# Risk Management Approach to Price Stability

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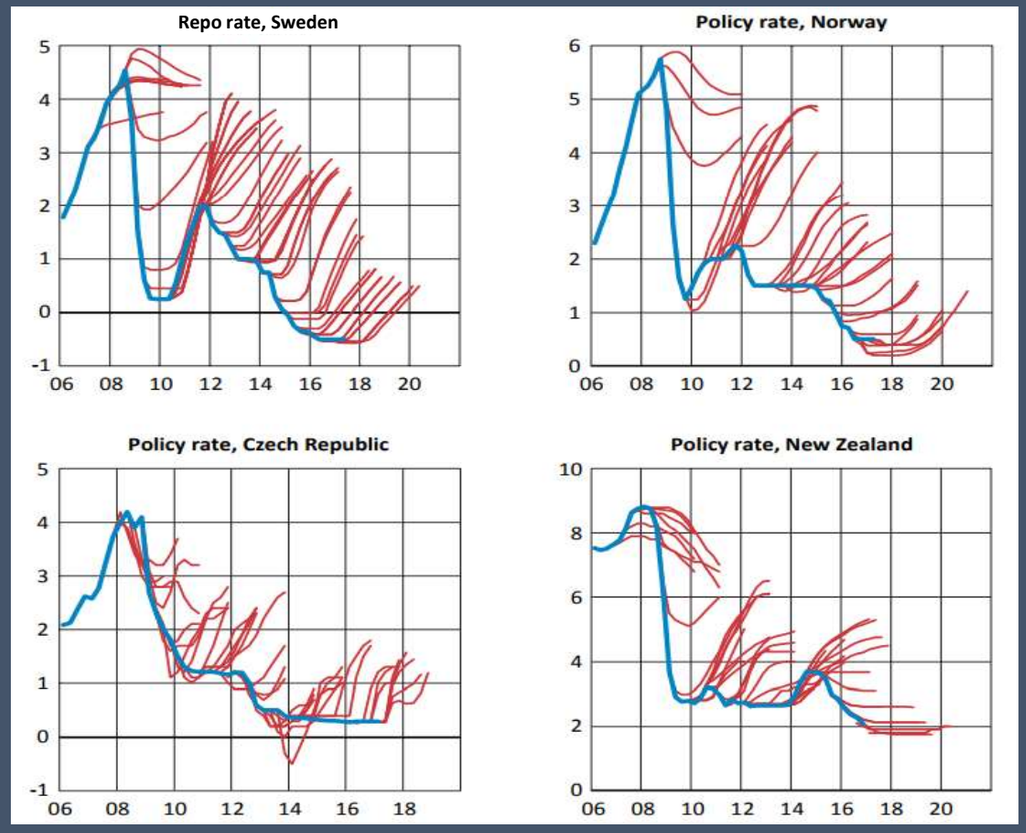
# Current Approaches to Monetary Policy Work Great, Until They Don't

Big shocks hitting the economies have become more frequent

High uncertainty about the state of the macro-economy is the New Normal

# Current Approaches to Monetary Policy Work Great, Until They Don't

- Baseline projections (forecasts) are folly especially in times of high uncertainty
- Baseline projections in the clothes of assurance and confidence has the potential to mislead both policymakers and economic agents by providing a false sense of security and affecting the credibility of the CB
- Monetary policy is a risk management rather a forecasting exercise.




*Source: Alsterlind, Jan (2017) "Common features in short maturity interest rate forecasts", Staff memo, Sveriges Riksbank.*

# Main Question

## How do we design a framework, which:

- Addresses the issue of uncertainty in monetary policymaking (MPRM);
- Shifts the policymaking focus from optimizing the policy path for the most likely future to ensuring more policy flexibility;
- Recognizes that important nonlinearities can kick in and drag the economy towards “dark corners”(e.g. ELB, getting stuck in low or high inflation trap, etc.)

