followed by subsequent increases)
- 10 23-Feb-2022 LSAP unwind at \$5 billion per year announced (Quantitative Tightening, QT)

#### Other economies also used a mix of CMP and UMP

# Canadian UMP for GFC & COVID (forward guidance)

Bank of Canada	
Date	Narrative
April 21, 2009	" conditional on the inflation outlook, commits to hold the current policy rate until the end of the second quarter of 2010." https://www.bankofcanada.ca/2009/04/fad-press-release-2009-04-21/
April 20, 2010	"With recent improvements in the economic outlook, the need for such extraordinary policy is now passing, and it is appropriate to lessen the degree of monetary stimulus. The extent and timing will depend on the outlook for economic activity and inflation and will be consistent with achieving the 2 percent inflation target." https://www.bankofcanada.ca/2010/04/fad-press-release-2010-04-20/
July 15, 2020	"The Governing Council will hold the policy interest rate at the effective lower bound until economic slack is absorbed so that the 2 percent inflation target is sustainably achieved." <u>https://www.bankofcanada.ca/2020/07/fad-press-release-2020-07-15/</u>
June 9, 2021	"The Governing Council judges that there remains considerable excess capacity in the Canadian econ- omy and that the recovery continues to require extraordinary more policy support." <u>https://www.bankofcanada.ca/2021/06/fad-press-release-2021-06-09/</u>
January 26, 2022	"The Governing Council therefore decided to end its extraordinary commitment to hold its policy rate at the effective lower bound. Looking ahead, the Governing Council expects interest rates will need to increase" https://www.bankofcanada.ca/2022/01/fad-press-release-2022-01-26/
June 1, 2022	"With the economy in excess demand, and inflation persisting well above target and expected to move higher in the near term, Governing Council continues to judge that interest rates will need to rise further." https://www.bankofcanada.ca/2022/06/fad-press-release-2022-06-01/

#### Table from Siklos (2023)

## Canadian UMP for COVID (asset purchases)





Data from Statistics Canada Maximum was nearly 25% of GDP, Siklos (2023) (note: immaterial balance sheet expansion post-GFC)

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Forward Guidance  $\Rightarrow$  policy and inflation

#### One approach: quantify CMP + UMP with yield curve data

- yield curve: interest rates for different times to maturity
- principle is yield curve embeds current CMP & UMP settings, and guidance/expectations of their evolution

Shadow Short Rates (e.g. Krippner 2015) are one example Leo's 15 minutes of fame: highest profile central-banking references are St. Louis Federal Reserve Bank President James Bullard (2012), European Central Bank President Mario Draghi (2019), and 2017 Economics in Central Banking Award

## Shadow/LB term structure framework overview

- ZLB short rate = Shadow Short Rate + currency option
  - $\mathbf{r}(t) = \mathbf{r}(t) + \max[-\mathbf{r}(t), \mathbf{0}]$ , (re-arranged from Black 1995)
- $\Rightarrow$  ZLB yields = shadow yields + option effect



## Two more yield curve monetary policy metrics

**Expected Time to Lift-off (ETL)**: if SSR is negative, horizon when SSR path from estimated model passes through zero **Effective Monetary Stimulus (EMS)**: area of expected PIR path relative to Long-horizon Natural Interest Rate (LNIR)



Calculate each day to assess evolution of CMP & UMP over time

# The three monetary policy metrics for New Zealand

No single metric is ideal. Best used as a suite of indicators



## Note: ETL is negated to align with SSR and EMS metrics

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## Note: ETL is negated to align with SSR and EMS metrics

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# SSR for NZ, CA, and other economies

#### Magnitude of -ve SSR can vary with model and data choices



These results use same model spec. & yield curve maturities

# ETL for NZ, CA and other economies

## ETL only available in UMP periods, i.e. when SSR is negative



But useful cross-check, and quite robust to model and data choices

# EMS for NZ and other economies

#### EMS variation mainly follows 5-year interest rates



#### LNIR based on long-horizon nominal GDP growth expectations

# **RBNZ** estimates of UMP easing

# From RBNZ's review: "In Retrospect: Monetary Policy in New Zealand 2017-22" (released 10 November 2022)

Figure 39 - Suite of indicator models



Mortgage rate regression is the preferred metric: "at their peak influence, the OCR-equivalent stimulus from the use of AMP [Alternative MP] tools was around 90 basis points."

# Feedback on RBNZ's preferred UMP stance indicator

"The Reserve Bank looks forward to the informed feedback and commentary that the report will no doubt generate." Neil Quigley, RBNZ Board Chair

- -0.90% OCR-equivalent seems implausibly mild
- suggests an OCR-equivalent easing of around just 2% (from 1% OCR that prevailed Aug-2019 to 15-Mar-2020)
- $\bullet\,$  Gagnon and Sack (2018) 1.5% of GDP  $\simeq 0.25\%\,$  PIR
  - \$55 billion LSAPs  $\div$  \$328 billion 2021 nominal GDP = 16.7%
  - $16.7\% \div 1.5\% \times 0.25\% = 2.8\% \ (< SSR)$
  - \$100 billion (announced LSAP limit) = 5.1% (> SSR)
- Gagnon and Sack (2018) applied to Canada
  - $\sim 25\% \div 1.5\% \times 0.25\% = 4.2\%$  (?  $\gg$  SSR)

# Other perspectives suggest -0.90% too mild

Implicit comparison from earlier slides

 if RBNZ eased to the OCR-equivalent of -0.90%, and was the most stimulatory according to three metrics, then other central banks implicitly provided very little COVID-period stimulus beyond near-zero Policy Interest Rate settings

