Table of Contents

TE TAI ŌHANGA
THE TREASURY

Guest Seminar with Professor John Cochrane, Senior Fellow, Hoover Institution, Stanford University

"The Fiscal Theory of the Price Level"

The session will begin at 10.30 am.
Please mute your microphones and turn your cameras off when you arrive in the meeting.

For Questions & Answers sessions, please use Q&A function.
For technical help, please use Chat function or email the team: Treasury.AcademicLinkages@treasury.govt.nz

Suggestion! Pin the presenter - while in the Teams meeting, from the meeting controls, click or tap **Show Participants**. In the Participants column, click or tap the **three-dots icon** to reveal a menu. From the drop down menu, select **Pin**. The pinned participant becomes the focus in your view (and only your view) regardless of the speaker. To unpin, repeat these three steps and select **Unpin.**

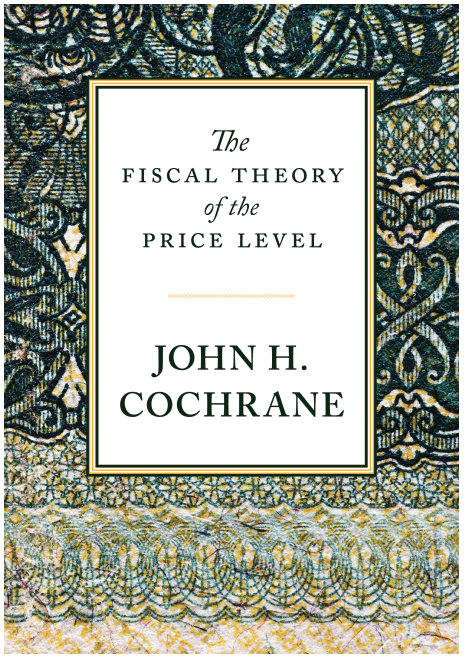
29 September 2023

Inflation and Interest Rates

John H. Cochrane
Hoover Institution

Ads

- *The Fiscal Theory of the Price Level*
- “Expectations and the Neutrality of Interest Rates"
- “Fiscal Histories"
- https://www.johnhcochrane.com/
- “Interest rates and inflation” *Grumpy Economist*

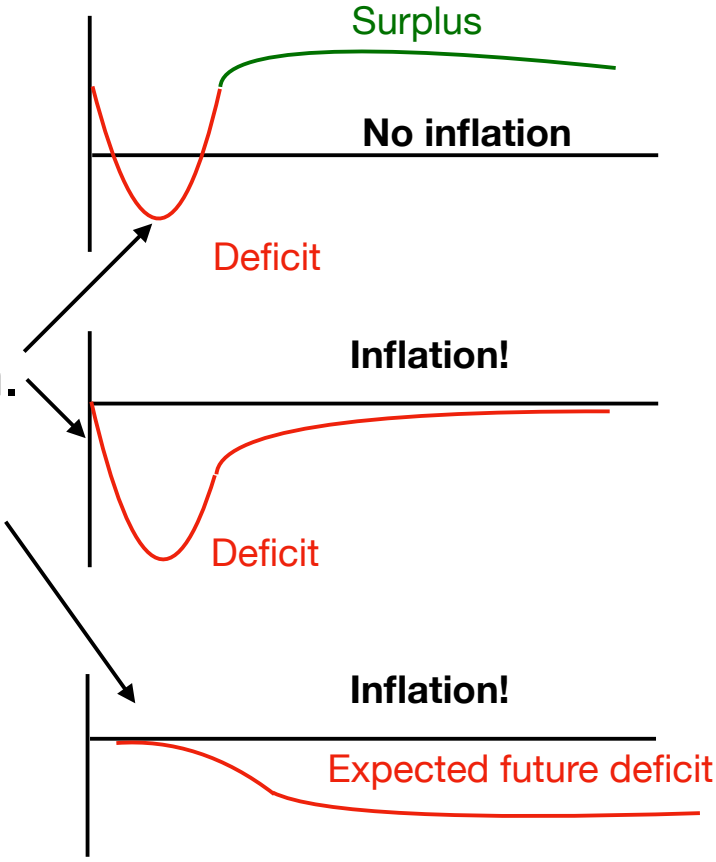


Fiscal theory of the price level

$$\frac{\text{Nominal government debt}}{\text{price level}} = \text{Present value of primary government surpluses}$$

$$\frac{B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \frac{1}{R_{t,t+j}} s_{t+j}$$

- Debt vs. *long run* ability/will to repay. Like stocks & bonds.
- Not necessarily *today's* deficits or debt. "Stock" vs. Keynesian "flow."
- Lots of debt/deficit possible with no inflation. That's typical or good policy.
- Inflation can surprise, with no current deficit.
- Higher discount rate / interest costs = more inflation. Empirically important.
- "Nominal anchor;" foundation for more complex dynamics. Sticky prices, DSGE.



Fiscal theory of monetary policy

$$\frac{1}{1+i_t} = \beta E_t\left(\frac{P_t}{P_{t+1}}\right)$$

$$\frac{B_t}{P_{t+1}} = E_{t+1}\sum_{j=0}^{\infty}\beta^j s_{t+1+j}$$

$$\frac{B_t}{P_t}\Delta E_{t+1}\left(\frac{P_t}{P_{t+1}}\right) = \Delta E_{t+1}\sum_{j=0}^{\infty}\beta^j s_{t+1+j}\,.$$

$$i_t \approx E_t\pi_{t+1}$$

$$\Delta E_{t+1}\pi_{t+1} \approx -\Delta E_{t+1}\sum_{j=0}^{\infty}\rho^j \tilde{s}_{t+1+j}$$

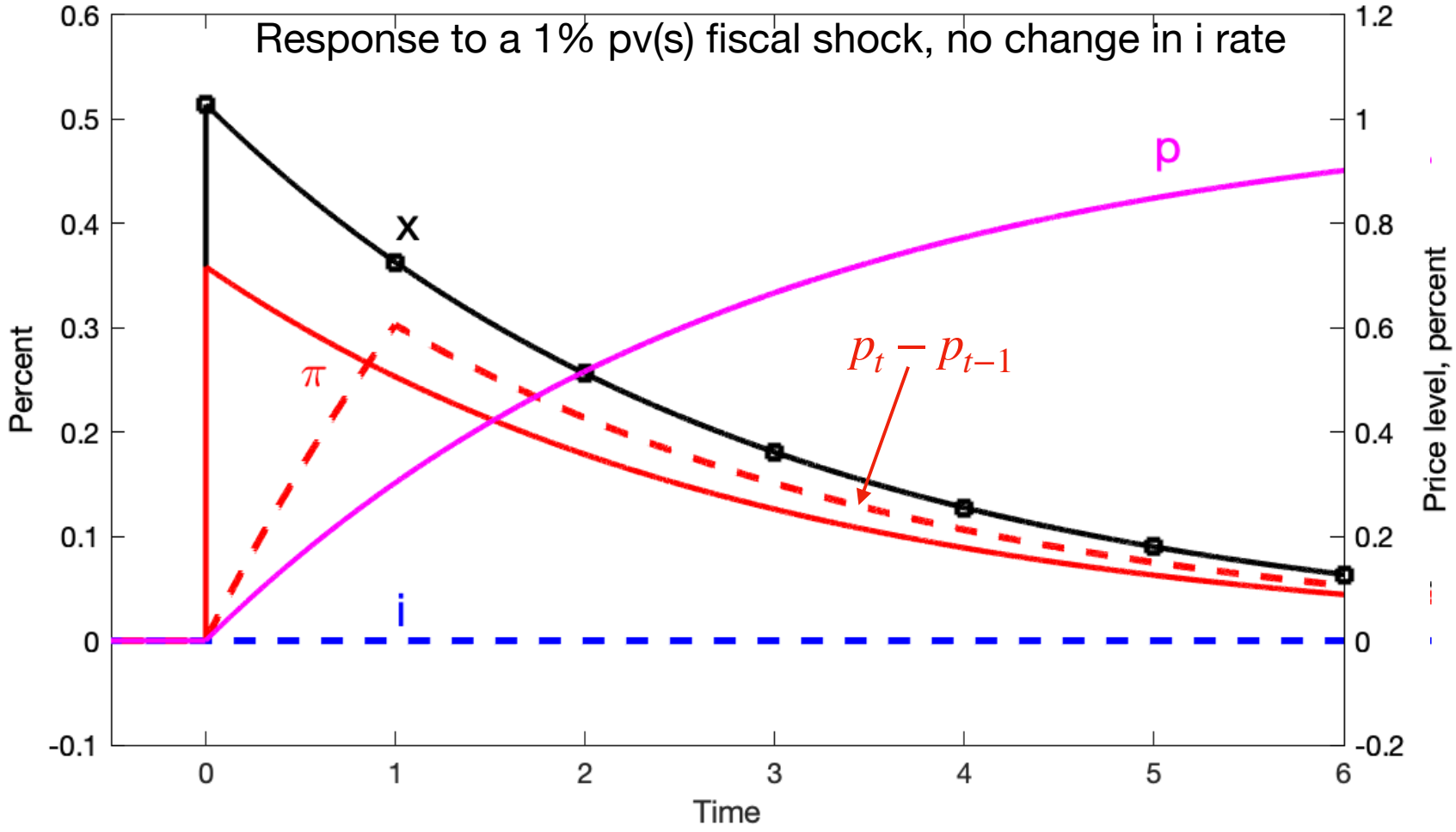
$$\left(\Delta E_{t+1} \equiv E_{t+1} - E_t;\quad \tilde{s}_t \equiv \frac{s_t}{B/P}\right)$$

- Central Bank sets expected inflation; fiscal policy determines unexpected inflation.
- Central Bank remains powerful! But can't stop all inflation.
- A (and the only) full, economic, theory of inflation under interest rate targets, consistent with current institutions (interest rate targets, no money supply, no "equilibrium selection" policy).
- Inflation is stable, determinate, long run neutral, even under a peg!
- Dynamics? Higher rates temporarily lower inflation? Sticky prices, etc….

Fiscal theory with sticky prices, fiscal shock

$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$
$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$
$$\rho v_{t+1} = v_t + i_t - \pi_{t+1} - \tilde{s}_{t+1}$$
$$0 = \lim_{T \to \infty} E_t \rho^T v_T$$

- No price level jump. Slowly inflate away debt. ($\pi > i$.)
- Inflation eventually goes away even with no i response.
- Very simple case! Much more generality is possible, including i rules, endogenous s, complex NK/DSGE etc.
- Recipe for writing papers.



Monetary shock. No fiscal change. Long term debt

$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$

$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$

$$\rho v_{t+1} = v_t + r^n_{t+1} - \pi_{t+1} - \tilde{s}_{t+1}$$

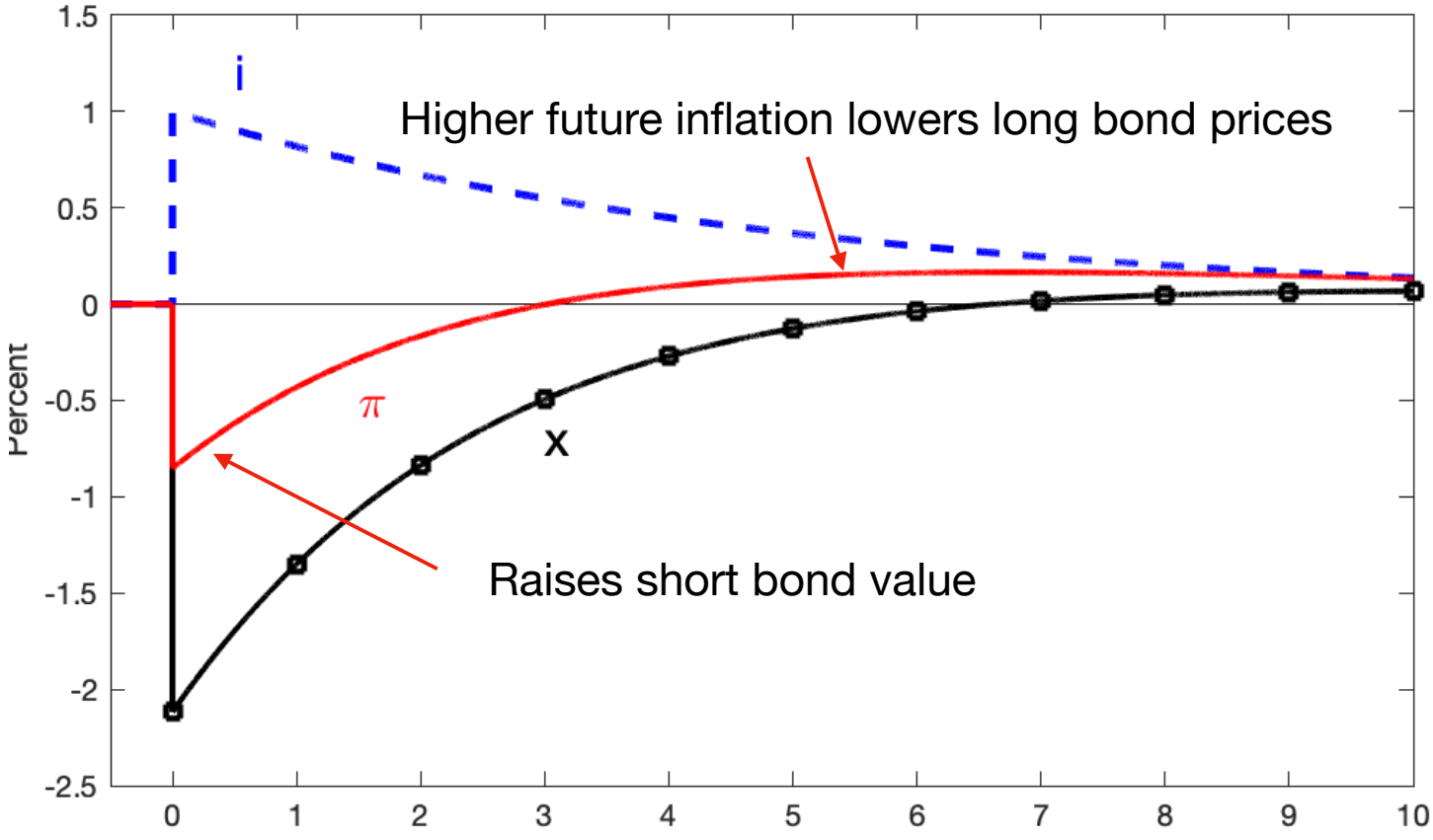
$$E_t r^n_{t+1} = i_t \quad \text{(new)}$$

$$r^n_{t+1} = \omega q_{t+1} - q_t$$

$$0 = \lim_{T \to \infty} E_t \rho^T v_T$$

- $(\sum_j Q_t^{(j)} B_{t-1}^{(j)})/P_t = E_t \sum_j \beta^j s_{t+j}$

  Higher i, future π = lower Q. Same s. P_t falls.
- Fed can only lower current by raising future inflation. ``Unpleasant interest rate arithmetic."
- Easy to miss the future inflation. ``stepping on a rake"
- *Not* standard intuition (higher rates lower demand, Phillips curve). Works (better) with flexible prices!

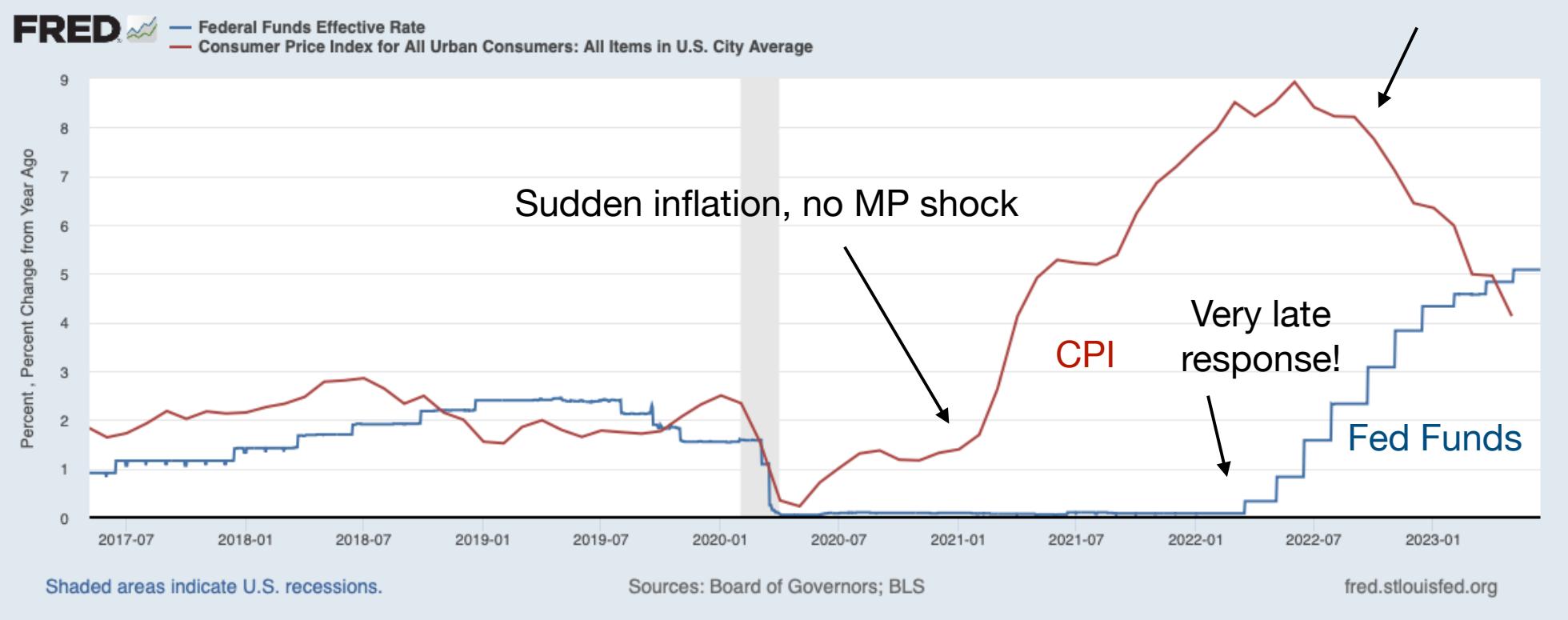


- Central banks can and should do this in response to a fiscal shock. Smoother inflation has less output effect.
- Taylor rule adds such a response automatically.

Act II: Current events

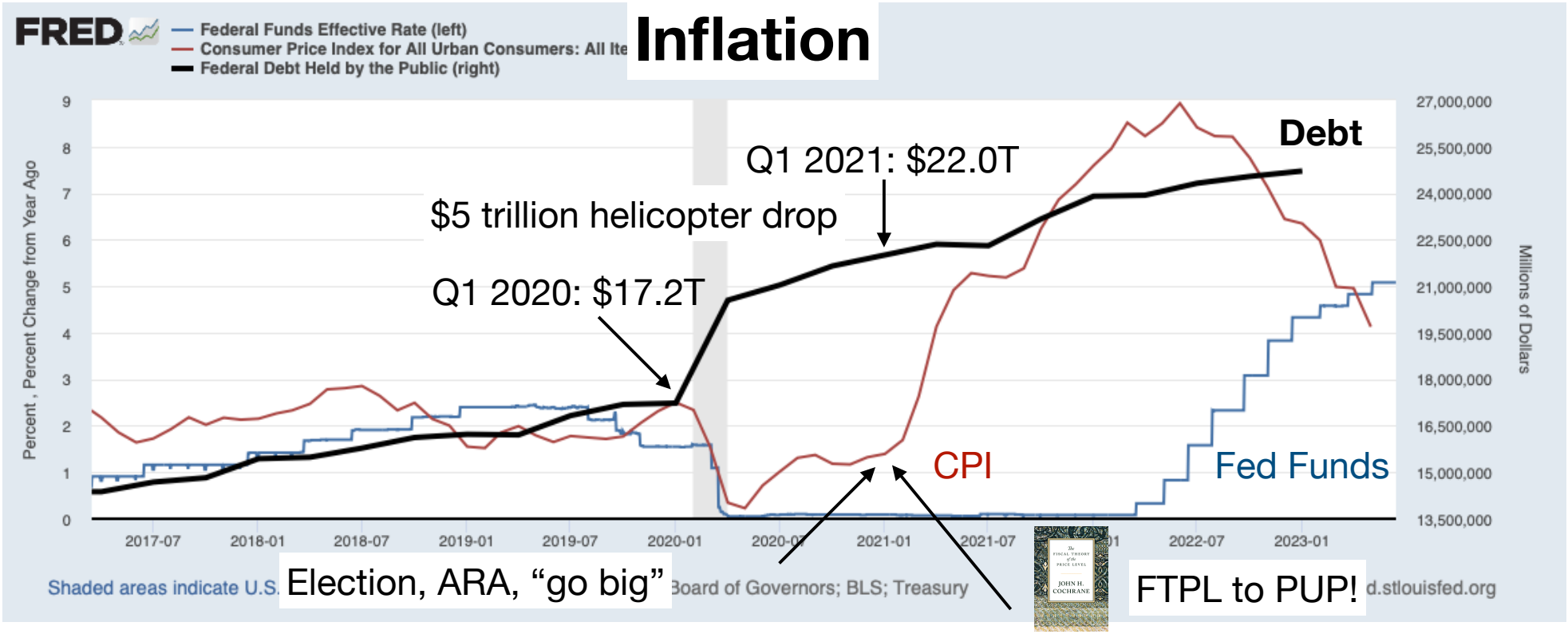
Inflation

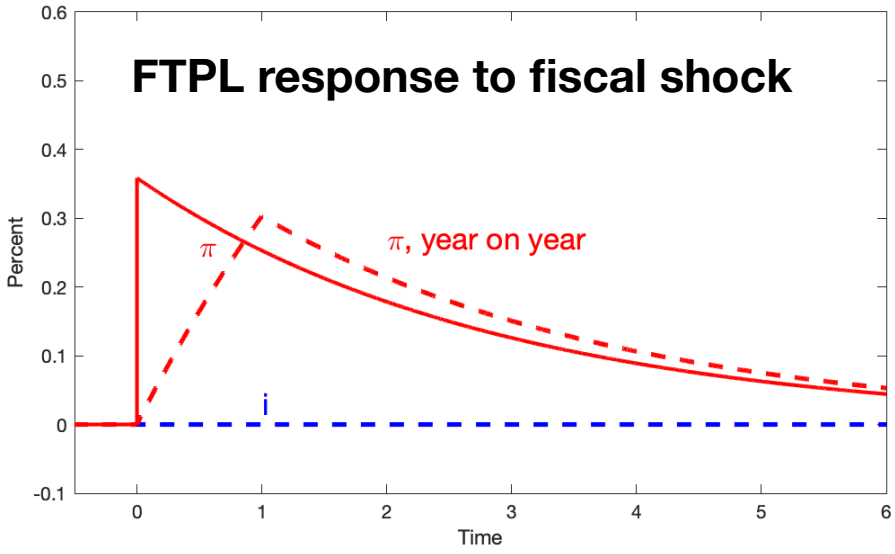
Inflation eases, no 1980s $i > \pi$



- Why did inflation start?
- "Greed," "supply shocks," "monopoly" are *relative* prices.
- Why does inflation plateau and ease, not spiral, with $i < \pi$?