# The Need for Monetary Policy as Risk Management (MPRM)

"MPRM approach emphasizes

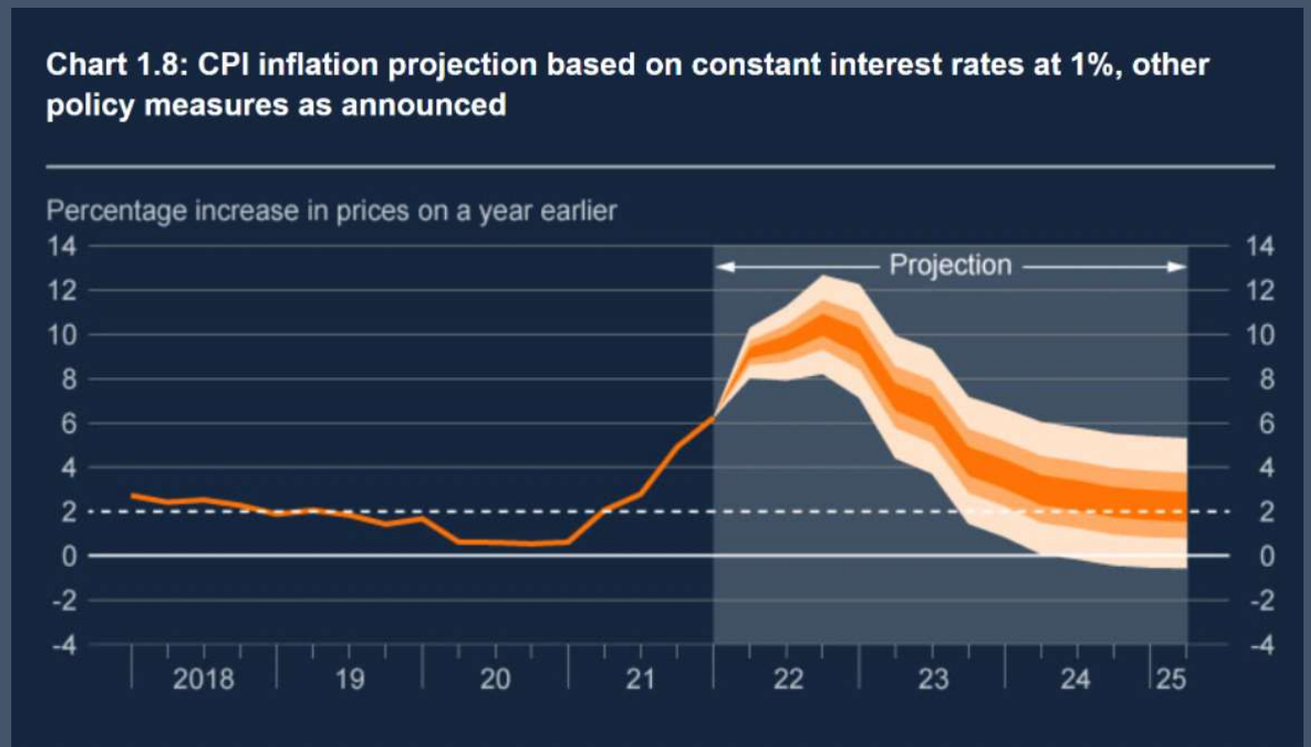
- understanding as much as possible the many sources of risk and uncertainty that policymakers face,
- quantifying those risks when possible, and
- assessing the costs associated with each of the risks".

*- Alan Greenspan (2004)*

# Qualitative Risk Management is Just Discretion without a Framework in place

- Monetary Policy as Risk Management (MPRM) is a good way of dealing with uncertainty, but without a framework in place, it's just discretion.
- We need a systematic approach to addressing uncertainty that is both **qualitative and quantitative.**

Non-FPAS Constant Interest Rate: BoE




*Source: Bank of England Monetary Policy Report.*

# FPAS Mark I: New Zealand, Canada, Czech Republic, Chile, etc.

- A clear target for the policy to guide expectations;
- Endogenous objective-consistent paths for policy, while emphasizing its forward-looking nature;
- Systematic and transparent communication of policy

# Essential Ingredients of FPAS Scenarios

Where is the economy now?

What do we think might be driving it?