Ultimate test is consistency with macroeconomic outcomes

- OCR-equivalent of -0.90% (or less for other economies) seems inconsistent with current persistent and elevated core inflation in NZ (and other economies) ...
- ...and with prior RBNZ forecasts that used a published "unconstrained OCR" track
- would need careful testing, including appropriately accounting for other influences

## Main points for all of the economies shown

In wake of COVID economic disruption, SSR, ETL, and EMS indicate that the **mix of CMP + UMP was very stimulatory** 

That **stance of monetary policy proved "over-easy"** when COVID economic disruption had diminished: core inflation increased to and has persisted at multi-decade highs

Monetary policy was then rapidly tightened, evident from all three metrics and from PIR "lift-offs" and ongoing increases (Japan the exception so far)

**New Zealand was "deepest and steepest"**, by all three metrics, in its COVID monetary policy cycle ("least regrets", then early & pronounced tightening)

**Canada was among the mildest** (& also for post-GFC)

# NZ fiscal policy also very stimulatory, CA not as much



Note: fiscal data is from the IMF ("Fiscal Monitor: Database of Country Fiscal Measures in Response to the COVID-19 Pandemic") and is the additional spending and forgone revenue from Jan-2020 to Jun-2021

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## Expected policy rate and risk premium

R data, observed yield curve, is composed of:

- EPIR: Expected Policy Interest Rate (mean of path)
- BYRP: Bond Yield Risk Premium
- negligible residuals, i.e. R model  $\simeq$  R data, so ...

#### R model = EPIR + BYRP

Useful to express with EPIR gap = EPIR – LNIR

- LNIR: Long-horizon Natural Interest Rate (nominal)
- proxied by Consensus Forecasts of long-horizon GDP growth & inflation (less a spread)

#### R model = LNIR + EPIR gap + BYRP

# Most recent yield curve decomposition for Canada



Yield curve perspective gives mean of path to each maturity

Forward rate perspective gives the path itself

## Forward rate curve for the yield curve decomposition



EPIR > LNIR: +ve EPIR gap, with expected decline ⇒ restrictive monetary policy stance, with gradual easing +ve risk premium component (QT) ⇒ longer-maturity yields > mean of expected PIR path

## Forward rate curve three years earlier



**EPIR** < LNIR: -ve EPIR gap, with expected increase

⇒ stimulatory monetary policy stance, with eventual tightening
 -ve risk premium component (QE)
 ⇒ longer-maturity yields < mean of expected PIR path</li>

## Time series of 5-year yield decomposition for Canada



**LNIR**: mild decline over time, mainly  $\mathbb{E}(Y) \& \mathbb{E}(\pi)$ **EPIR gap**: mainly stimulatory monetary policy since GFC risk premium: large decline over time, mainly  $\pi$  risk most -ve during COVID period, then material reversal

## Yield curve decomposition results by economy



#### all have similar themes to Canada, except Japan

## Yield curve decomposition results by category



#### exceptions for Japan very evident in each category

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# 3. Twice over-easy? [Note: data to Mar-2023]

Previous section was based on equations like

$$\underline{\mathbf{f}}(t,\tau) = \mathbf{r}_{L} + [\mathbf{f}(t,\tau) - \mathbf{r}_{L}] \cdot \Phi \left[ \frac{\mathbf{f}(t,\tau) - \mathbf{r}_{L}}{\omega(\tau)} \right]$$

$$+ \omega(\tau) \cdot \phi \left[ \frac{\mathbf{f}(t,\tau) - \mathbf{r}_{L}}{\omega(\tau)} \right]$$

Krippner, Leo (2015), "Zero Lower Bound Term Structure Modeling", Palgrave MacMillan

This section is based on the century-old Fisher equation

$$r \simeq i - \pi$$

real interest rate  $\simeq$  nominal interest rate – inflation rate Fisher, Irving (1907), "The Rate of Interest", MacMillan

# Recent inflation has been elevated

Annual CPI inflation is at levels last seen in the 1980s



Note: year-on-year % change of all items CPI (FRED), ex-GST

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## Nominal 3-month rates have increased

#### The rise reflects central banking PIR increases



## Note: data compiled from IMF, FRED, and Bloomberg

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## But real 3-month interest rates still quite low

They are around the levels from the 1970s and early 1980s



#### None are even above zero !!

## Real SSRs have been low for a long time

#### SSRs used from 1995 to account for UMP



So G4 real rates have been low on average over past decade

# Long 5-year yield decomposition for US (to date)



UMP period  $\Leftrightarrow$  very low EPIR gap & risk premium both have risen sharply since COVID lows LNIR: so far remains  $\simeq$  steady, CB credibility  $\mathbb{E}(\pi)$ 

Twice over-easy?

## 5. Conclusion

Shadow Short Rates, Expected Time to Lift-off, Effective Monetary Stimulus, and risk premiums quantify very stimulatory monetary policy in the wake of the COVID economic disruption. One outcome has been core inflation at multi-decade highs: "Once over-easy"

Central banks have since tightened monetary policy rapidly to reign in inflation. But **post-2008 has been very accommodative**, and current **real interest rates remain negative**, similar to levels that prevailed in the 1970s

**Present inflation environment has** differences (e.g central bank credibility), but also **some eerie echoes to 1970s**, e.g. supply shocks as higher-inflation catalyst, labour market power, multiple-target monetary policy & regime change: "Twice over-easy?"