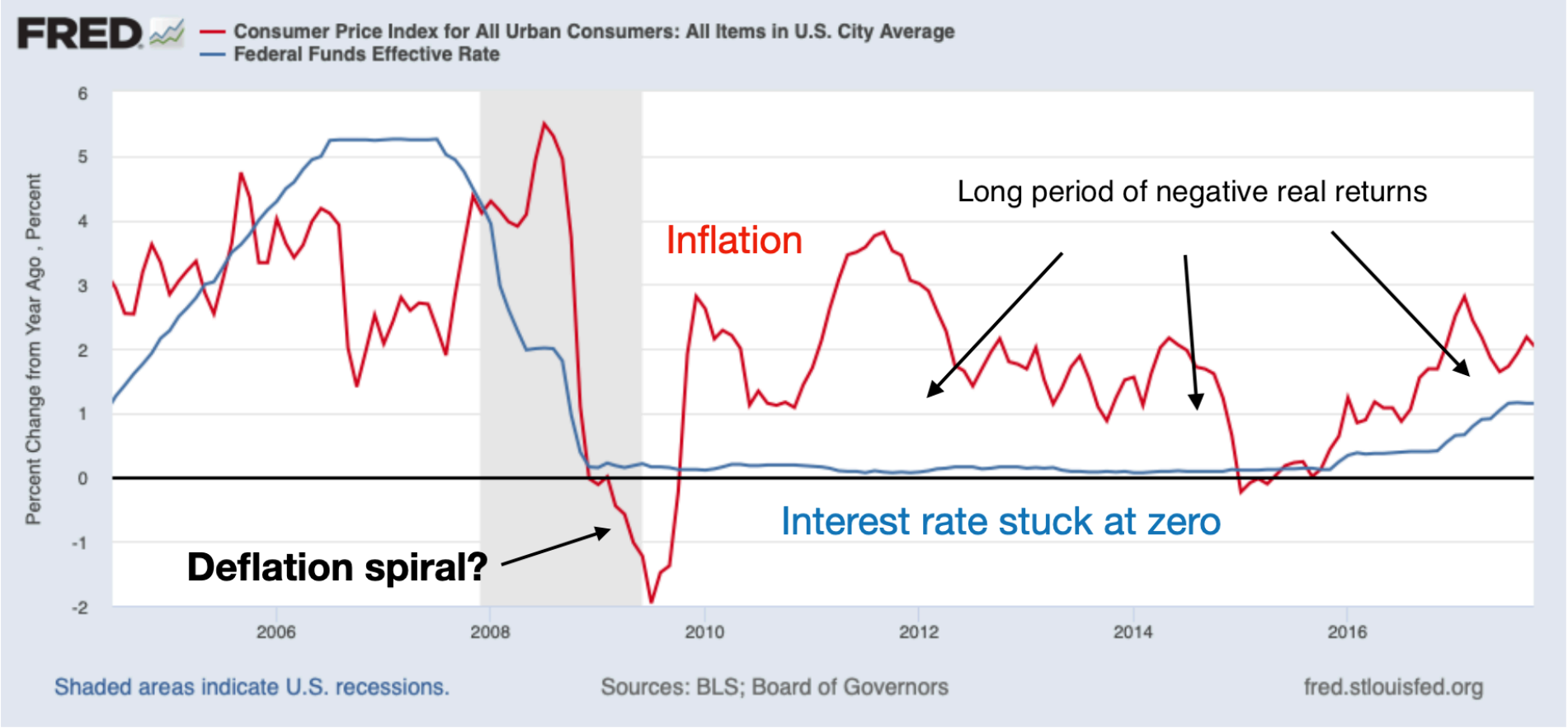
Inflation





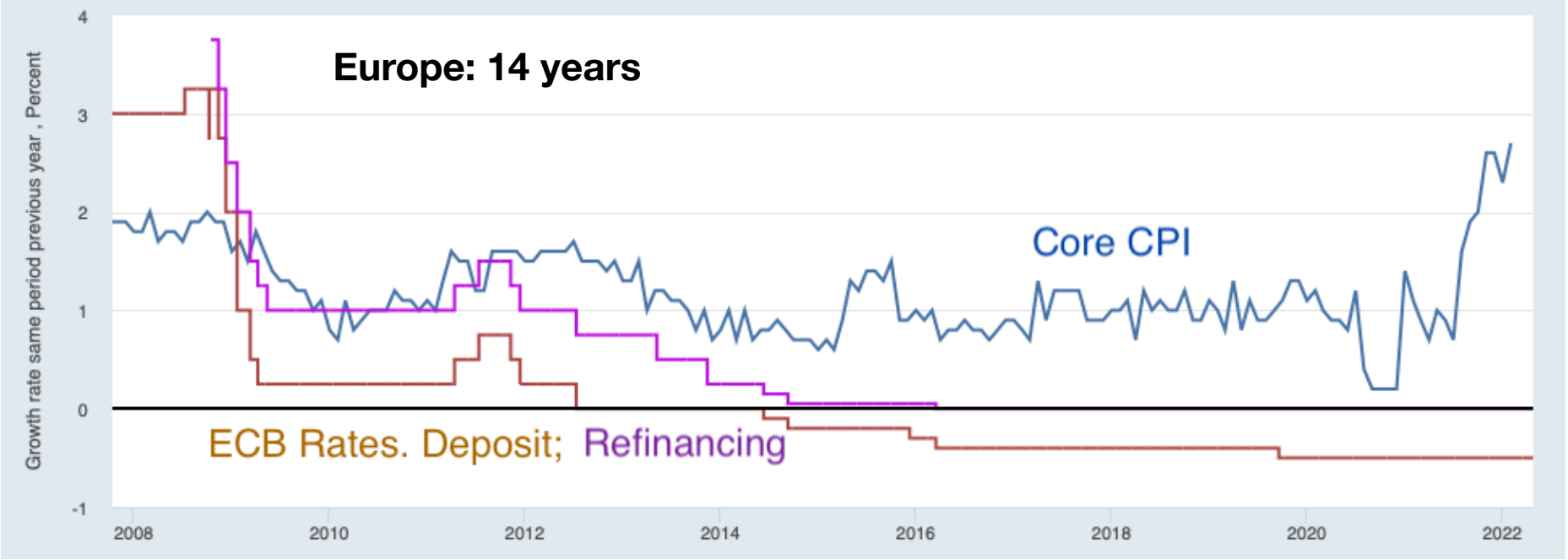
- +$5T debt. ($3T reserves). Checks to people, businesses.
- No "deficit now, repayment later." No lower real rates.
- M? Same QE did not produce π.
- Evidently, people did not save reserves/debt as a good investment.
- Easing just as rates start to rise, as in model. Persistent inflation?

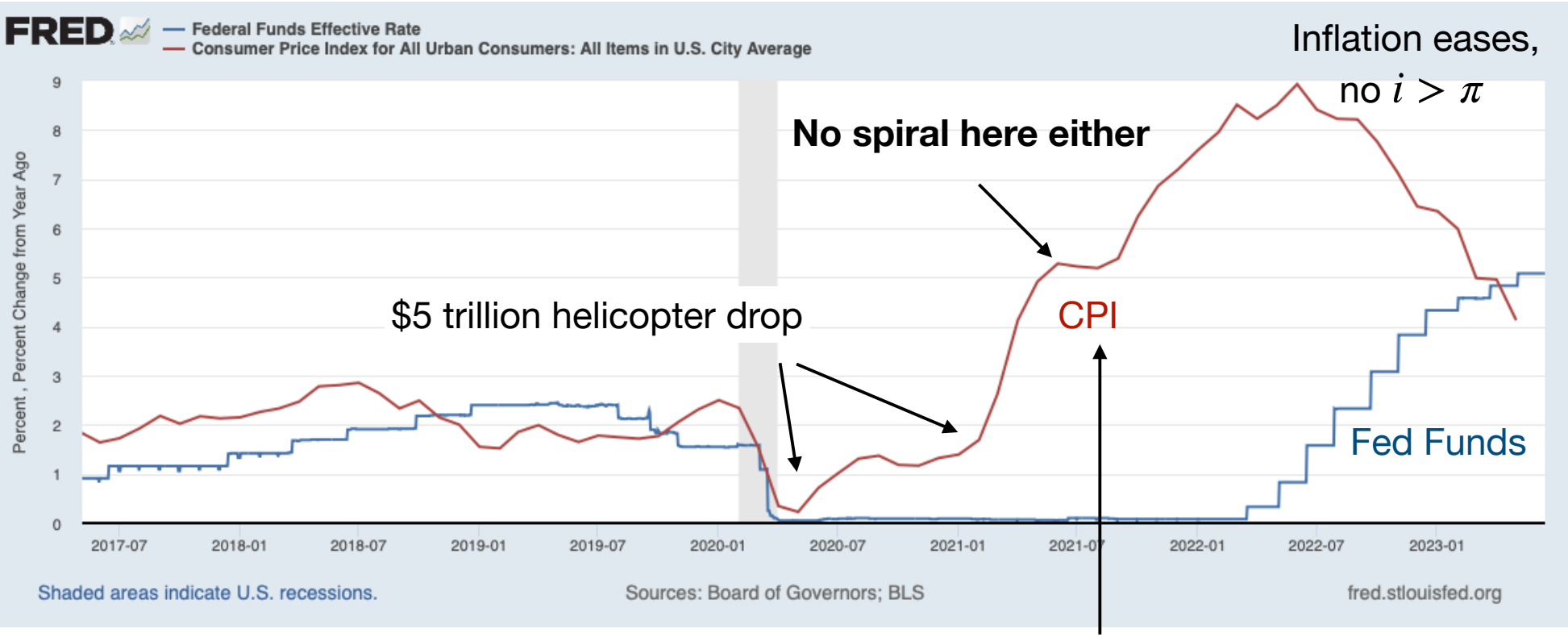
A test of theories: 2008 and zero bound

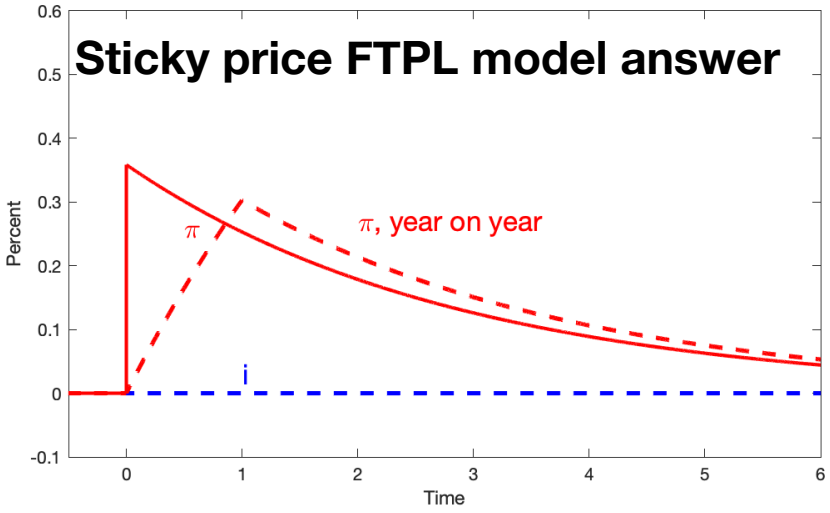


- 2008/2009: No big deflation, though widely predicted. Debt/price = EPV(surplus). No deflation because of *fiscal* policy.
- Long zero bound: no spiral, no sunspots, though widely predicted. Only FTPL: inflation *can be* stable, quiet at ZLB.
- Immense QE: No monetary hyperinflation, though widely predicted.
- Fiscal? Not great, but no *news*. Unexpectedly low interest rates/costs.

The long quiet stable zero bound







- Adaptive: Inflation will spiral up until $i > \pi$.
- NK model: Central bank can completely control inflation. $i_t = \phi(\pi_t - \pi_t^*)$, $\phi > 1$. There cannot be a fiscal shock, as "passive" fiscal policy always changes s_{t+j} so that $B_{t-1}/P_t = EPV(s)$ after CB chooses P_t .
- →Inflation broke out because the Fed did not announce an equilibrium-selection policy and threaten hyperinflation should inflation exceed its target. ??

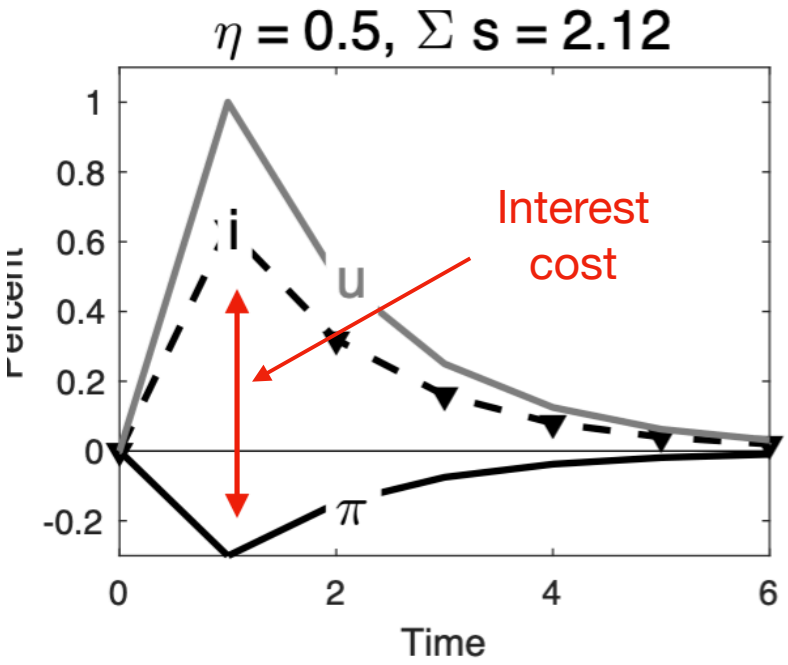
Act III.
Fiscal - monetary interaction

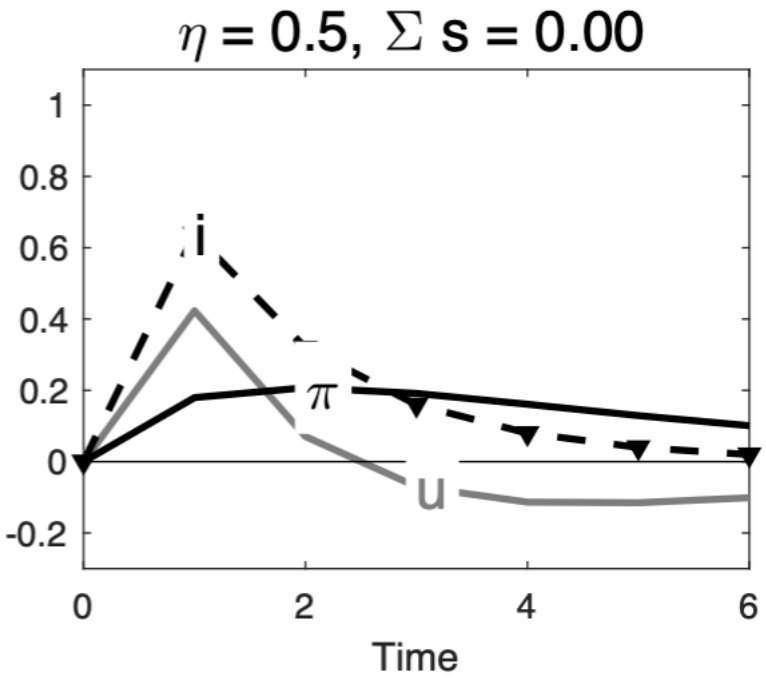
- Higher interest rates?
  - Higher interest costs on debt. 100% Debt/GDP; 1% rate = 1% of GDP deficits
  - Disinflation: bondholder windfall.
  - Recession: bailout, stimulus, etc.
- Conventional models include joint fiscal / monetary tightening.
- Can (how?) interest rates lower inflation without fiscal tightening?
  - How much is “monetary policy” vs induced fiscal?
  - What happens today if governments refuse / are unable fiscal tightening to support monetary policy?
- *Higher interest rates without fiscal tightening **raise** inflation. This is true in conventional new and old Keynesian models too.*
- Containing inflation requires joint fiscal monetary (and usually growth-oriented microeconomic) policy.

Standard new-Keynesian model

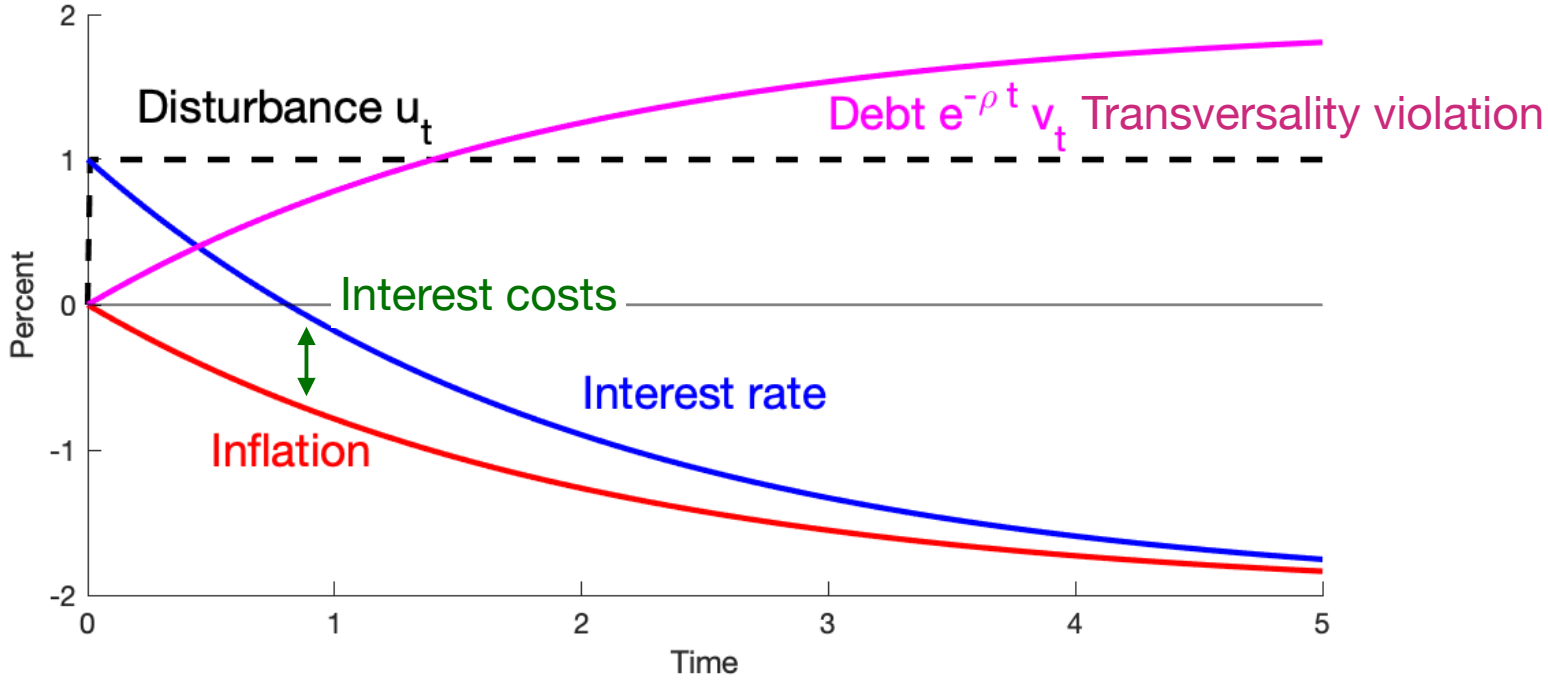
$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$
$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$
$$i_t = \phi \pi_t + u_t;\ \phi > 1$$
$$u_{t+1} = \eta u_t + \varepsilon_{t+1}$$
$$\rho v_{t+1} = v_t + i_t - \pi_{t+1} - \tilde{s}_{t+1}$$ "Passive"