What do policy instruments need to do to achieve basic policy objective?
Elevating importance of avoiding dark corners

# FPAS Mark I: A Good System, But Why is it Imperfect?

*It can't deal with uncertainties…*

## Folly in Baselines


## Folly in Local Approximations

Introducing…

# FPAS Mark II

A systematic framework for incorporating MPRM in the policymaking process

# Governor Talk - Armenia: Risk Management Approach to Price Stability: The Role of Policy Credibility


CBA Working Paper 22/10/06

FPAS Mark II: Avoiding Dark Corners and Eliminating the Folly in Baselines and Local Approximations

by David Archer, Martin Galstyan, Douglas Laxton

October 10, 2022

https://www.imfconnect.org/content/imf/en/annual-meetings/calendar/open/2022/10/13/168512.html

# How Do We Eliminate Folly in Baselines?

Case scenarios serve as illustrative examples of policy responses to relevant risks and uncertainties

**Case A:** A plausible hawkish scenario.
Policy rate path higher than market expectations.

**Case B:** A plausible dovish scenario.
Policy rate path lower than market expectations.

**Case X(Y):** Avoiding dark corners.
E.g. high and variable inflation, or a low inflation trap

# Essential Ingredients of FPAS Scenarios

Where is the economy now?

What do we think might be driving it?

What do policy instruments need to do to achieve basic policy objective?
Elevating importance of avoiding dark corners