- NK model with a transitory AR(1) shock lowers inflation.
- But "passive" fiscal raises taxes to pay interest cost & bondholder windfall.
- Choose $\{u_t\}$(not AR(1)) to give the *same* i path, no fiscal change: *Inflation rises*! (Roughly, $i_t - \pi_{t+1}$ averages zero).
- NK inflation reduction comes from equilibrium selection, with "passive" fiscal tightening! *Despite* higher rates, not *because* of higher rates.
- Without fiscal shock, *higher rates do not lower inflation in the standard NK model!*





Fiscal foundations of adaptive expectations /old Keynesian

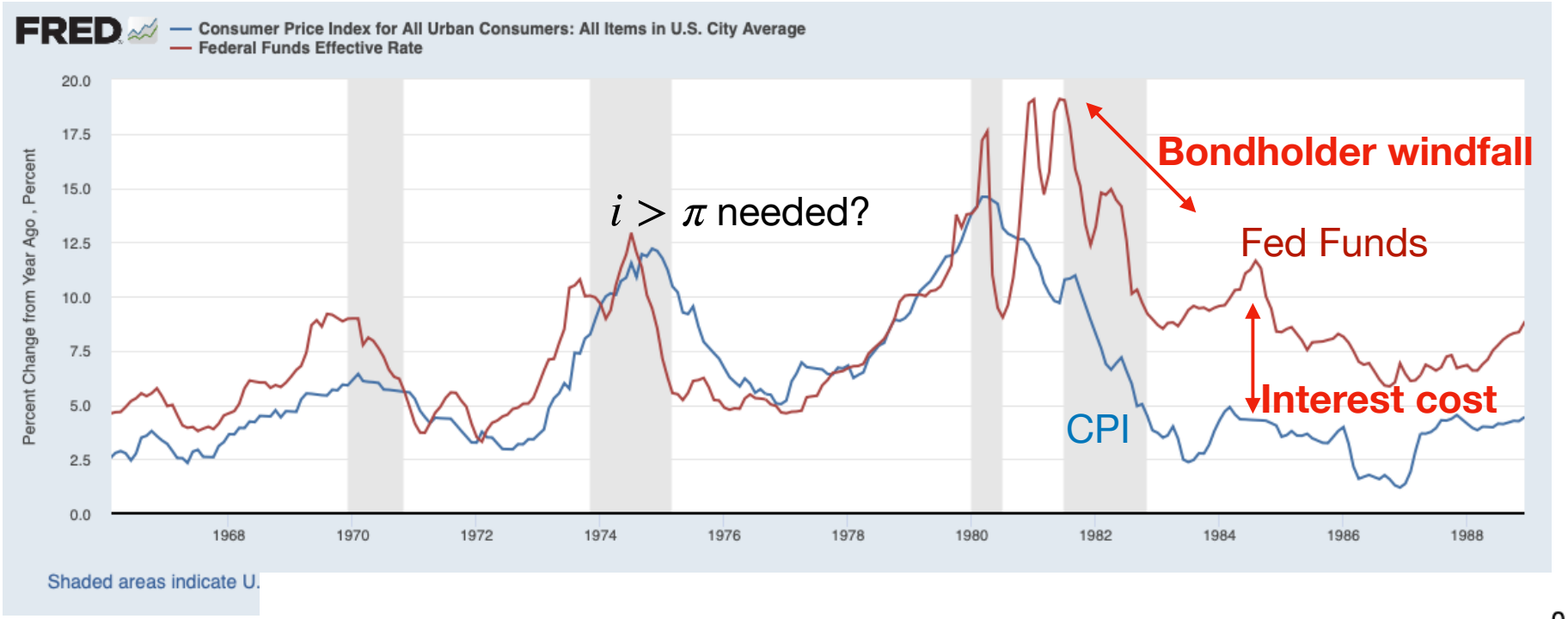


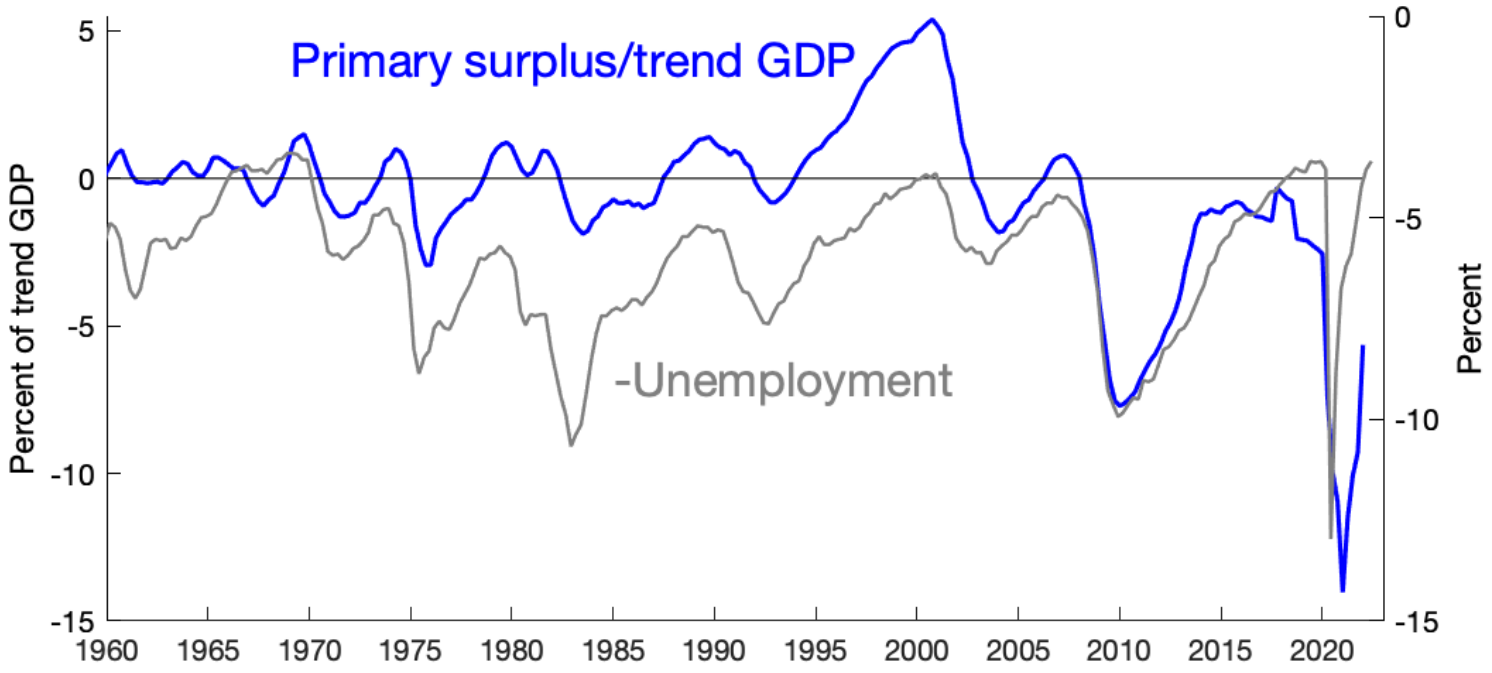
- Disinflation requires fiscal tightening to pay interest costs on debt.
- Paper: Interest rates with no change in fiscal policy *cannot* change long-run inflation. Adaptive expectations doesn't work either!
- Intuition: pv of real interest cost on debt = 0 → average real interest to move inflation = 0.
- $0 = \int_0^\infty e^{-rj} r_j dj;\ \pi_\infty = -\sigma\kappa \int_0^\infty r_j dj\,.$

$$x_t = -\sigma(i_t - \pi_{t-1})$$
$$\pi_t = \pi_{t-1} + \kappa x_t$$
$$\rho v_{t+1} = v_t + i_t - \pi_{t+1}$$
$$i_t = \phi\pi_t + u_t$$
$$\sigma\kappa = 1;\ \phi = 1.5;$$
$$\rho = 0.99$$

(Continuous time)

1980s were a joint monetary, fiscal, and microeconomic disinflation

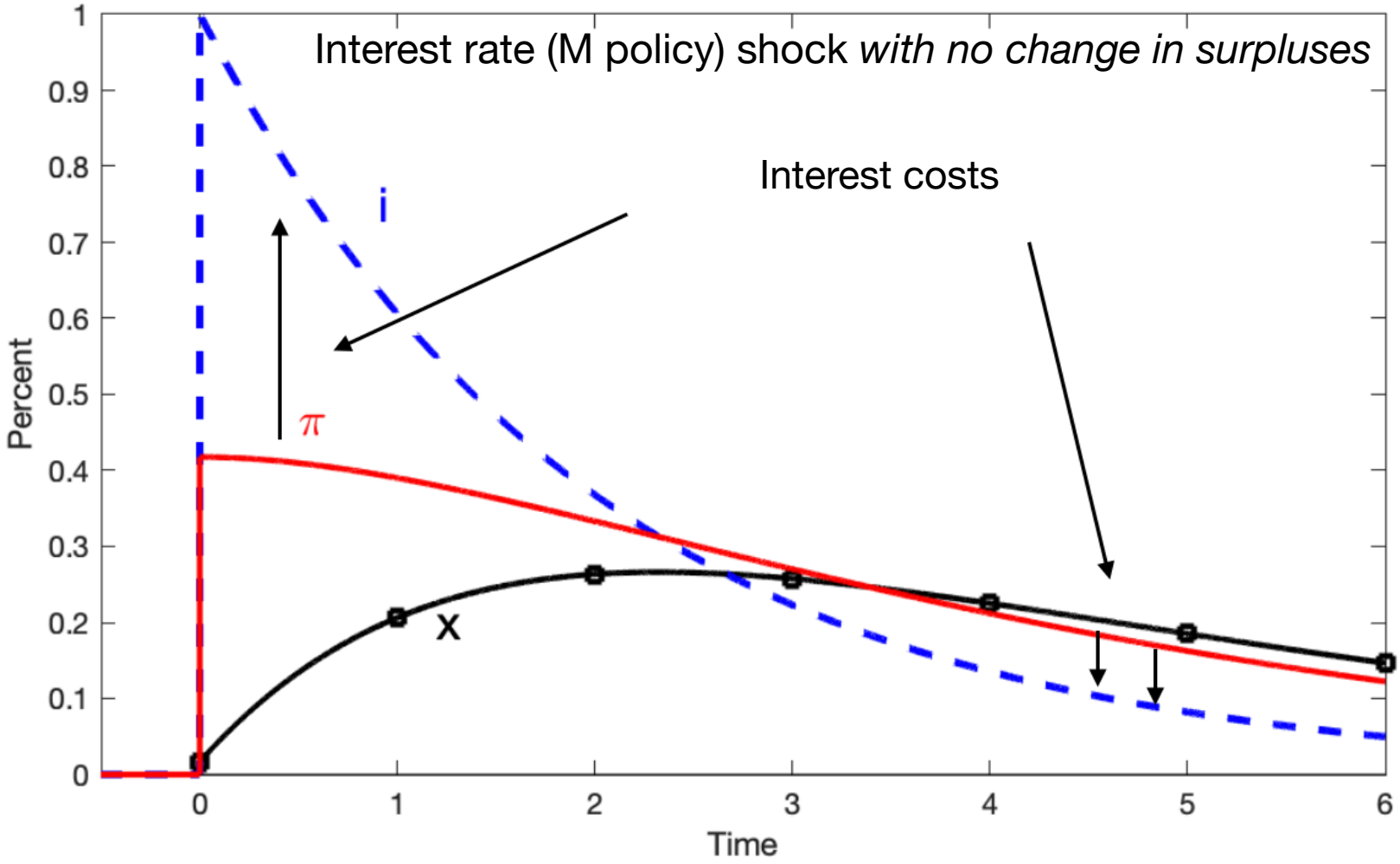




Fiscal theory with price stickiness, short debt

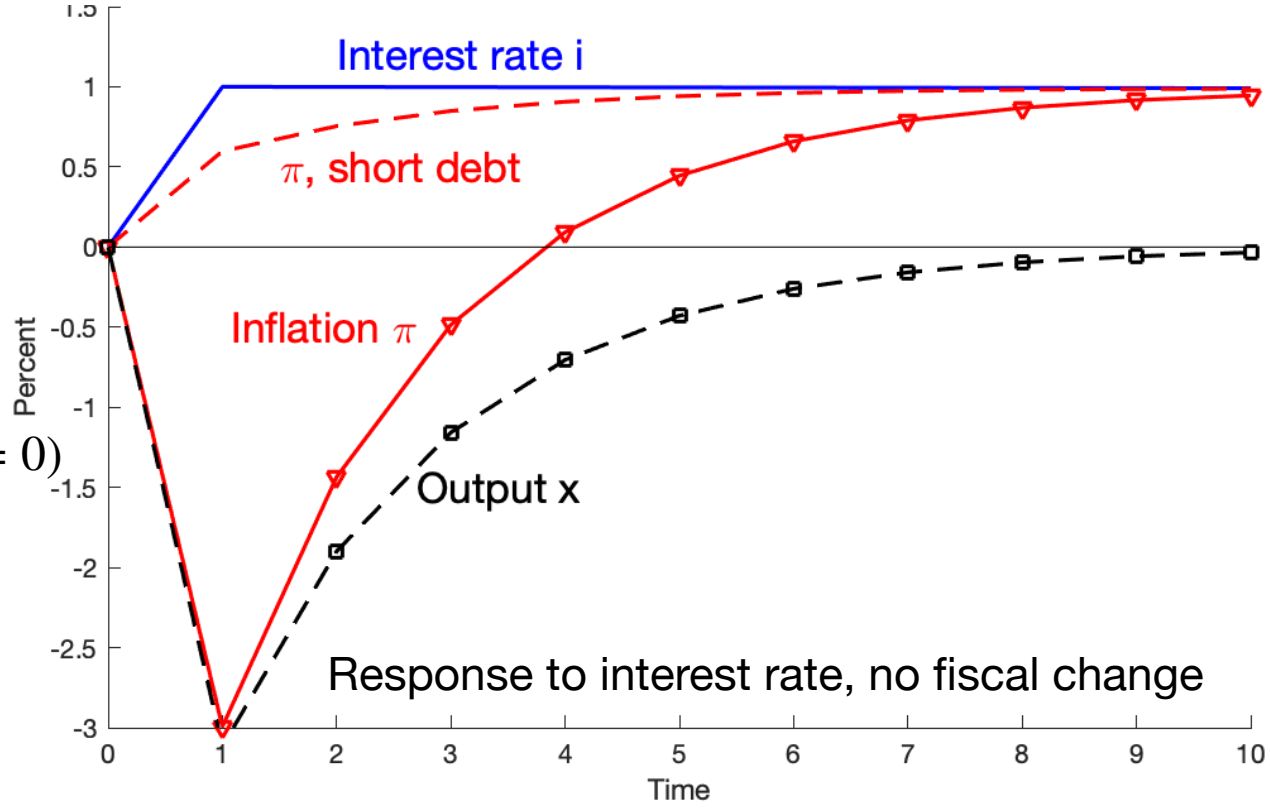
$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$
$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$
$$\rho v_{t+1} = v_t + i_t - \pi_{t+1} - \tilde{s}_{t+1}$$
$$0 = \lim_{T \to \infty} E_t \rho^T v_T$$

- Definition of "monetary policy" shock: Interest rate change *with no change in surpluses*.
- Inflation still *rises* despite sticky prices.
- Pv(interest costs) = Pv(surpluses) = 0.



The imperfect best we have so far (without fiscal help)

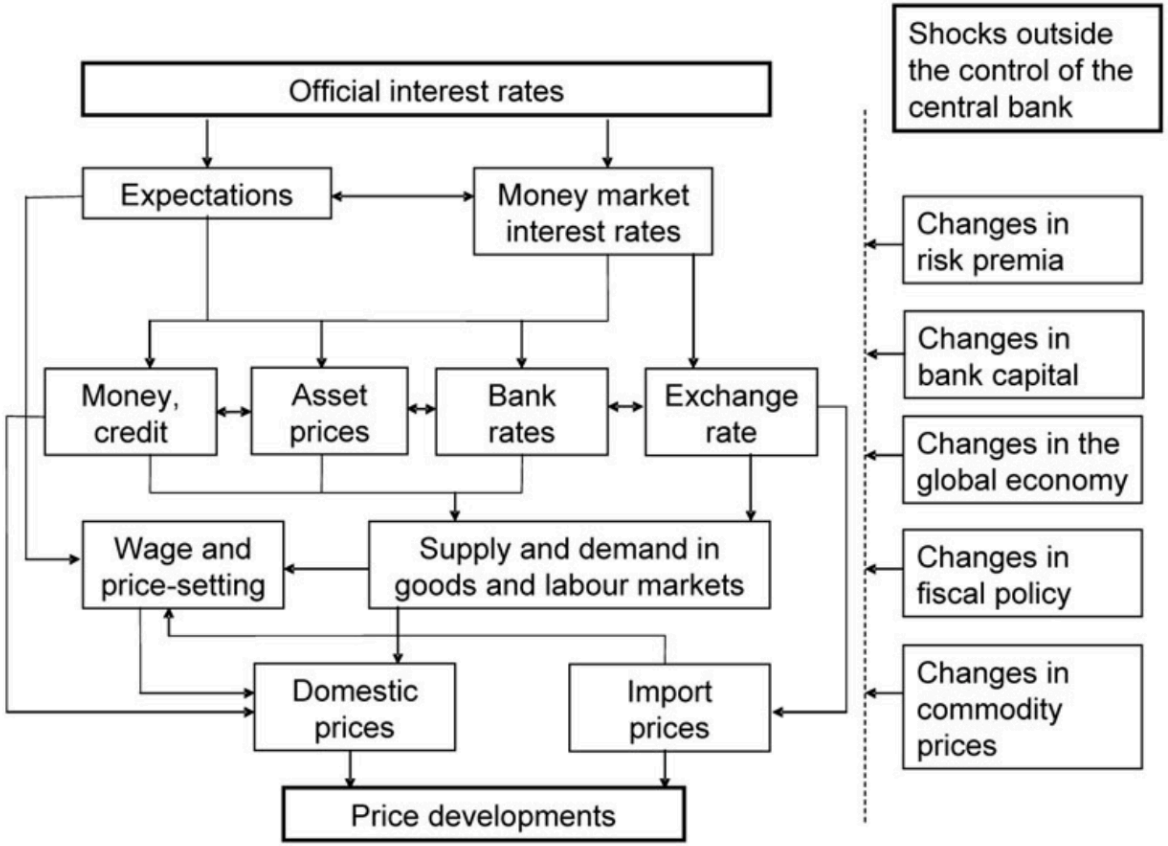
$$x_t = E_t x_{t+1} - 0.5(i_t - E_t \pi_{t+1})$$
$$\pi_t = E_t \pi_{t+1} + 0.5 x_t$$
$$i_t = i_{t-1} + \varepsilon_{i,t}$$
$$\rho v_{t+1} = v_t + r^n_{t+1} - \pi_{t+1} - (\tilde{s}_{t+1} = 0)$$
$$E_t r^n_{t+1} = i_t$$
$$r^n_{t+1} = 0.9 q_{t+1} - q_t .$$



- Only ``unpleasant arithmetic," move inflation around; Only unexpected rate rises; Only with long term debt, weaker for short debt. More for longer-lasting rate rises, weaker for transitory rises. *Less* for more sticky prices.
- Works by reallocating wealth among bond holders. Not Sticky prices, raise real rates, lower AD, Phillips curve. On central bank websites / speeches?
- A better model? Empirical work for how rates without fiscal help affect inflation? Or, maybe this is it!

What we definitely do not know, courtesy ECB

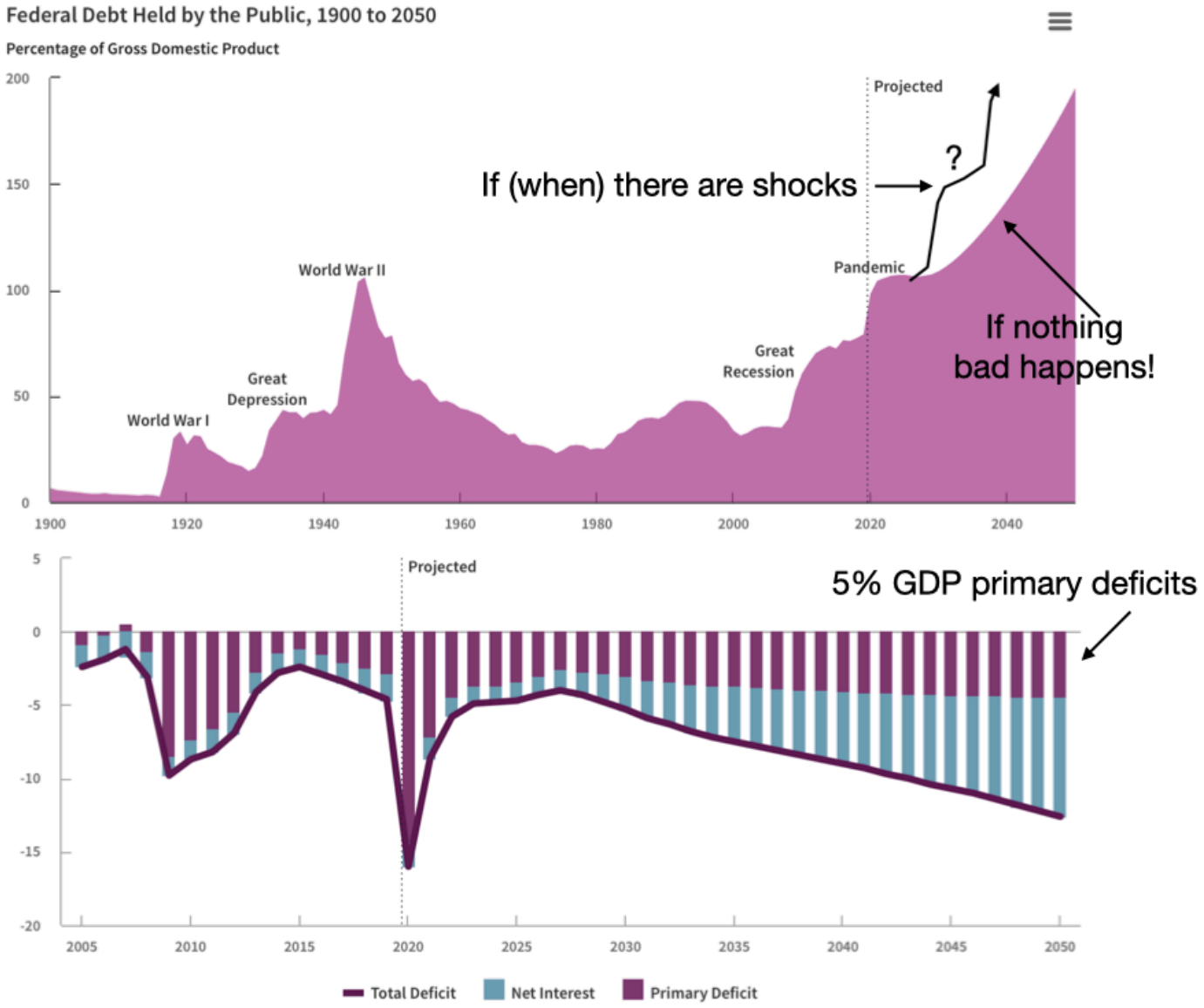
The chart below provides a schematic illustration of the main transmission channels of monetary policy decisions.



Source: https://www.ecb.europa.eu/mopo/intro/transmission/html/index.en.html

The fiscal future

- CBO: Projection, not expectation. Evidently, people don't think this will happen.
- Danger 1: People lose faith that it will get fixed.
- Danger 2: Next big shock?
- Note: inflation / default will not solve the main problem, future spending!



Inflation's important lessons

Conventional wisdoms now wrong:

- Demand; not supply, productivity for growth. Secular stagnation, fiscal stimulus.
- MMT, r<g, "go big," debt need not be repaid.
- Endless appetite for debt. Debt doesn't matter.
- Endless low real rates, interest costs.
- "Jobs" are now a cost, not a benefit.

More?

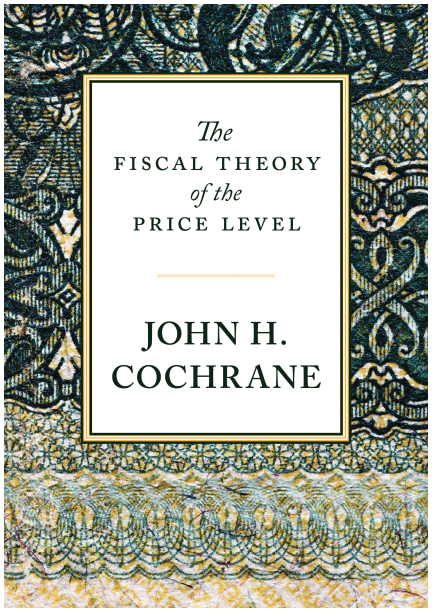
- *The Fiscal Theory of the Price Level*

  Book. Theory, institutions, intuition.
- "Fiscal Histories." J Economic Perspectives.

  No equations, current and historical episodes.
- "Expectations and the Neutrality of Interest Rates"

  Simple theories of inflation with interest rate targets. Stability, determinacy, rates and inflation. FTPL is the only one we have! Higher rates lower inflation is hard.
- "Interest rates and inflation" *Grumpy Economist.*

  Higher rates lower inflation is hard even in standard models. We have no respectable model of central bank beliefs, "long and variable lags."
- Video, talks, more essays/papers, news, sample chapters, appendix, revisions: johnhcochrane.com



The End

(Extra slides for questions)

Requests for generality

$$
\begin{aligned}
x_t &= E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1}) \\
\pi_t &= \beta E_t \pi_{t+1} + \kappa x_t \\
i_t &= \theta_{i\pi} \pi_t + \theta_{ix} x_t + u_{i,t} \\
\tilde{s}_{t+1} &= \theta_{s\pi} \pi_{t+1} + \theta_{sx} x_{t+1} + \alpha v_t^* + u_{s,t+1} \\
\rho v_{t+1}^* &= v_t^* + r_{t+1}^n - \pi_{t+1}^* - \tilde{s}_{t+1} \\
\rho v_{t+1} &= v_t + r_{t+1}^n - \pi_{t+1} - \tilde{s}_{t+1} \\
E_t \pi_{t+1}^* &= E_t \pi_{t+1} \\
\Delta E_{t+1} \pi_{t+1}^* &= -\beta_s \varepsilon_{s,t+1} - \beta_i \varepsilon_{i,t+1} \\
E_t r_{t+1}^n &= i_t \\
r_{t+1}^n &= \omega q_{t+1} - q_t \\
u_{i,t+1} &= \eta_i u_{i,t} + \varepsilon_{i,t+1} \\
u_{s,t+1} &= \eta_s u_{s,t} + \varepsilon_{s,t+1} \,.
\end{aligned}
$$

Fiscal and monetary rules; Endogenous surpluses

Surpluses rise to pay off debts, but still active fiscal policy

(What about money?)

Theory

- Cash and reserves are government debt.
- Yes, $5 trillion from helicopters = inflation…
- What if you get $5 trillion but give up $5 trillion Treasury bonds? QE did not cause inflation!
- Composition vs. overall quantity of debt. “Wealth” vs. “portfolio” effect. Backing vs. liquidity demand + limited supply.

Apply to our world

- *Fed sets interest rate, not money supply.*
- There are no reserve requirements, limits on inside money.
- M? $3-4 trillion reserves pay market interest. Money and bonds are nearly perfect substitutes.
- Great theory, but MV=PY does not apply to current institutions. Like gold.
- We need *a theory of inflation under interest rate targets, with no money supply control.*

Expectations and the neutrality of interest rates

- Goal: Better model of how interest rates affect inflation. FTPL + NK/ DSGE. Ends up needing back to basics.
- What is our basic theory of inflation under interest rate targets, with no money supply control, ~~MV=PY~~?
- Which minimal central frictions do we need on top of that?
- Do / how do higher nominal rates lower inflation?
- Essay: Analogy to Lucas 1972 “Expectations and the neutrality of money.”

Theory of inflation under interest rate targets

Model $x_t = E_t x_{t+1} - \sigma(i_t - \pi_t^e)$

$\pi_t = \pi_t^e + \kappa x_t$

Inflation dynamics $\pi_t = (1 + \sigma\kappa)\pi_t^e - \sigma\kappa i_t$.

(> 1, < 0)

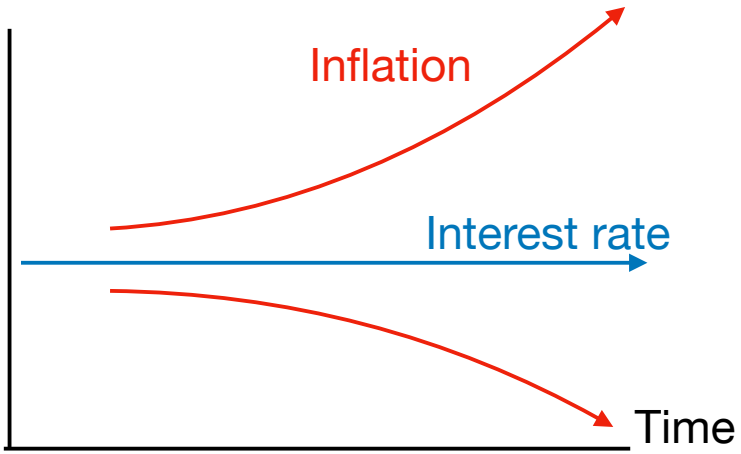
1) Adaptive Expectations $\pi_t^e = \pi_{t-1} \quad \rightarrow \quad \pi_t = (1 + \sigma\kappa)\pi_{t-1} - \sigma\kappa i_t$.

a) Friedman (1968): i peg is *unstable.* Inflation/deflation spirals.

b) Taylor rule + adaptive

$$i_t = \phi\pi_t \quad \rightarrow \quad \pi_t = \frac{1 + \sigma\kappa}{1 + \sigma\kappa\phi}\pi_{t-1} .$$

Fed stabilizes inflation with adaptive E.



c) Higher rates lower (future) inflation. Captures common policy/pundit beliefs.

But… Adaptive expectations always and everywhere, *necessary minimal* component?

Expectations *of* the model ≠ expectations *in* the model?

There *is no* simple, rational theory for the basic sign and operation of monetary policy?

Theory of inflation under interest rate targets

Model $x_t = E_t x_{t+1} - \sigma(i_t - \pi_t^e)$

$\pi_t = \pi_t^e + \kappa x_t$

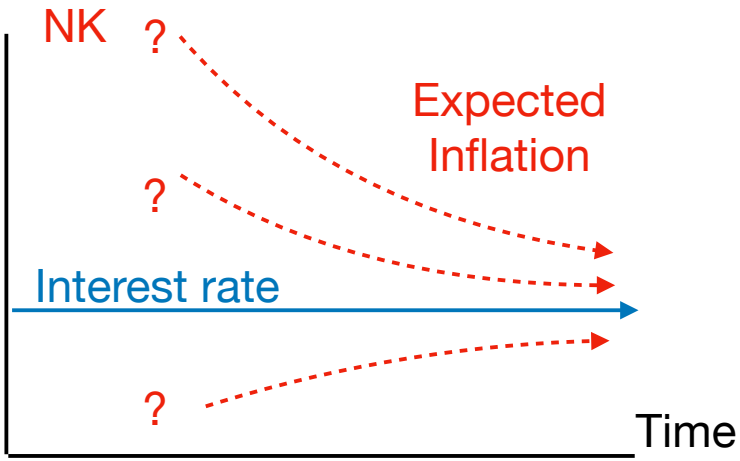
Inflation dynamics $\pi_t = (1 + \sigma\kappa)\pi_t^e - \sigma\kappa i_t$.

2) Rational expectations $\pi^e = E_t\pi_{t+1} \quad \rightarrow \quad E_t\pi_{t+1} = \frac{1}{1+\sigma\kappa}\pi_t + \frac{\sigma\kappa}{1+\sigma\kappa} i_t$ (< 1, > 0)

a) Sargent-Wallace (1975): Inflation is *stable*, but *indeterminate* under a peg.

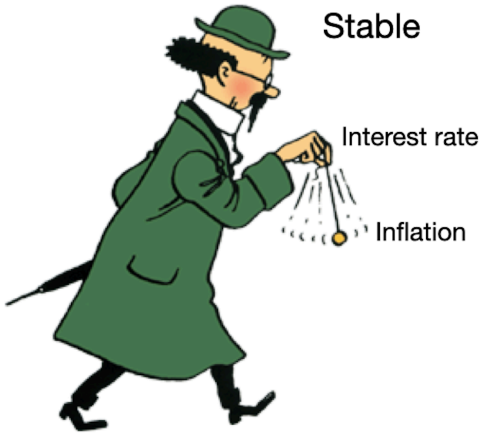
b) New-Keynesian.

$$i_t = \phi\pi_t \quad \rightarrow \quad E_t\pi_{t+1} = \frac{1+\phi\sigma\kappa}{1+\sigma\kappa}\pi_t$$



- Central bank *destabilizes* inflation to select equilibria. Opposite of adaptive model.
- Central banks don't do that.

c) Higher interest rates *raise* inflation unless there is a jump to a different equilibrium. Lower inflation comes from equilibrium selection.



New-Keynesian equilibrium selection

Flex price model for really simple algebra:

$$i_t = E_t \pi_{t+1}$$
$$i_t = \phi \pi_t + u_t = i_t^* + \phi(\pi_t - \pi_t^*)$$
$$i_t^* = E_t \pi_{t+1}^*$$

Equilibrium:

$$E_t(\pi_{t+1} - \pi_{t+1}^*) = \phi(\pi_t - \pi_t^*)$$

$i_t = i_t^*;\ \pi_t = \pi_t^*$ is the unique non-explosive (locally bounded) equilibrium.

- Central bank picks inflation target $\{\pi_t^*\}$. Implement with an *interest rate policy* $i_t^* = E_t \pi_{t+1}^*$ (observed) that sets expected inflation, and a separate *equilibrium selection policy* (unobserved off-equilibrium threats) destabilizing the economy for all but one unexpected inflation.
- The central bank *fully* determines inflation.
- *Central banks don't do this.* Like MV=PY, gold, another beautiful theory that does not apply to current institutions.
- Whether interest raise or lower inflation depends entirely on equilibrium selection.
- "Open mouth" operation. Iid $\{\pi_t^*\}$, i_t is constant, π_t is any desired iid process!

Theory of inflation under interest rate targets

Model $x_t = E_t x_{t+1} - \sigma(i_t - \pi_t^e)$

$\pi_t = \pi_t^e + \kappa x_t$

Inflation dynamics $\pi_t = (1 + \sigma\kappa)\pi_t^e - \sigma\kappa i_t$.

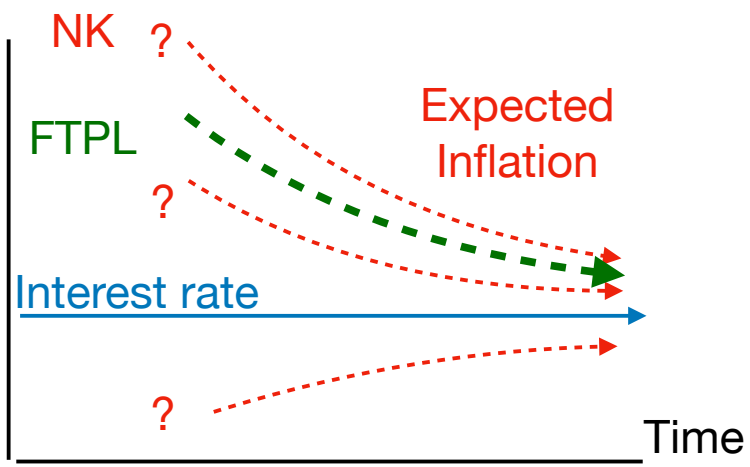
($1 + \sigma\kappa$: < 1; $\sigma\kappa$: > 0)

2) Rational expectations $\pi^e = E_t\pi_{t+1} \quad \rightarrow \quad E_t\pi_{t+1} = \frac{1}{1+\sigma\kappa}\pi_t + \frac{\sigma\kappa}{1+\sigma\kappa} i_t$

c) Fiscal theory of the price level

$$\Delta E_{t+1}\pi_{t+1} = \Delta E_{t+1} \sum_{j=0}^{\infty} \rho^j(-\tilde{s}_{t+1+j} + r_{t+1+j}); \quad \Delta E_{t+1} \equiv E_{t+1} - E_t$$

- **Inflation is *stable* and *determinate* (at last); obeys *long-run neutrality*.**
- **A complete theory of inflation under an interest rate target, like MV=PY, but consistent with today's institutions.**
- **The only such theory we have! "Test?"**



d) Issues:

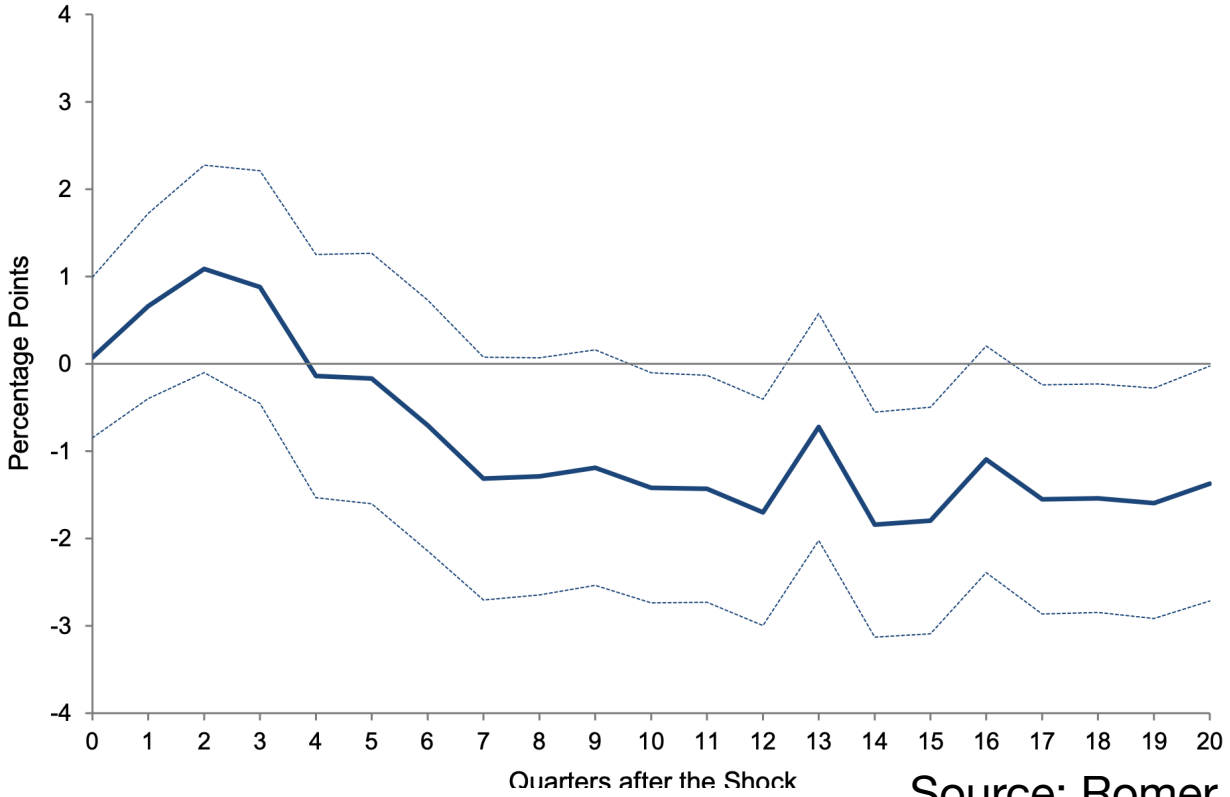
- *Is* inflation stable/determinate under a peg?
- Do higher interest rates raise/lower inflation?

Scene II: Can higher interest rates replicate policy beliefs — long lags — even with required fiscal policy tightening?

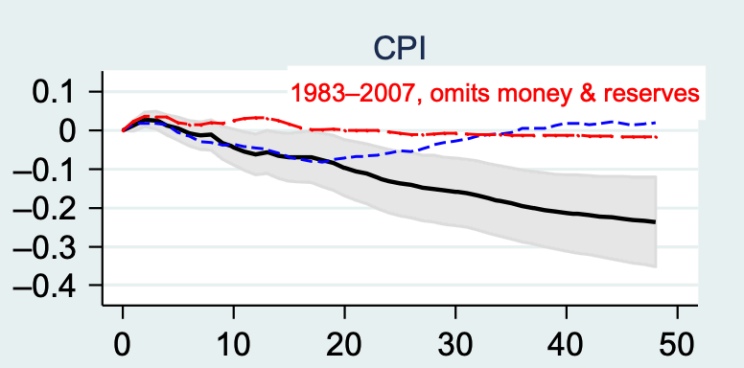
Interest rates and inflation in conventional models

- What is the (is there a) simplest baseline economically respectable model, even ignoring fiscal issues, that replicates standard policy beliefs & VARs?
- Standard beliefs: Higher rates slowly reduce *future* inflation.
- Standard story: Higher nominal rates → inflation sticky, higher real rates → (lag) lower output, employment → (lag) lower future inflation.