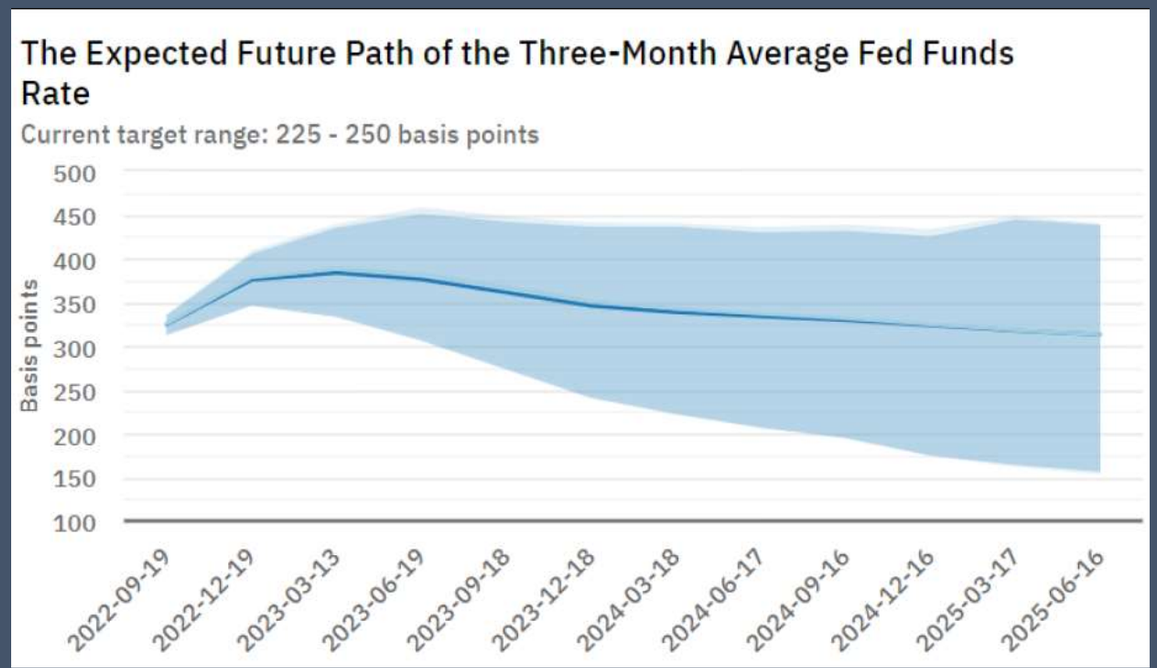
*Ingredients need to be:*

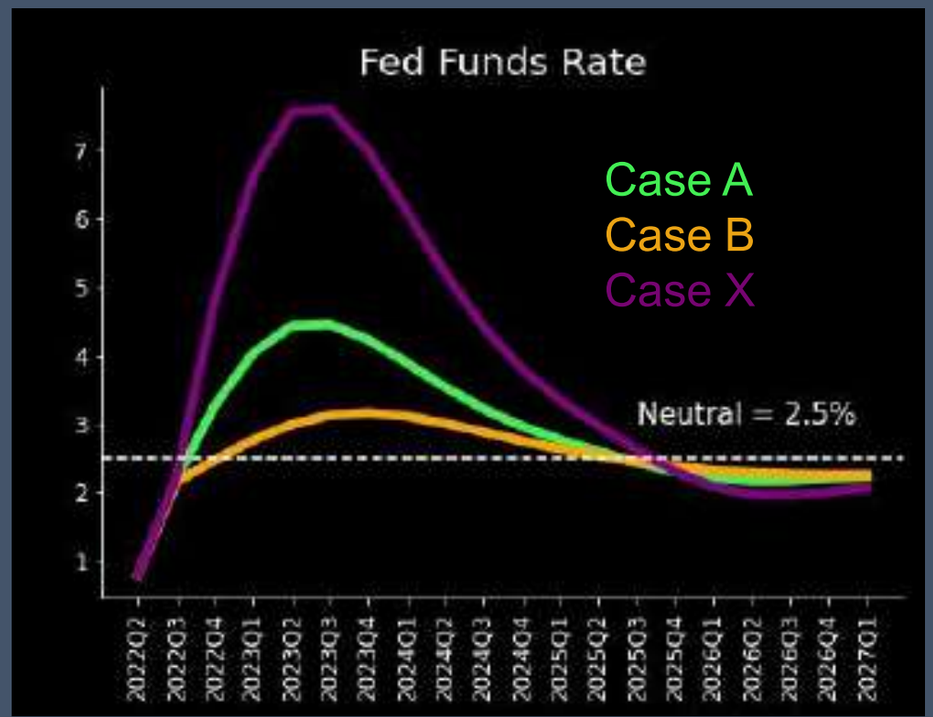
**Related to the current data**

**Realistic**

**Relevant for policy**

# Case Scenarios describe the Underlying Risks that might require a Tighter or Easier Monetary Policy then what is Expected in the Market




As of August 29, 2022
Source: Federal Reserve Bank of Atlanta

# Policymakers Need Analytical Tools that are Actually Relevant to Policy and its Uncertainties

Nice to have in FPAS Mark I, but Absolutely Necessary in FPAS Mark II

Crucial non-linearities (convex Phillips curve, endogenous policy credibility)