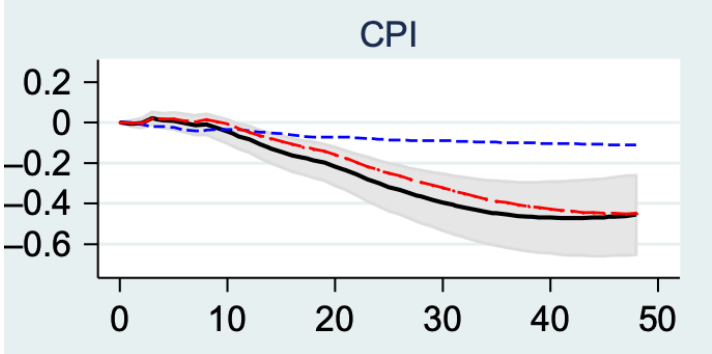
FIGURE 5. RESPONSE OF GDP PRICE INDEX INFLATION TO A MONETARY POLICY SHOCK



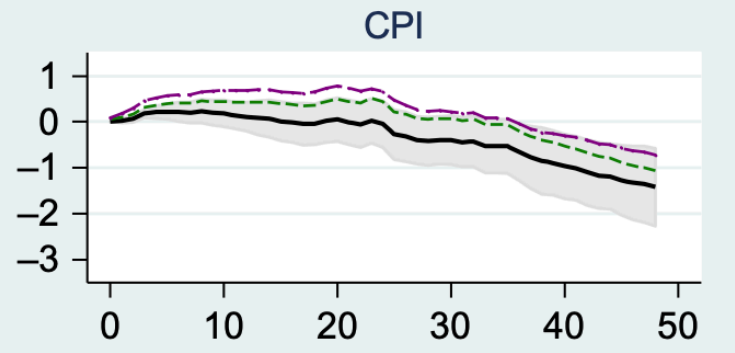
Source: Romer and Romer



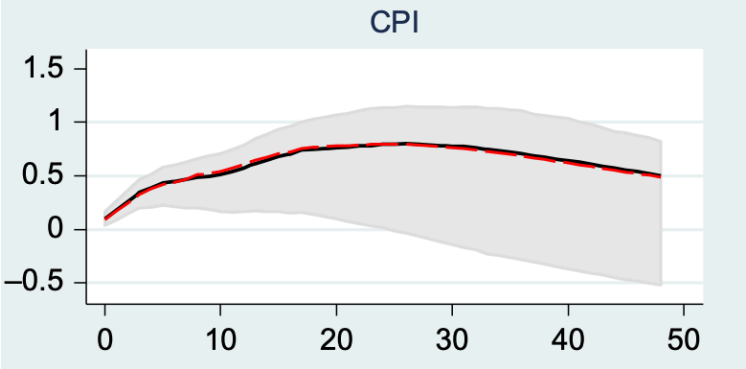
CEE identification



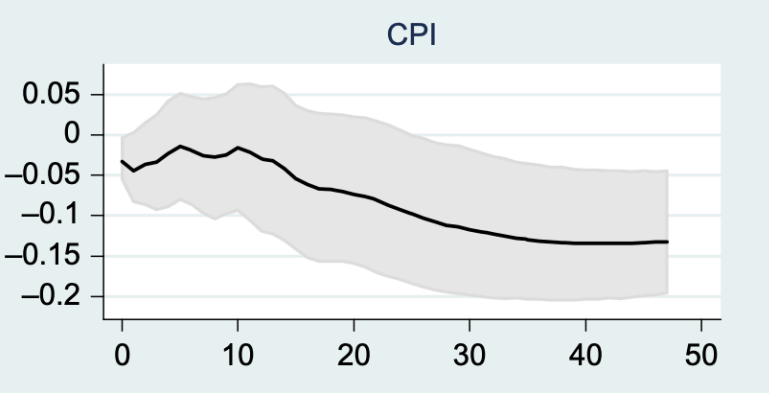
Romer and Romer identification, VAR



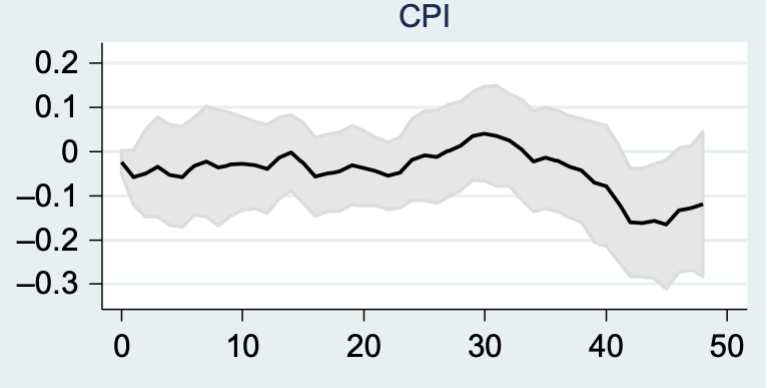
R&R, regression (local projection)



R&R, proxy SVAR



Gertler Karadi VAR



Gertler Karadi, regression

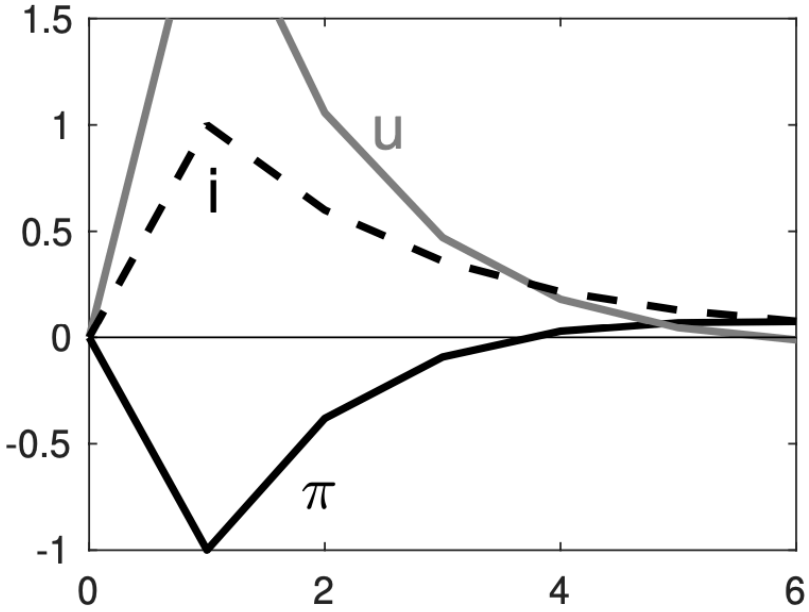
Source: Ramey (2016)

Interest rates and inflation — standard NK model

Belief
Higher rates slowly lower *future* inflation

Model:
Current inflation immediately jumps down, then future inflation *rises*.

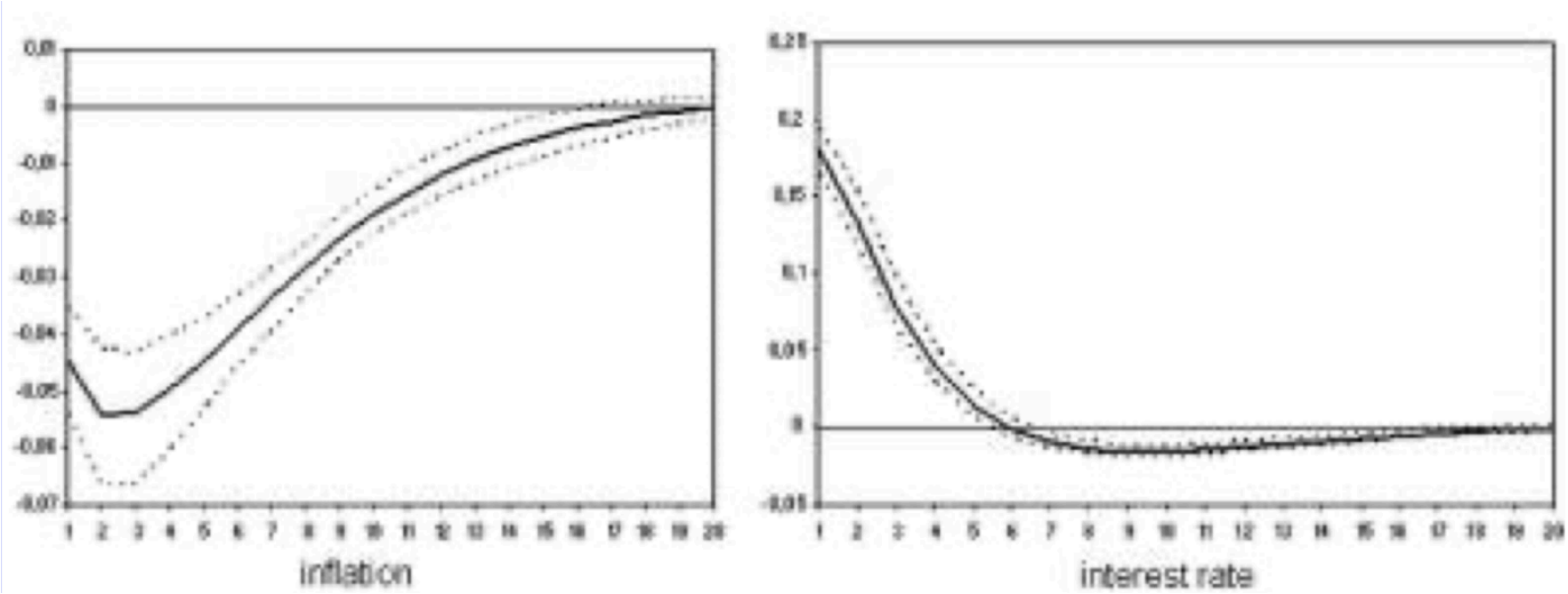
Key
$\pi_t = E_t\pi_{t+1} + \kappa x_t$
Lower x means lower π_t, *now, relative to future* $E_t\pi_{t+1}$. $E_t\pi_{t+1} > \pi_t$. "inflation declines" only from current downward jump.



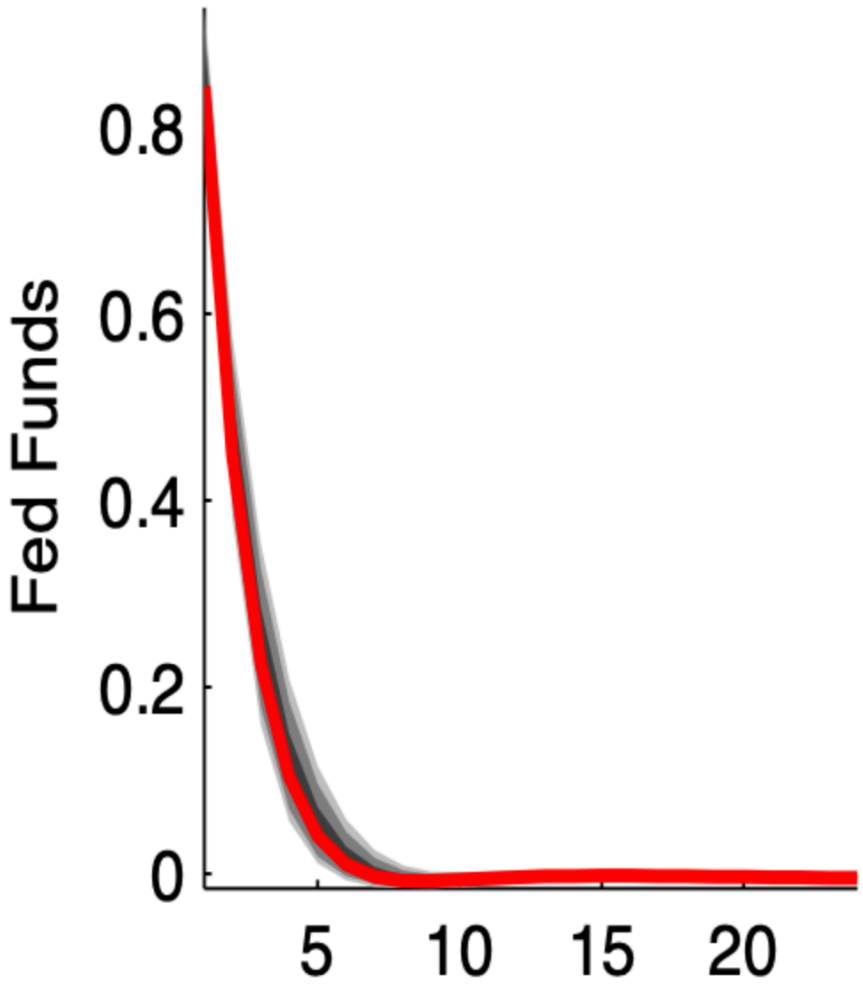
- Ball (1994) critique: high output with rising, not falling inflation.

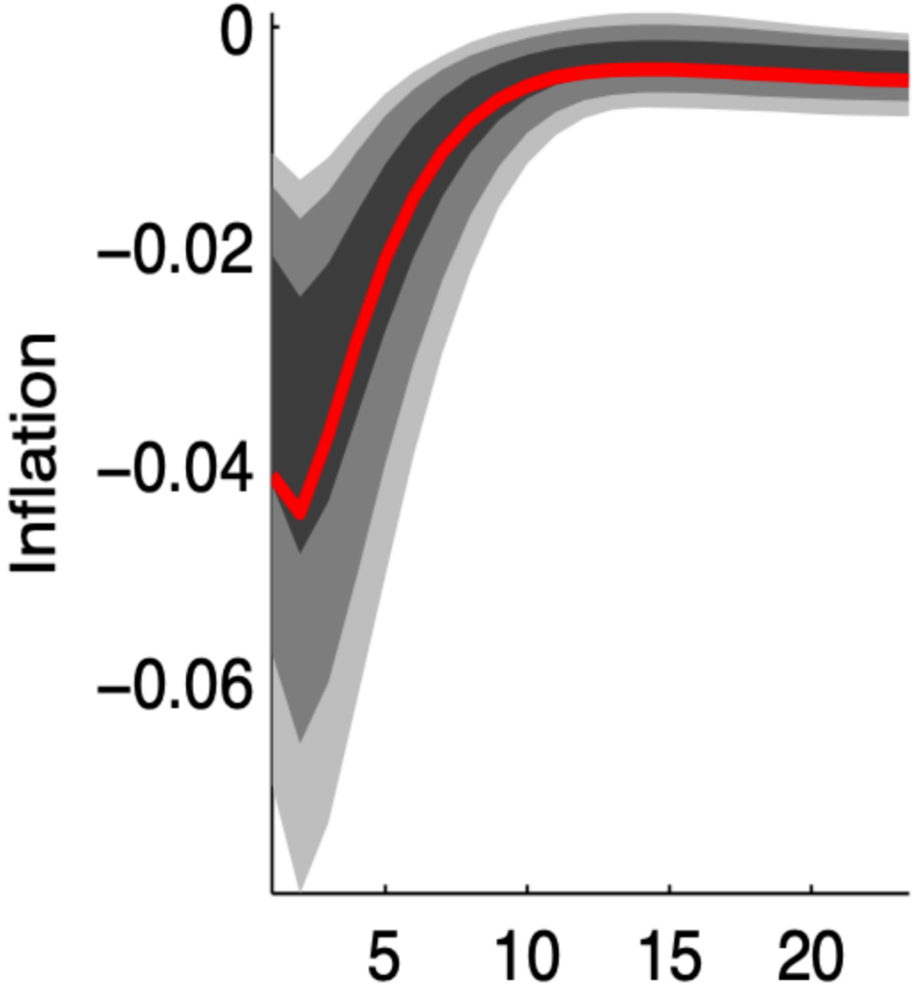
- Beliefs want sticky *inflation,* not sticky *prices*. Sticky prices do not mean sticky inflation! Inflation can jump with sticky prices.

Pervasive: Models say inflation jumps down then rises



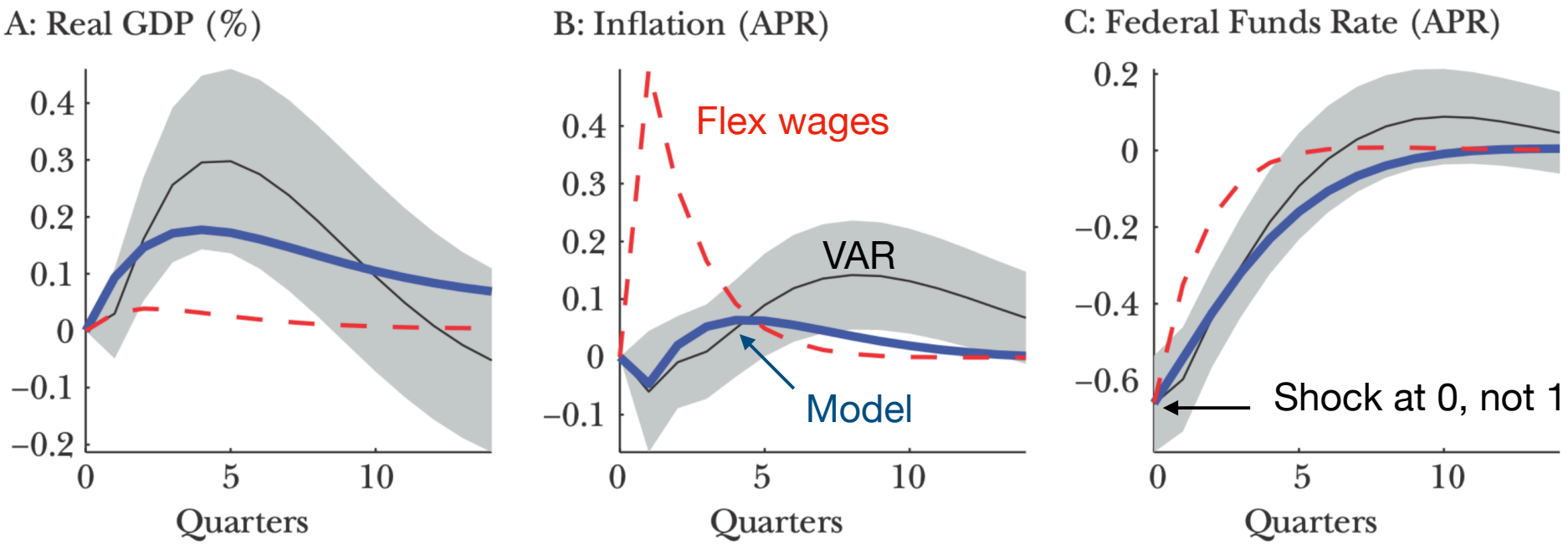
Smets and Wouters





Chung, Kiley, and Laforte FRBY

Success (sort of) Christiano, Eichenbaum, Evans



- Habits. $\log(c_t - bc_{t-1})$.
- Capital, adjustment costs $[1 - S(i_t/i_{t-1})]i_t$ not $S(i_t/k_t)i_t$.
- Calvo prices, wages; indexation.
- Prices, wages fixed for a quarter (VAR too).
- Variable costly capital utilization $k_t = u_t\bar{k}_t$.
- Firms borrow wage bill 1Q in advance.
- Money, money growth target.

- Growth rates in place of levels. Sticky π not p.

$$\pi_t \approx 0.5\pi_{t-1} + 0.5E_t\pi_{t+1} + \text{mc}_t;$$

$$\pi_t - \pi_{t-1} = E_t \sum_{j=0}^{\infty} \beta^j \text{mc}_{t+j}$$

- Inflation π_t not allowed to jump by assumption.
- Rewrites standard micro.
- i raises mc. Interesting. But *raises* inflation.
- mc uncorrelated with output/employment.
- All seem *necessary*! *Far* from standard intuition.

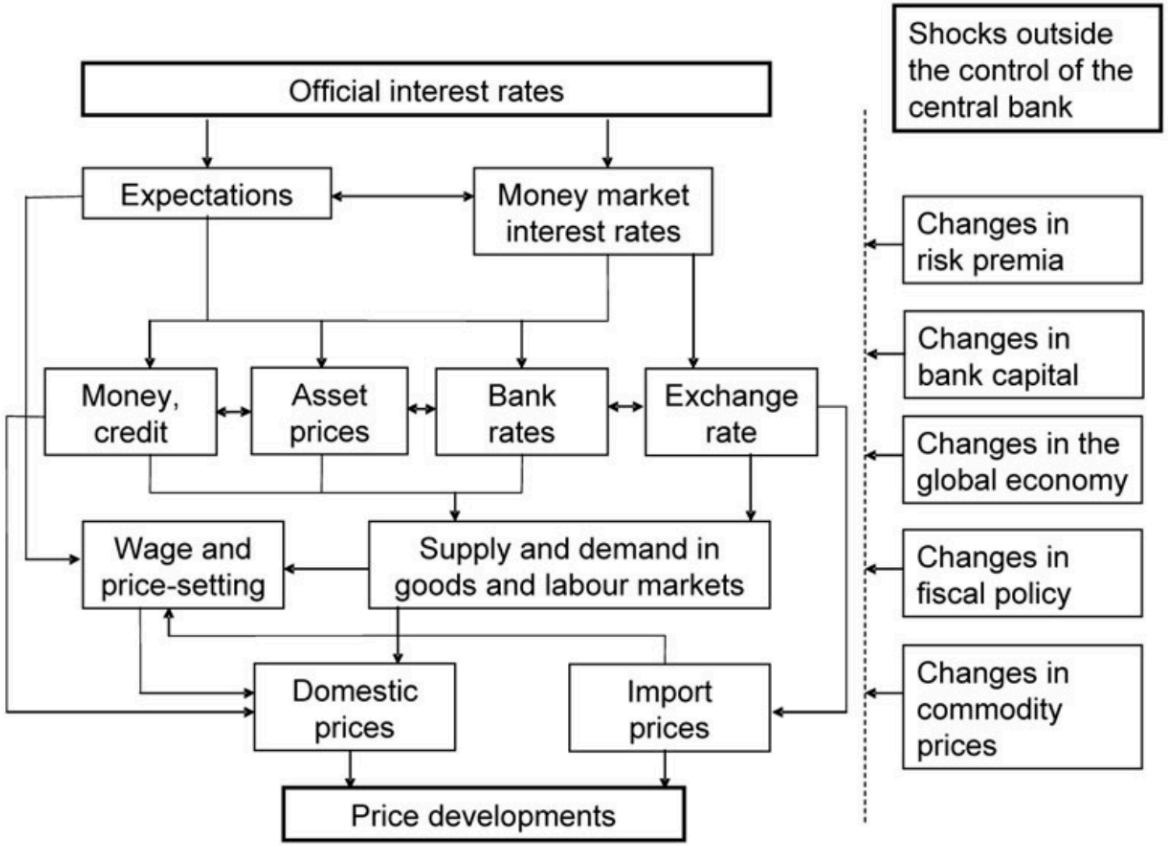
Do (and how) higher interest rates lower inflation? Quest for basic economic model

- Without fiscal help, higher rates don't lower inflation at all (except long term debt mechanism).
- Even with fiscal help, we do not have a simple economic model of standard Friedman 1968 / Fed "long and variable belief."
- Models that replicate VAR do not embody standard / Fed intuition.

  higher i $\rightarrow$ (sticky π^e) higher r $\rightarrow$ (lag) lower x,L, $\rightarrow$ (π_t can't move, lag) lower future π_{t+j}.
- Maybe models are right, inflation can jump, belief/VAR wrong.
- Central issue: The ever-troublesome Phillips curve. Sticky price or sticky inflation? Why can't dp/dt jump? Is i$\rightarrow$ lowers x, x $\rightarrow$ future inflation the central causal link of inflation dynamics?
- Amazing that after 40 years such basic questions are unanswered.

What we definitely do not know, courtesy ECB

The chart below provides a schematic illustration of the main transmission channels of monetary policy decisions.



Source: https://www.ecb.europa.eu/mopo/intro/transmission/html/index.en.html

TE TAI ŌHANGA
THE TREASURY

CBAx Community of Practice # 1

Improving CBA practice

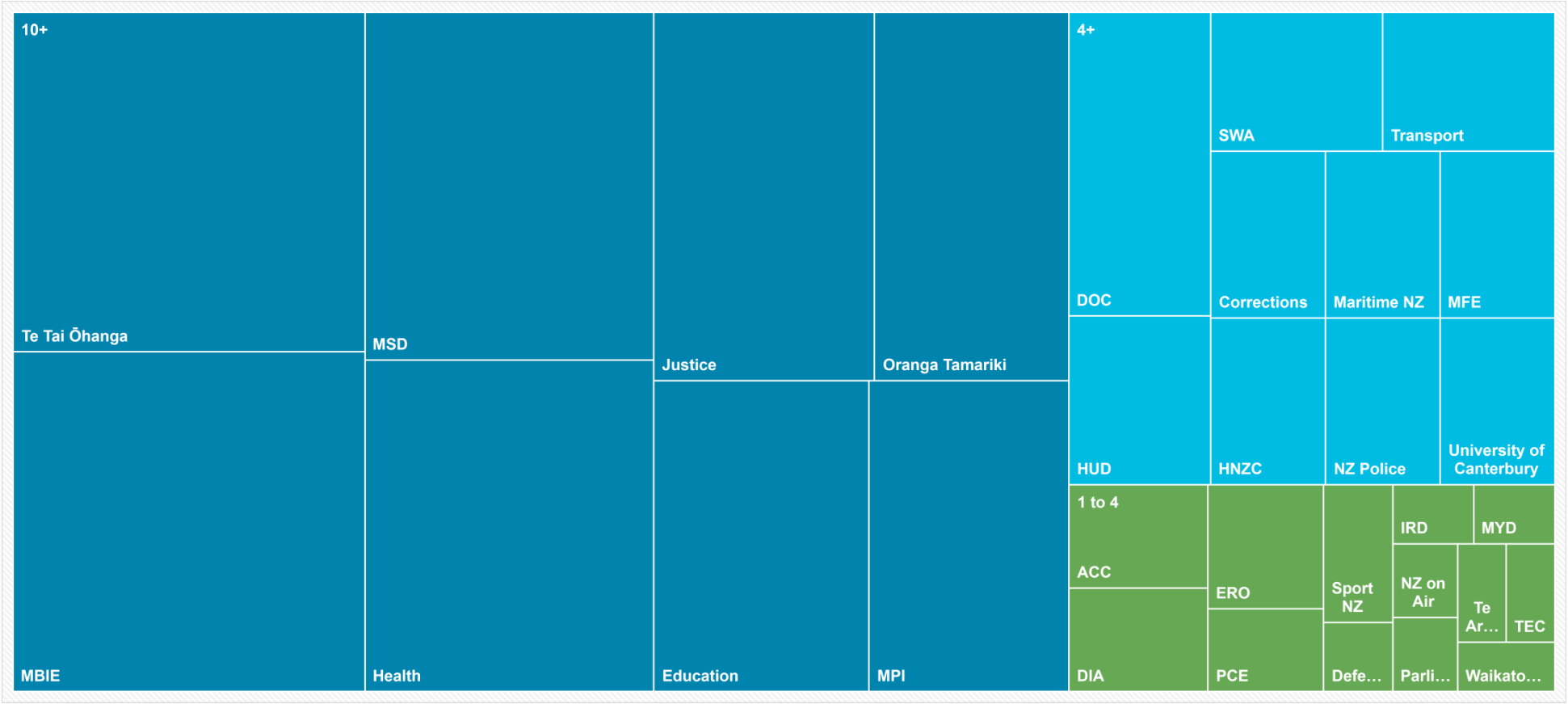
Amie White and Kirsten Jensen

2 October 2023

IN-CONFIDENCE

IN-CONFIDENCE

Community of Practice



Whāinga e te rōpū

The objectives of this group are to:

- **Empower** you to feel confident in providing well-considered, evidence-based advice
- Provide you with the tools and **support** to do a CBA using CBAx
- Create a space for **kōrero** on using the tool
- Answer your **questions** and to share **insights**

IN-CONFIDENCE

Rārangi take e te rōpū (online October to November on Monday 2 pm – 3 pm)

Lifting CBA practice 2023 series

Date	Agenda
Monday 2 October 2 – 3 pm	**Learn and develop** • CBAx update • Budget 2023 CBAs experiences • Intervention logic and a CBA (and other methods)
Monday 9 October 2 – 3 pm	**CBA and evaluation** • CBA – why, when and what (overview of the 7 steps) • How the summary outputs in CBAx can be used to evaluate • How other methods complement a CBA
Monday 16 October 2 – 3 pm	**Value for Money in Budget 2024** • Applying a Value, Alignment, Delivery rubric • How Treasury look at CBA outputs • Guest speakers: panel of reviewers of a CBA submission
Tuesday 24 October 2 – 3 pm	**Different aspects and approaches to CBA** Guest speakers - Looking at Living Standards Framework (Wellbeing), Living Standards Framework and He Ara Waiora (Te Ao Māori), Social Investment, Outcomes / Performance Reporting
Monday 30 October 2 – 3 pm	**Worked example of a basic CBA** Guest speaker - TBC
Monday 6 November 2 – 3 pm	**Sensitivity analysis and reverse analysis** When do we do it, why do we do it and how do we do it?

Date	Agenda
Monday 13 November 2 – 3 pm	**Deepish dive into the Impacts Database and how to incorporate non-monetised impacts.** - Utilising different impacts both in and outside the database
Monday 20 November 2 – 3 pm	Topic TBC – Climate change / transformational change using CBA and other methods.
Monday 27 November 2 – 3 pm	Topic TBC – Ex-post analysis and CBA Guest speakers – Wellbeing Researchers Panel

Future series - monthly from January 2024!

Email cbax@treasury.govt.nz with session topic suggestions.

Rārangi take i tēnei rā

Monday 2 October, 2 – 3 pm (Teams)

- Cost-benefit analysis (CBA), CBAx and intervention logic
- Budget 2023 CBA experiences
- CBAx update for Budget 2024

IN-CONFIDENCE

- CBA, CBAx and intervention logic
- Budget 2023 CBA experiences
- CBAx update for Budget 2024

IN-CONFIDENCE

What is Cost-Benefit Analysis (CBA)?

- A framework for systematically analysing the costs and benefits (i.e., the negative and positive societal impacts) of various options.
- An evaluation of the available options helping decision-makers to compare options using a common framework.
- Requires sound analysis with clear intervention logic, supported by evidence, and with assumptions clearly documented for a broad range of monetised and unmonetised wellbeing impacts.
- Can be used even if there is very little information or evidence available by preparing a reverse analysis. *We'll hold a hui on this topic later in the series!*
- http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/

What is CBAx?

CBAx is an Excel-based spreadsheet model to make it easier and faster to complete a CBA for policy decision-making. It helps to:

- Monetise and discount impacts of an initiative
- Take a long-term and broad view of costs and benefits
- Rigorously assess these by monetising impacts, where possible
- Be transparent about the assumptions and evidence base

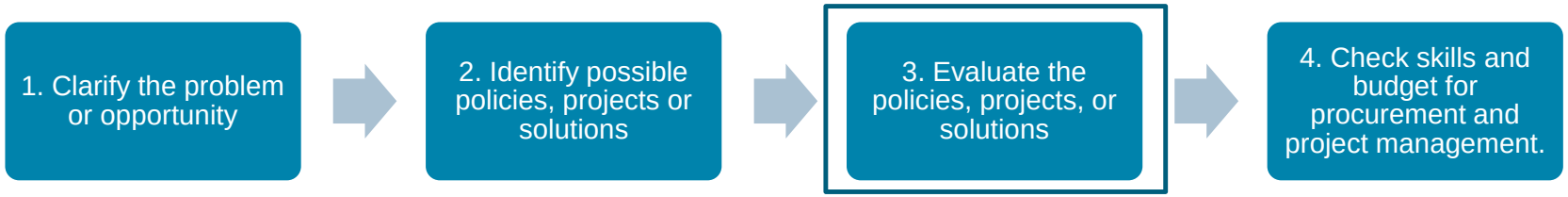
The CBAx tool:

- provides an impacts database to consistently value impacts
- links the impacts database throughout the model to easily perform a CBA
- produces information that can be used in CBA advice

IN-CONFIDENCE

The 7 steps of a CBA and inputs to CBAx

CBA is part of the **evaluation stage** of the policy development process. It is a method for assessing proposed options that have been developed to respond to a policy problem



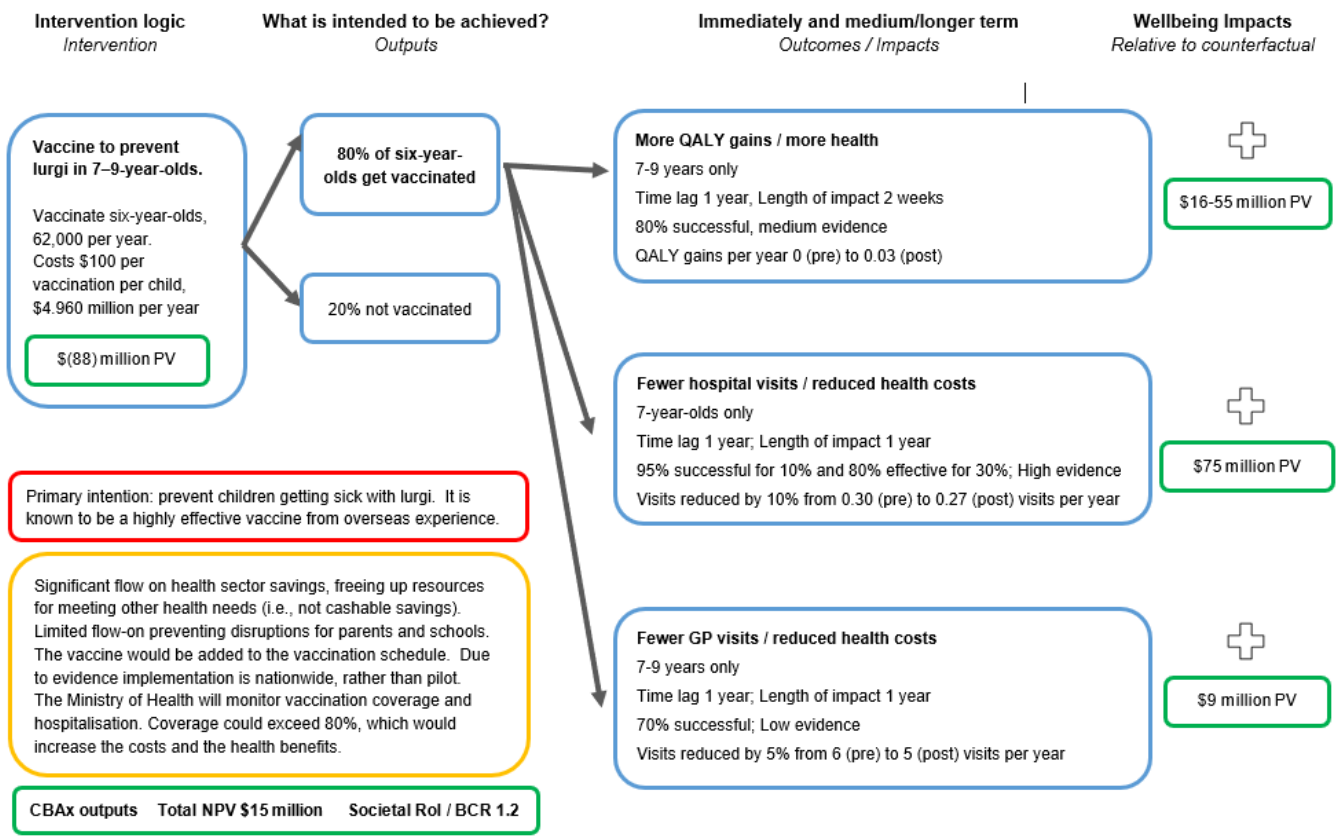
Using CBAx is a 7-step evaluative process as follows:

Policy evaluation *using CBA on each feasible option*	
Inputs to CBAx	**Step 1:** Define policy and counterfactual **Step 2:** Identify those who gain and those who lose **Step 3:** Identify the benefits and costs; allocate to time periods
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs
Outputs from CBAx	**Step 6:** Is the result clear enough? If not, consider whether it is worth investing in more research, repeat previous steps **Step 7:** Write report

IN-CONFIDENCE

Intervention logic – the early stages of a CBA

- Building your intervention logic map (ILM) feeds into the creation of your Primary Inputs into the CBAx tool.
- This early stage considers Steps 1 to 3 of the CBA (defining and identifying).



CBA using CBAx: the IQM approach

- **Identify wide –** identify impacts broadly (using wellbeing frameworks like the LSF)
- **Quantify where possible –** quantify impacts (the initial CBA steps and CBAx input assumptions).
- **Monetise selective** – monetise impacts where possible (using CBAx), focus on key impacts with good evidence.

Only monetise a subset of impacts

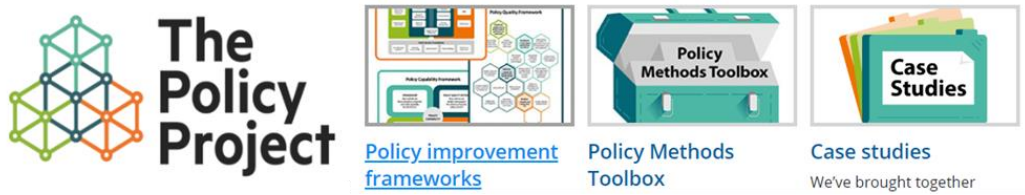
IN-CONFIDENCE

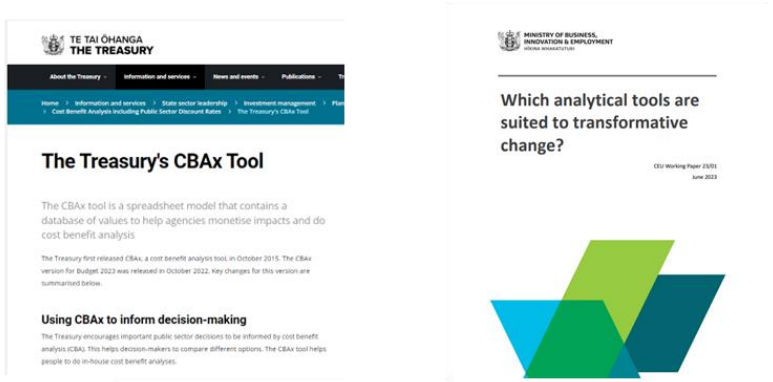
Combine CBA with other tools

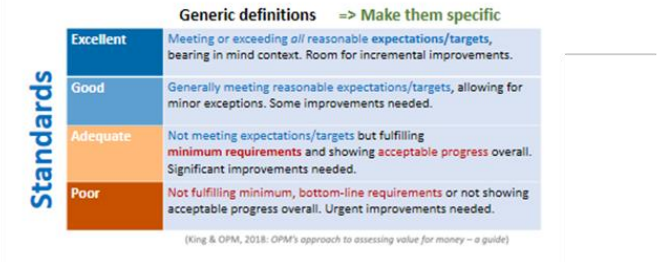
- Alternatives to CBA
  - MCA decision criteria in regulatory impacts
  - CEA – cost effectiveness analysis (one impact)
  - CUA – cost-utility analysis such as Health QALYs

- Qualitative and quantitative

We'll hold a hui that focuses more on this topic later in the series!







IN-CONFIDENCE

Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

IN-CONFIDENCE

- CBA, CBAx and intervention logic
- Budget 2023 CBA experiences
- CBAx update for Budget 2024

IN-CONFIDENCE

Budget 2023 - What did we see?

Few – this could change if requirements change

- Less than 10% of initiatives were supported by a submitted CBA/CBAx
- Consistent with other years, when CBAx is not a requirement
- Concentrated in a few agencies
- Likely more done to inform decision-making, but not submitted on CFISnet

Better - build your capability early

- Wide range of experience
- Reasonable returns – **more confidence** not overclaiming
- Stronger use of **sensitivity analysis** and supporting **assumptions**

IN-CONFIDENCE

What was your experience in Budget 2023?

Use the thumbs-up emoji reaction in the chat window to respond to each of these (we'll put the comment in for you to respond to):

- Did you **undertake or assess** any cost-benefit analysis for Budget 2023?
- Did you **use or assess outputs of** the CBAx tool for Budget 2023?
  (Even if you didn't submit it with an initiative)

IN-CONFIDENCE

What was your experience in Budget 2023?

- **What was your experience in Budget 2023?**
  - Help us, help you
  - What worked for you? What didn't work for you?

- **How could we increase CBAx submissions?**
  - Make CBAx a requirement? For which initiatives?
  - How could we improve the CBAx incentives / tool / guidance / support?
  - What bugs you?
  - What else?

IN-CONFIDENCE

Present and share your experiences

SOCIETY for BENEFIT-COST ANALYSIS

SBCA International Conference 2024

- George Washington University, Washington DC, US 18-19 March
- Virtually 4-5 April, at NZ friendly times

Call for abstracts – Due 31 October 2023

- Panel of NZ policy people discussing CBA experiences?
- Present CBA related agency work (15-20 minutes)

- Talk with Kirsten Jensen, Director on SBCA Board Kirsten.Jensen@treasury.govt.nz

IN-CONFIDENCE

Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

IN-CONFIDENCE

- CBA, CBAx and intervention logic
- Budget 2023 CBA experiences
- CBAx update for Budget 2024

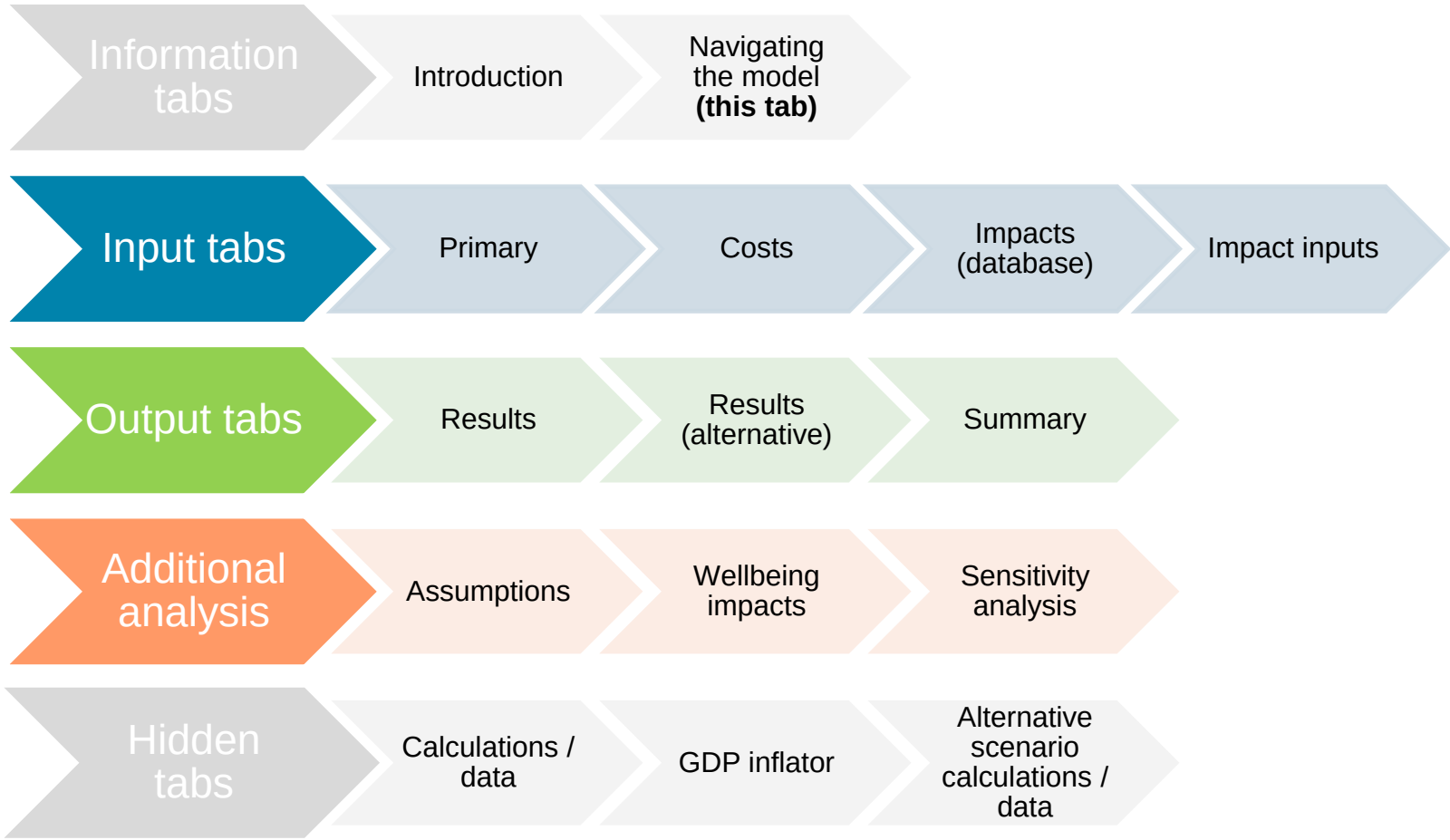
CBAx gets updated every year

Stable model for Budget 2024

- Updates to GDP and CPI
- Adjusting some values in the impacts database
- Value of a Statistical Life (VoSL) has increased significantly (do sensitivity analysis)
- Guidance is a 1/3 of the length – focused on Tool User guidance only.
- Supplementary information on key topics and FAQs available.
- New auto-populated and printable A3 summary tab
- Tab colours more consistent

IN-CONFIDENCE

Navigating CBAx



IN-CONFIDENCE

Other development in the pipelines.