Loss minimization function for monetary policy

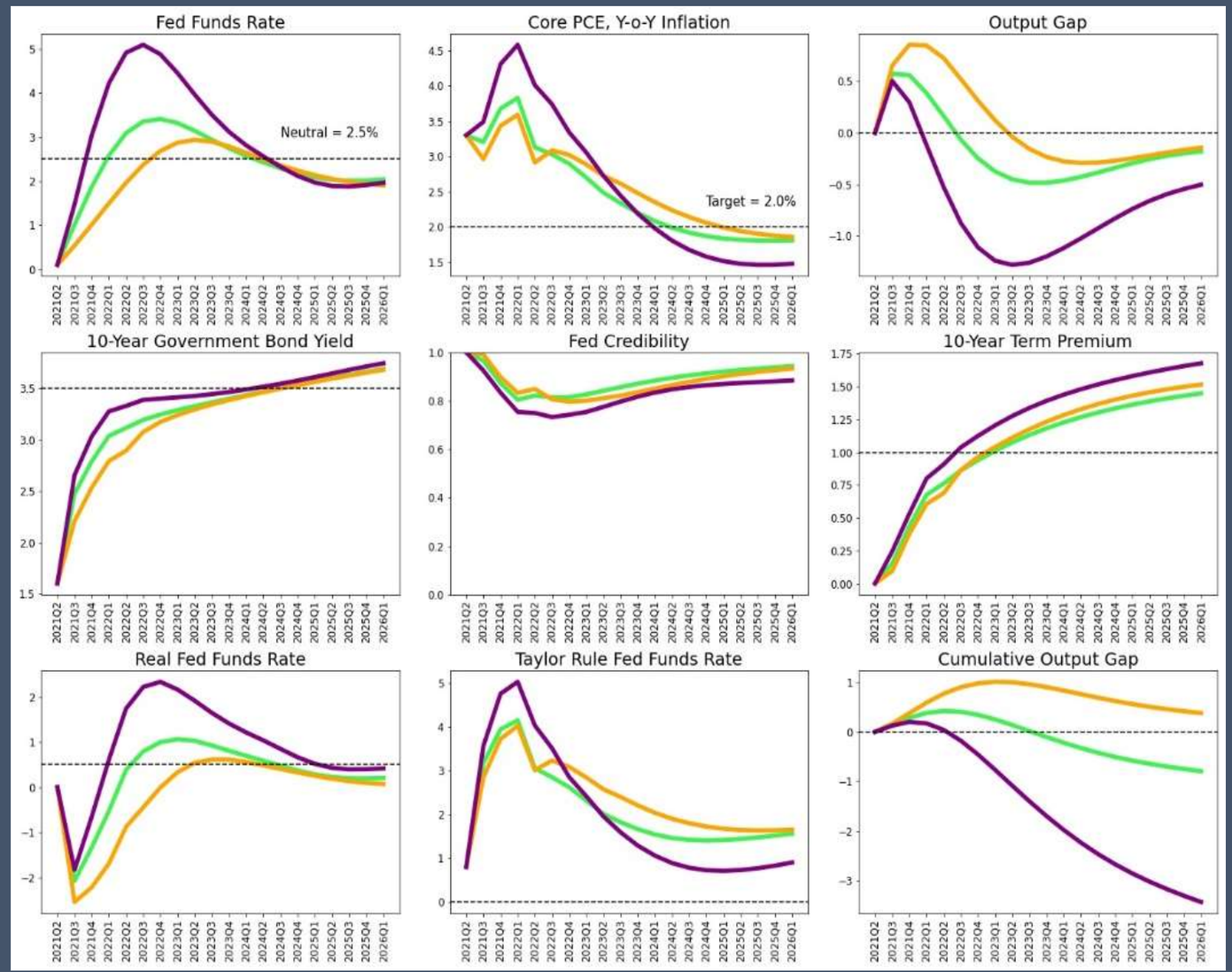
Nasty, occasionally-binding constraints such as the effective lower bound on interest rates

Policy implications of parameter uncertainties

*see Appendix for more*

# FPAS Mark II Would Have Made Summer 2021 So Much Easier

Key metrics for
Case A
Case B
Case X



# FPAS Mark II: An institutional set-up for Decision-Making under MPRM

**Relatively tighter MP Scenario (Case A)**

Despite the expected decrease in overall inflation, wages and prices of a number of goods and services characterized by “sticky prices" still continue to grow at a high rate, also reflecting the persistence of high aggregate demand. Therefore, in the short-term, even in an event of a slowdown in 12-month inflation, the risks of higher inflation in the future are still not completely neutralized

**Relatively easier MP Scenario (Case B)**

In the near future, a significant reduction in 12-month inflation is expected due to observed deflationary effects from imported food and non-food products. Therefore, if such trends are accompanied by respective decrease in inflation expectations, as well as by the continuation of the deflationary effects of the exchange rate appreciation the face of continued capital inflow, then there are risks of entering into a persistent low inflation environment in the coming period.