Continued focus on improving usability and access

- Further development of user-friendly tool and guidance
- Discounting methodology
- Ex-post evaluation
- Others...

Message us if you want to be involved OR if you have impact values being developed or any that are ready: cbax@treasury.govt.nz

IN-CONFIDENCE

Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

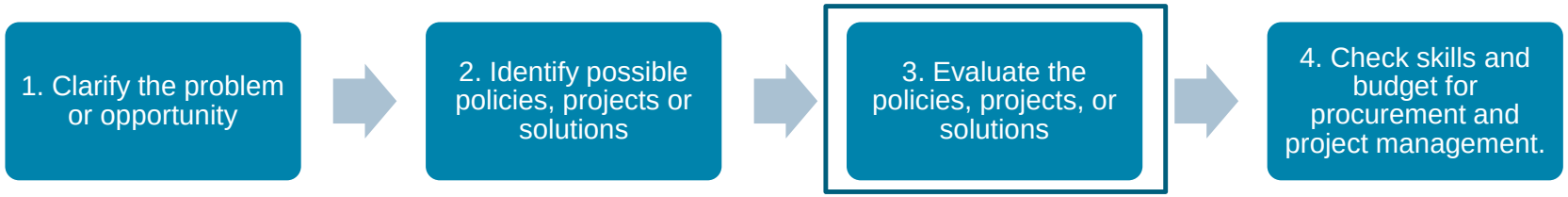
IN-CONFIDENCE

Key Takeaways

IN-CONFIDENCE

The 7 steps of a CBA and inputs to CBAx

CBA is part of the **evaluation stage** of the policy development process. It is a method for assessing proposed options that have been developed to respond to a policy problem



Using CBAx is a 7-step evaluative process as follows:

Policy evaluation *using CBA on each feasible option*	
Inputs to CBAx	**Step 1:** Define policy and counterfactual **Step 2:** Identify those who gain and those who lose **Step 3:** Identify the benefits and costs; allocate to time periods
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs
Outputs from CBAx	**Step 6:** Is the result clear enough? If not, consider whether it is worth investing in more research, repeat previous steps **Step 7:** Write report

CBA using CBAx: the IQM approach

- **Identify wide –** identify impacts broadly (using wellbeing frameworks like the LSF)
- **Quantify where possible –** quantify impacts (the initial CBA steps and CBAx input assumptions).
- **Monetise selective** – monetise impacts where possible (using CBAx), focus on key impacts with good evidence.

Only monetise a subset of impacts

IN-CONFIDENCE

We are here to help...

Get in touch via the CBAx email address here at Treasury:

cbax@treasury.govt.nz

The email **is** monitored and also comes to both Kirsten and me.

IN-CONFIDENCE

Pātai / Questions?

Hei tērā Rāhina!

TE TAI ŌHANGA
THE TREASURY

CBAx Community of Practice # 2

Improving CBA practice

Amie White and Kirsten Jensen

9 October 2023

IN-CONFIDENCE

Whāinga e te rōpū

- **Empower** you to feel confident in providing well-considered, evidence-based advice
- Provide you with the tools and **support** to do a CBA using CBAx
- Create a space for **kōrero** on using the tool
- Answer your questions and to **share** insights

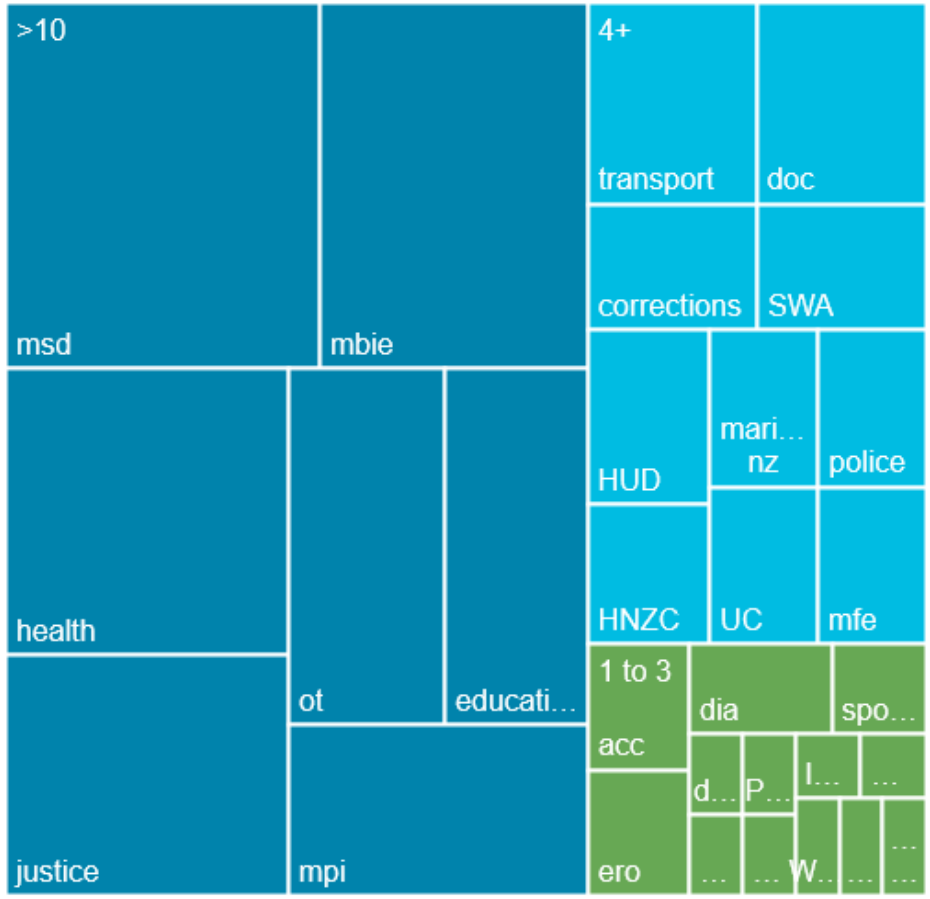
IN-CONFIDENCE

Contacting others in your agency

We're keen to connect you with others in your agency. Are you okay with us sharing your details on request?

Use the thumbs-up emoji reaction in the chat window to respond (or thumbs-down if not)

Please email us on CBAx@treasury.govt.nz if you do not want us to share your contact details on request with others in the CBAx Community of Practice.



IN-CONFIDENCE

Rōpū rārangi take (online October to November on Monday 2 pm – 3 pm)

Lifting CBA practice 2023 series

Date	Agenda
Slides available online: Session #1	**Learn and develop** • CBAx update for Budget 2024 • Budget 2023 CBAs experiences • Intervention logic and a CBA (and other methods)
Mon 9 Oct 2 – 3 pm	**CBA and evaluation** • CBA – why, when and what (overview of the 7 steps) • Evaluating CBAx summary outputs • How other methods complement a CBA
Wed 18 Oct 2 – 3 pm	**Value for Money in Budget 2024** • Applying a value for money lens • Panel – insights into how Treasury looks at CBA submissions
Tue 24 Oct 2 – 3 pm	**Different aspects and approaches to CBA** Panel - Living Standards Framework (Wellbeing), He Ara Waiora (Te Ao Māori), Social Investment, Outcomes / Performance Reporting
Mon 30 Oct 2 – 3 pm	**Worked example of a basic CBA** Guest speaker - TBC
Mon 6 Nov 2 – 3 pm	**Cost pressures, reverse analysis and sensitivity analysis** When do we do it, why do we do it and how do we do it?

Date	Agenda
Mon 13 Nov 2 – 3 pm	**Dive into the Impacts Database and how to include non-monetised impacts and add new impacts**
Mon 20 Nov 2 – 3 pm	Topic TBC – Climate change / transformational change using CBA and other methods.
Mon 27 Nov 2 – 3 pm	Topic TBC – Ex-post analysis and CBA Guest speakers – Wellbeing Researchers Panel

Future series – monthly from January 2024!

Email cbax@treasury.govt.nz with session topic suggestions.

IN-CONFIDENCE

- What is CBA, when to do it, and why to do it?
- How to evaluate CBAx outputs
- How other methods complement a CBA

What is Cost-Benefit Analysis (CBA) and CBAx?

- A framework for systematically analysing the costs and benefits (i.e., the negative and positive societal impacts) of various policy options.
- CBAx is an Excel-based spreadsheet model to make it easier and faster to complete a CBA for policy decision-making. It helps to monetise and discount impacts of an initiative and to be transparent about the assumptions and evidence base.
- **CBA and CBAx requires information and judgements on assumptions.** You will need to make judgements, based on the best available evidence, and what is a reasonable analysis for the proposal.
- The purpose of CBAx is not to deliver a judgement on what the assumptions should be. Instead, it is more about making these assumptions transparent, so that discussions and advice about wellbeing impacts can be better informed, and so that we can learn from our analysis in the future.

Why do CBA and when?

- CBAx should be used specifically to strengthen value for money and wellbeing analysis with CBA.
- When you're seeking to understand the monetised impacts in a CBA to support public sector policy decision-making.
- If there is very little information or evidence available, an option is to use CBAx to prepare a reverse analysis.

If you monetise impacts use CBAX to

- Identify wellbeing impacts in the LSF (and other frameworks e.g. He Ara Waiora)
- quantify the wellbeing impacts using clear assumptions and evidence base
- value key impacts on a comparable basis

IN-CONFIDENCE

Standard CBA or Reverse Analysis?

The following table summarises the difference between the Standard and Reverse Analysis.

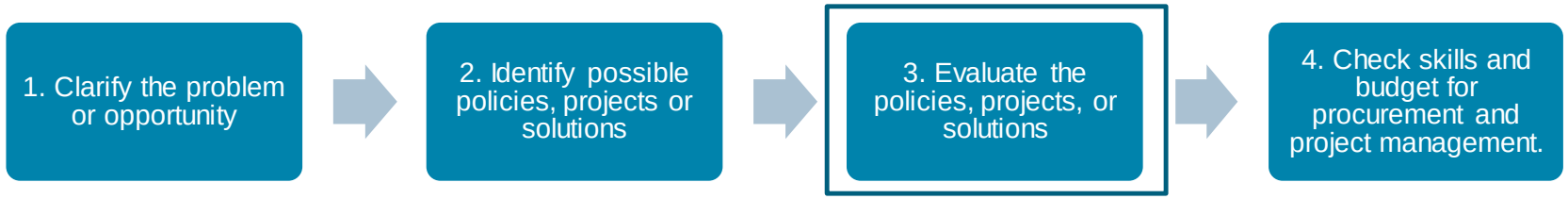
Type of analysis	Answers the question...	Results	Assess whether worthwhile
Standard CBA - *The best option*	What is the magnitude of the societal benefits relative to costs?	Estimates the expected total net benefits	Is the ROI > 1 and better than alternative options?
Reverse Analysis – *An option if evidence is weak*	What would it take for the proposal to break-even i.e., ROI = 1?	Identifies the minimum assumptions for benefits to match costs	Are the minimum assumptions likely to be reasonable and achieved?

A reverse analysis means approaching the CBA from the viewpoint of 'what would it take to make the proposal be worthwhile?' or generate a return on investment of 1 with societal benefits outweighing costs. Even if the evidence base is weak, e.g., in the case of pilot programmes, being transparent about these assumptions provides a basis for developing an evaluation plan.

IN-CONFIDENCE

The 7 steps of a CBA and inputs to CBAx

CBA is part of the **evaluation stage** of the policy development process. It is a method for assessing proposed options that have been developed to respond to a policy problem



Using CBAx is a 7-step evaluative process as follows:

Policy evaluation *using CBA on each feasible option*	
Inputs to CBAx	**Step 1:** Define policy and counterfactual **Step 2:** Identify those who gain and those who lose **Step 3:** Identify the benefits and costs; allocate to time periods
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs
Outputs from CBAx	**Step 6:** Is the result clear enough? If not, consider whether it is worth investing in more research, repeat previous steps **Step 7:** Write report

IN-CONFIDENCE

How does CBAx analysis fit into a budget initiative?

The Budget Guidance, issued via CFISnet each year, sets out the requirements of CBA and CBAx for Budget initiatives. Incorporate your findings into your Budget Initiative template. Treasury's focus isn't primarily on the CBA results, but on the underlying assumptions and evidence.

Policy evaluation *using CBA on each feasible option*		*Budget initiative template*
Inputs to CBAx	**Step 1:** Define policy and counterfactual	Section on the investment proposal, including problem definition and options analysis
	Step 2: Identify those who gain and those who lose	Section on the wellbeing impacts and analysis including the intervention logic map and distributional analysis
	Step 3: Identify the benefits and costs; allocate to time periods	
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs	Section on the wellbeing impacts

For specific advice contact your finance or budget teams within your agency, or the relevant vote team within the Treasury.

Who should be involved?

- Initiative lead (policy/budget)
- Draw on specialist teams within your agency e.g., research and analysis teams likely to help in the evidence gathering stage or costing and/or modelling teams with excel experience to help with navigating the CBAx tool.
- Involve different perspectives e.g. subject matter experts, policy, finance, actuaries, service delivery and evaluation.
- Involve other agencies with shared outcomes or intervention group.
- Your Treasury vote team - especially if you're unsure about the process or want to test assumptions.
- The CBAx team on CBAx@treasury.govt.nz to answer questions, provide advice on how to approach CBAx modelling for a given proposal, and review draft CBAxs.

Contact them early on.

IN-CONFIDENCE

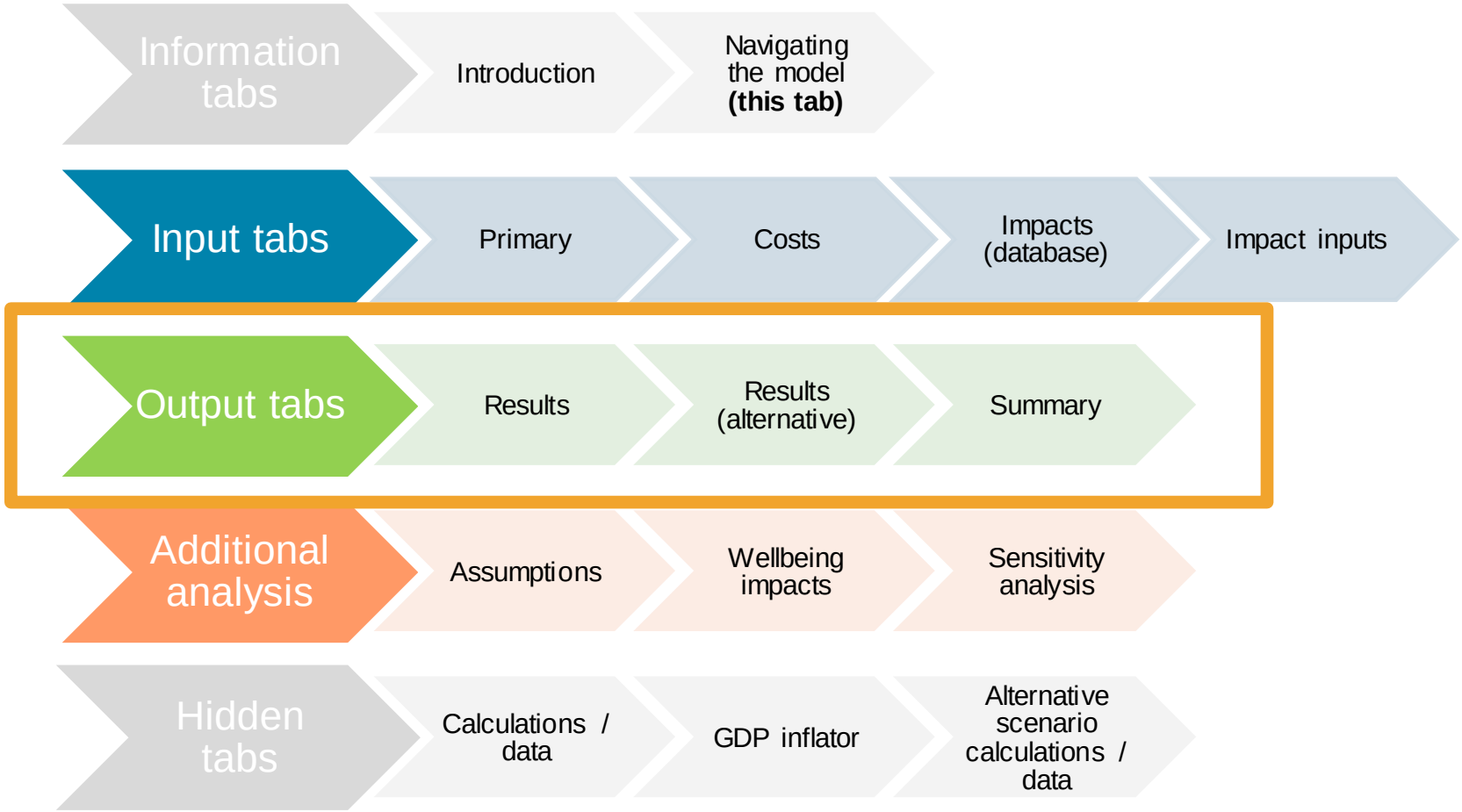
Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

IN-CONFIDENCE

- What is CBA, when to do it, and why to do it?
- How to evaluate CBAx outputs
- How other methods complement a CBA

Navigating CBAx



IN-CONFIDENCE

How do I interpret this?!

Output Summary for: Lurgi Vaccine

Proposal details

Analysis type	Standard CBA		
Initiative title	Lurgi Vaccine		
Initiative details	Vaccine for children affected by Lurgi		
Start year	2024	Total population over 50 Years	3,038,000
Period for analysis	50 years	Discount rate	5%
Non-monetised impacts	Low (+)		

Agency Value for Money Assessment

Value	1 - Low Value / Returns
Strategic alignment	4 - High Alignment
Deliverability	3 - Moderate Likelihood of Delivery

Summary metrics (for full period of analysis)

Return on Investment, Societal Total (50y)	1.4
Return on Investment (high evidence quality only), Societal Total (50y)	0.9
Return on Investment, Government only (50y)	1.0
Return on Investment (high evidence quality only), Government only (5	0.9
Benefit cost ratio, Societal Total (50y)	1.4
Benefit cost ratio (high evidence quality only), Societal Total (50y)	0.9

Net economic benefit per cohort member

50 years	$ 11
High evidence quality only (50 years)	-$ 3
NPV costs per cohort member (50 years)	$ 29

Return on Investment Summary 50 years

	Discount rate 5% real discount rate	2% real discount rate	Evidence certainty
Initiative costs present value i.e. Government investment $m	(88)	(153)	High
Government impacts $m	84	148	Medium
Wider societal impacts $m	39	69	Medium
Total societal impacts, net present value $m	34	65	Medium
Non-monetised impacts	Low (+)	Low (+)	Low
Benefit cost ratio, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Government only (50y)	1.0	1.0	High

Net benefit summary

Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	202
Total marginal impact	18	43	122	-	-
Total cost of initiative	(17)	(34)	(88)	-	(5
Net economic benefits	1	9	34	-	(5

Summary of initiative fiscal cost

Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	2025
Operating expenses	(17)	(34)	(88)	-	(5)
Capital expenses	-	-	-	-	-
Total fiscal cost of initiative	(17)	(34)	(88)	-	(5)

Summary of Initiative

• This proposal (Lurgi Vaccine) performs a Standard CBA for the period of 50 years with a discount rate o
initiative is about Vaccine for children affected by Lurgi. The target population for this intervention is descr
year olds receiving vaccine to prevent Lurgi disease in 7-9 year olds , measured by Individuals. The fiscal
initiative / funding being sought is estimated as $88m.
• The Societal return on investment (ROI) is 1.4 with Medium evidence certainty. The Government only R
High evidence certainty.
• The proposal has been self assessed as 1 - Low Value / Returns for overall value for money, with an
of 4 - High Alignment and a deliverability rating of 3 - Moderate Likelihood of Delivery. The proposal's n
impacts are Low (+). The net economic benefit yields $34m for the 50 years of the intervention.
• The top wellbeing impacts (monetised and non-monetised) are Prevented hospitalisations over the
years), Health gains - Quality-adjusted life years (QALYs) over the Short term (<5 years) and Prevent
the Short term (<5 years).