*Making a Decision as Risk Management*

**By discussing the Case Scenarios, the Board emphasized the necessary commitment to the management of future inflationary risks and the final victory against inflation**

# Monetary Policy Frameworks: The Big Picture

| | Non FPAS (BOE, ECB) | FPAS Mark I (CNB, RBNZ, NBG etc.) | FPAS Mark II (CBA?) |
|---|---|---|---|
| **Three Ingredients of FPAS** | ✗ | ✓ | ✓ |
| **Uncertainty: Scenario Analysis** | ✗ | ✗ ✓ | ✓ |
| **Avoiding Dark Corners or "Least Regrets" Policy** | ✗ | ✗ | ✓ |
| **Accountability and Transparency** | ✗ | ✗ | ✓ |

# Thank you

# Technical Appendix

# Monetary Policy Loss Function

$$Loss = \sum_{i=0}^{\infty} \left[ 1.0(\pi 4_{t+i} - \pi^*)^2 + 1.0 y_{t+i}^2 + 0.5(rs_{t+i} - rs_{t+i-1})^2 \right]$$

- Under IT, deviations from inflation target carries high costs.
- Avoiding the deviations of output from its potential level in the short run minimizes the amplitude of the business cycle.
- Aversion to sharp movements in the policy interest rate- gradual changes in policy rates will have a strong response of expectations about the future policy rate, strengthening the effectiveness of policy transmission.
- Despite the symmetric loss function, the full model does not imply symmetric policy responses since endogenous credibility results in a stronger interest rate response to overshoots than to undershoots.

# Inflation Equation-Expectations-Augmented Phillips Curve

$$\pi_t = \lambda_1 \cdot \pi 4_t^e + (1-\lambda_1) \cdot \pi 4_{t-1} + \underbrace{\lambda_2 \cdot \left( \frac{y_{t-1}}{y_{max} - y_{t-1}} y_{max} \right)}_{\text{Non-linear output gap effect}} + \varepsilon_t^{\pi}$$

$$(\lambda_1 = 0.70, \lambda_2 = 0.10, ymax = 6.0)$$

Where

- $\pi 4_t^e$ are inflation expectations
- $\pi 4_{t-1} = \frac{1}{4}\sum_{i=1}^{4} \pi_{t-i}$ is the backward-looking component of inflation.
- $y_{t-1}$ is the output gap in the period t − 1
- $y_{max}$ is the maximum output gap possible

# Inflation Regimes and CB Performance

- ”L” − low inflation (convergence to the $\pi*$ target)
- ”H” − High inflation (convergence to higher level-10%)

$$\pi4_t^L = \Gamma^L \cdot \pi4_{t-1} + (1-\Gamma^L)\cdot \pi^* + \varepsilon_t^{\pi^L}$$
$$(\Gamma^L = 0.5, \pi^* = 2)$$

$$\pi4_t^H = \Gamma^H \cdot \pi4_{t-1} + (1-\Gamma^H)\cdot 10 + \varepsilon_t^{\pi^H}$$
$$(\Gamma^H = 0.9)$$

Central bank performance indicator:

$$\eta_t = \frac{(\pi4_t^H - \pi4_t)^2}{(\pi4_t^H - \pi4_t)^2 + (\pi4_t^L - \pi4_t)^2} = \begin{cases} 1, \text{ in ”L” case} \\ 0, \text{ in ”H” case} \end{cases}$$

# Credibility and Expectations

Credibility stock:

$$C_t = \rho \cdot \eta_{t-1} + (1-\rho) \cdot C_{t-1} + \varepsilon_t^C, \quad (\rho = 0.1)$$

Formation of expectations:

$$\pi 4_t^e = C_t \cdot \pi 4_{t+4} + (1 - C_t) \cdot \pi 4_{t-1} + b_t + \varepsilon_t^{\pi^e}$$

Where

- $\pi 4_{t+4}$ is the 4-quarter ahead year-on-year inflation rate
- $\pi 4_{t-1}$ is the year-on-year inflation rate observed last quarter
- $C_t \in [0:1]$ indicates credibility

$b_t$ is inflation expectation bias, as a function of credibility stock

$$b_t = 0.1(1 - C_t)$$

# Output Gap Equation

$$y_t = 0.57_1 y_{t-1} + 0.23 y_{t+1} - 0.19(rr_{t-1} - \overline{rr}_{t-1}) + \varepsilon_t^y$$

Where:

- rr is the real interest rate in percentage points
- z is the real exchange rate
- $y_t^{US}$ is the U.S. output gap
- the bars denote the equilibrium values of variables
- $\varepsilon_t^y$ is demand shock