Present-day value charts

Present Day Value of Impact(s) by Wellbeing Domains

Net Present Value Over Time at 5% discount rate

Cumulative Present Value (by Discount Rate)

Assumptions made and key notes *Explain key modelling assumptions or anything important individuals looking at the model should know.*

It is an ongoing vaccination programme. 62,000 six-year olds per year are expected - flat profile across years. The costs are $100 per vaccinated child. 80% vaccination rate is expected.

Mild cases of the illness have a reduction in average utility of 0.03 for the period of the illness, ie if a child is otherwise in perfect health and they have the illness for one week, they lose QALYs = (0.03 * 1/52). Severe cases of the illness (perhaps identified as those needing hospitalisation) have an average reductio
in utility of 0.35 for the duration of the illness.

Modelling assumes mild cases with QALY gains for two weeks. Returns would increase if severe cases were included. Sensitivity analysis for different QALY valuations.

An 80% vaccination rate is expected for six-year olds as the central scenario. The vaccine is particularly effective (95%) at preventing hospitalisation for the 10% most vulnerable. It is also very effective (80%) at preventing hospitalisation in a further 30% of cases. For the remaining 40% vaccinated, the vaccine prevents GP visits (70% effective). Secondary benefits to for example parents and schools are un-monetised. These are expected to be moderate.

Proposal details

Proposal details				Agency Value for Money Assessment	
Analysis type	Standard CBA			Strategic alignment	3 - Moderate Alignment
Initiative title	Lurgi Vaccine				
Initiative details	Vaccine for children affected by Lurgi			Benefits and costs	2 - Partial Value / Returns
Start year	2024	Total population over 50 Years	3,038,000	Deliverability	4 - Excellent Likelihood of Delivery
Period for analysis	50 years	Discount rate	5%		
Non-monetised impacts	Low (+)				

- Most auto-generated from your primary inputs
- Select your analysis type: Standard CBA / Reverse analysis
- Rate your non-monetised impacts: high positive to high negative impacts
- Assess your initiative for Value for Money (aligns with the budget initiative template and support general evidence on value for money). This is your assessment of the alignment, benefits – costs, and deliverability of your initiative – this assessment does not impact the calculations.

Next week's hui will delve into the value for money considerations further.

IN-CONFIDENCE

The Return on Investment (ROI)

The ROI shows the **impact per dollar that the government spends on an initiative**. In this example, for every $1.00 dollar that the government spends**, New Zealanders receive about $1.40 worth of benefits. Shown as a 1 : 1.4 ratio.**

The summary shows two ROIs – a societal total and a government-only. The societal ROI considers **all the impacts**, the government-only considers **government-specific impacts**.

We use the ROI because when you prepare a proposal for funding, Ministers often want to know:

'What we get (Net Impacts) **for the amount spent** (Fiscal Cost)**'.**

The ROI shows the **Net impacts** divided by the **Fiscal costs**.

Summary metrics (for full period of analysis)	
Return on Investment, Societal Total (50y)	1.4
Return on Investment (high evidence quality only), Societal Total (50y)	0.9
Return on Investment, Government only (50y)	1.0
Return on Investment (high evidence quality only), Government only (50y	0.9
Benefit cost ratio, Societal Total (50y)	1.4
Benefit cost ratio (high evidence quality only), Societal Total (50y)	0.9

Return on Investment

$$\frac{\text{net impacts } (+'ve\ impacts\ -\ -'ve\ impacts)}{\text{fiscal costs}}$$

IN-CONFIDENCE

Rules of Thumb for ROI

ROI > 5 it is almost certain that the impacts are over estimated, and some assumptions are too optimistic.

ROI ~2 - 5 it is highly likely that some impacts are overestimated or that tenuous impacts have been included.

ROI ~1 – 2 the assumptions are likely to be more robust.

Common problems that can lead to overestimated impacts are:

The **length of impact is too long** / double counts the impacted person / group. General guide: max 2 years length of impact for each person / group.

Including **groups more than once** – check the primary input profile.

Over **optimistic assumptions** about success rate or magnitude of impact relative to the counter factual.

IN-CONFIDENCE

The Benefit to Cost Ratio (BCR)

The other key figure to consider is the Benefit to Cost Ratio (BCR).

This differs to the ROI because it considers negative impacts as a 'cost', so negative impacts sit alongside fiscal costs.

The key difference between the ROI and BCR calculations is the **location of the Negative Impacts** value.

The ROI = BCR if there are no negative impacts. In many cases, negative impacts are not included in CBAx submissions.

Summary metrics (for full period of analysis)	
Return on Investment, Societal Total (50y)	1.4
Return on Investment (high evidence quality only), Societal Total (50y)	0.9
Return on Investment, Government only (50y)	1.0
Return on Investment (high evidence quality only), Government only (50y	0.9
Benefit cost ratio, Societal Total (50y)	1.4
Benefit cost ratio (high evidence quality only), Societal Total (50y)	0.9

Return on Investment

$$\frac{\text{net impacts } (+'ve\ impacts\ -\ -'ve\ impacts)}{\text{fiscal costs}}$$

Benefit to Cost Ratio

$$\frac{\text{positive impacts}}{\text{fiscal costs} + \text{negative impacts}}$$

IN-CONFIDENCE

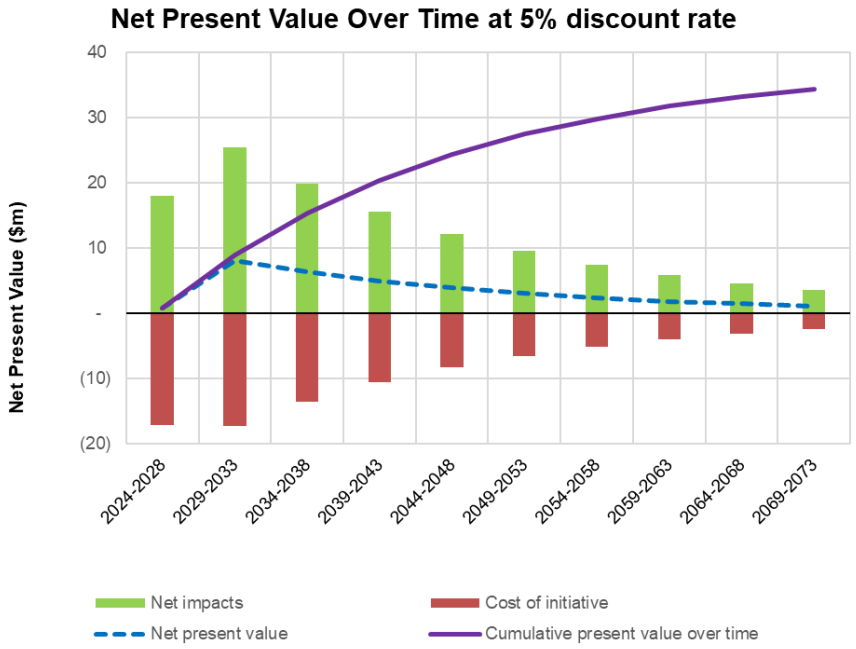
Considering the evidence base

Return on Investment Summary 50 years	Discount rate		Evidence certainty
	5% real discount rate	2% real discount rate	
Initiative costs present value i.e. Government investment $m	(88)	(153)	High
Government impacts $m	84	148	Medium
Wider societal impacts $m	39	69	Medium
Total societal impacts, net present value $m	34	65	Medium
Non-monetised impacts	Low (+)	Low (+)	Low
Benefit cost ratio, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Government only (50y)	1.0	1.0	High

Provides you with a view of the costs (and related evidence certainty) and the consideration of the non-monetised impacts.

IN-CONFIDENCE

Visualising the outputs



This chart shows the profile of the impacts (net positive and negative), the cost of the initiative, the net present value and the cumulative net present value.

The dashed line shows the **Net Present Value** per year / value of an initiative over time, in today's dollars. It is the sum of the green **impact** and red **cost** bars.

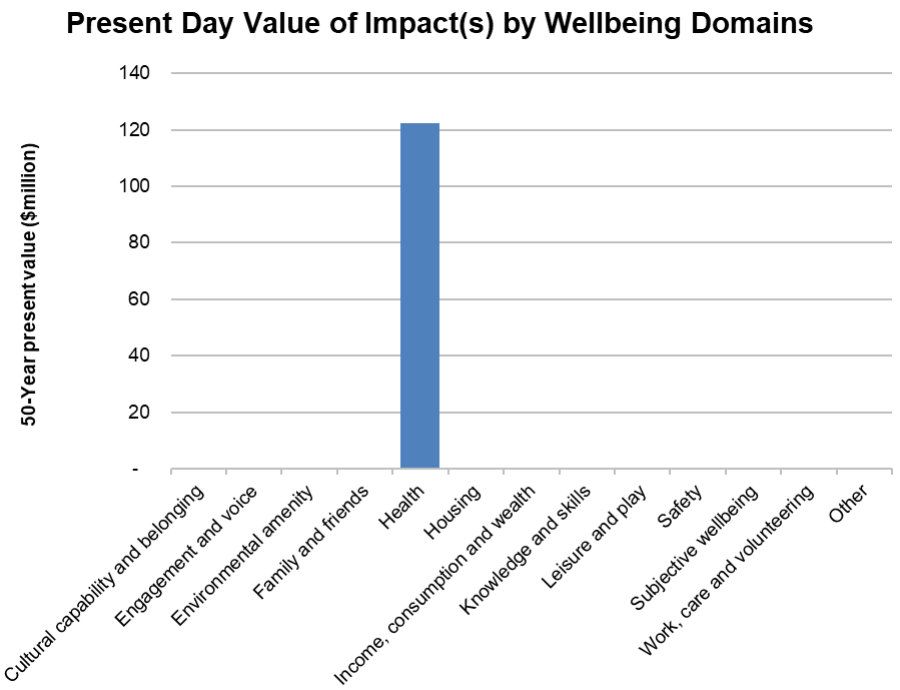
In the first five years, the **net impacts** are $17 million, and the **cost of the initiative** is also $17 million. So, the net present value for that period is $0.

From 2029 onwards, the net benefits (green bar) outweigh the costs (red bar), so the dashed line shows a positive Net Present Value until 2073.

The solid line shows the **Cumulative Present Value over time.**

IN-CONFIDENCE

Visualising the outputs #2



This chart shows the total value of an initiative for the period of the initiative in today's dollars by wellbeing domain. This examples impacts are all in Health.

IN-CONFIDENCE

Document a quick summary of your assumptions

Output Summary for: Lurgi Vaccine

Proposal details

Analysis type	Standard CBA		
Initiative title	Lurgi Vaccine		
Initiative details	Vaccine for children affected by Lurgi		
Start year	2024	Total population over 50 Years	3,038,000
Period for analysis	50 years	Discount rate	5%
Non-monetised impacts	Low (+)		

Agency Value for Money Assessment

Value	1 - Low Value / Returns
Strategic alignment	4 - High Alignment
Deliverability	3 - Moderate Likelihood of Delivery

Summary metrics (for full period of analysis)

Return on Investment, Societal Total (50y)	1.4
Return on Investment (high evidence quality only), Societal Total (50y)	0.9
Return on Investment, Government only (50y)	1.0
Return on Investment (high evidence quality only), Government only (5	0.9
Benefit cost ratio, Societal Total (50y)	1.4
Benefit cost ratio (high evidence quality only), Societal Total (50y)	0.9

Net economic benefit per cohort member	
50 years	$ 11
High evidence quality only (50 years)	-$ 3
NPV costs per cohort member (50 years)	$ 29

Return on Investment Summary 50 years

	Discount rate		Evidence certainty
	5% real discount rate	2% real discount rate	
Initiative costs present value i.e. Government investment $m	(88)	(153)	High
Government impacts $m	84	148	Medium
Wider societal impacts $m	39	69	Medium
Total societal impacts, net present value $m	34	65	Medium
Non-monetised impacts	Low (+)	Low (+)	Low
Benefit cost ratio, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Government only (50y)	1.0	1.0	High

Net benefit summary

Unit: 2024 ($m)

Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	2025	2026	2027	2028
Total marginal impact	18	43	122	-	-	7	7	7
Total cost of initiative	(17)	(34)	(88)	-	(5)	(5)	(5)	(5)
Net economic benefits	1	9	34	-	(5)	2	2	2

Summary of initiative fiscal cost

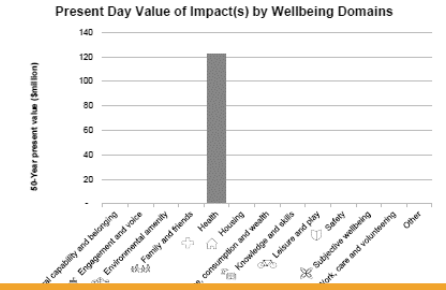
Unit: 2024 ($m)

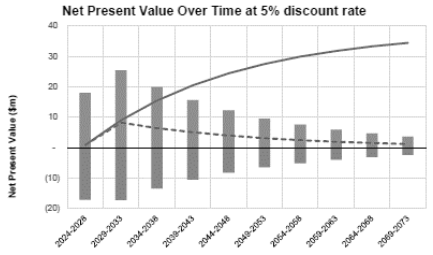
Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	2025	2026	2027	2028
Operating expenses	(17)	(34)	(88)	-	(5)	(5)	(5)	(5)
Capital expenses	-	-	-	-	-	-	-	-
Total fiscal cost of initiative	(17)	(34)	(88)	-	(5)	(5)	(5)	(5)

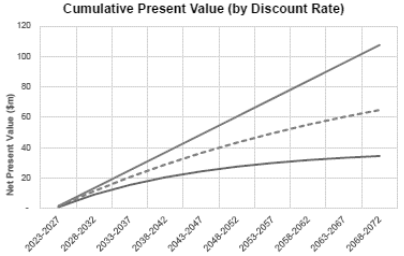
Summary of Initiative

- This proposal (Lurgi Vaccine) performs a Standard CBA for the period of 50 years with a discount rate of 5%. The initiative is about Vaccine for children affected by Lurgi. The target population for this intervention is described as Six year olds receiving vaccine to prevent Lurgi disease in 7-9 year olds , measured by Individuals. The fiscal cost of the initiative / funding being sought is estimated as $88m.
- The Societal return on investment (ROI) is 1.4 with Medium evidence certainty. The Government only ROI is 1. with High evidence certainty.
- The proposal has been self assessed as 1 - Low Value / Returns for overall value for money, with an alignment rating of 4 - High Alignment and a deliverability rating of 3 - Moderate Likelihood of Delivery. The proposal's non-monetised impacts are Low (+). The net economic benefit yields $34m for the 50 years of the intervention.
- The top wellbeing impacts (monetised and non-monetised) are Prevented hospitalisations over the Short term (<5 years), Health gains - Quality-adjusted life years (QALYs) over the Short term (<5 years) and Prevented GP visits over the Short term (<5 years).

Present-day value charts







Net present value — Cumulative present value over time

Assumptions made and key notes *Explain key modelling assumptions or anything important individuals looking at the model should know.*

It is an ongoing vaccination programme. 62,000 six-year olds per year are expected - flat profile across years. The costs are $100 per vaccinated child. 80% vaccination rate is expected.

Mild cases of the illness have a reduction in average utility of 0.03 for the period of the illness, ie if a child is otherwise in perfect health and they have the illness for one week, they lose QALYs = (0.03 * 1/52). Severe cases of the illness (perhaps identified as those needing hospitalisation) have an average reduction in utility of 0.35 for the duration of the illness.

Modelling assumes mild cases with QALY gains for two weeks. Returns would increase if severe cases were included. Sensitivity analysis for different QALY valuations.

An 80% vaccination rate is expected for six-year olds as the central scenario. The vaccine is particularly effective (95%) at preventing hospitalisation for the 10% most vulnerable. It is also very effective (80%) at preventing hospitalisation in a further 30% of cases. For the remaining 40% vaccinated, the vaccine prevents GP visits (70% effective). Secondary benefits to for example parents and schools are un-monetised. These are expected to be moderate.

IN-CONFIDENCE

Auto-generated commentary to use in your analysis

Output Summary for: Lurgi Vaccine

Proposal details

Analysis type	Standard CBA		
Initiative title	Lurgi Vaccine		
Initiative details	Vaccine for children affected by Lurgi		
Start year	2024	Total population over 50 Years	3,038,000
Period for analysis	50 years	Discount rate	5%
Non-monetised impacts	Low (+)		

Agency Value for Money Assessment

Value	1 - Low Value / Returns
Strategic alignment	4 - High Alignment
Deliverability	3 - Moderate Likelihood of Delivery

Summary metrics (for full period of analysis)

Return on Investment, Societal Total (50y)	1.4
Return on Investment (high evidence quality only), Societal Total (50y)	0.9
Return on Investment, Government only (50y)	1.0
Return on Investment (high evidence quality only), Government only (5	0.9
Benefit cost ratio, Societal Total (50y)	1.4
Benefit cost ratio (high evidence quality only), Societal Total (50y)	0.9

Net economic benefit per cohort member

50 years	$ 11
High evidence quality only (50 years)	-$ 3
NPV costs per cohort member (50 years)	$ 29

Return on Investment Summary 50 years

	Discount rate		Evidence certainty
	5% real discount rate	2% real discount rate	
Initiative costs present value i.e. Government investment $m	(88)	(153)	High
Government impacts $m	84	148	Medium
Wider societal impacts $m	39	69	Medium
Total societal impacts, net present value $m	34	65	Medium
Non-monetised impacts	Low (+)	Low (+)	Low
Benefit cost ratio, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Societal Total (50y)	1.4	1.4	Medium
Return on Investment, Government only (50y)	1.0	1.0	High

Net benefit summary

Unit: 2024 ($m)

Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	2025	2026	2027	2028
Total marginal impact	18	43	122	-	-	7	7	7
Total cost of initiative	(17)	(34)	(88)	-	(5)	(5)	(5)	(5)
Net economic benefits	1	9	34	-	(5)	2	2	2

Summary of initiative fiscal cost

Unit: 2024 ($m)

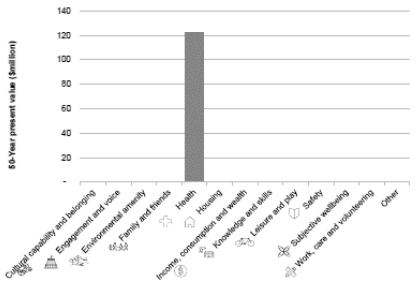
Category	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m	2024	2025	2026	2027	2028
Operating expenses	(17)	(34)	(88)	-	(5)	(5)	(5)	(5)
Capital expenses	-	-	-	-	-	-	-	-

Summary of Initiative

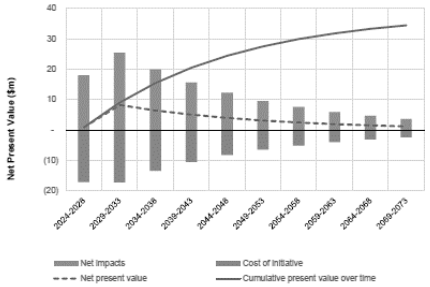
- This proposal (Lurgi Vaccine) performs a Standard CBA for the period of 50 years with a discount rate of 5%. The initiative is about Vaccine for children affected by Lurgi. The target population for this intervention is described as Six year olds receiving vaccine to prevent Lurgi disease in 7-9 year olds , measured by Individuals. The fiscal cost of the initiative / funding being sought is estimated as $88m.
- The Societal return on investment (ROI) is 1.4 with Medium evidence certainty. The Government only ROI is 1. with High evidence certainty.
- The proposal has been self assessed as 1 - Low Value / Returns for overall value for money, with an alignment rating of 4 - High Alignment and a deliverability rating of 3 - Moderate Likelihood of Delivery. The proposal's non-monetised impacts are Low (+). The net economic benefit yields $34m for the 50 years of the intervention.
- The top wellbeing impacts (monetised and non-monetised) are Prevented hospitalisations over the Short term (<5 years), Health gains - Quality-adjusted life years (QALYs) over the Short term (<5 years) and Prevented GP visits over the Short term (<5 years).

Present-day value charts

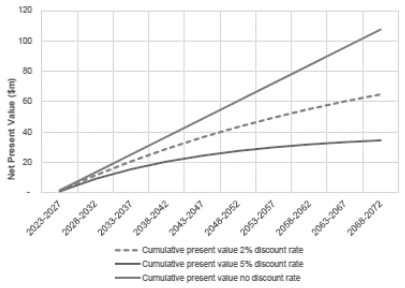
Present Day Value of Impact(s) by Wellbeing Domains



Net Present Value Over Time at 5% discount rate



Cumulative Present Value (by Discount Rate)



Assumptions made and key notes *Explain key modelling assumptions or anything important individuals looking at the model should know.*

It is an ongoing vaccination programme. 62,000 six-year olds per year are expected - flat profile across years. The costs are $100 per vaccinated child. 80% vaccination rate is expected.

Mild cases of the illness have a reduction in average utility of 0.03 for the period of the illness, ie if a child is otherwise in perfect health and they have the illness for one week, they lose QALYs = (0.03 * 1/52). Severe cases of the illness (perhaps identified as those needing hospitalisation) have an average reduction in utility of 0.35 for the duration of the illness.

Modelling assumes mild cases with QALY gains for two weeks. Returns would increase if severe cases were included. Sensitivity analysis for different QALY valuations.

An 80% vaccination rate is expected for six-year olds as the central scenario. The vaccine is particularly effective (95%) at preventing hospitalisation for the 10% most vulnerable. It is also very effective (80%) at preventing hospitalisation in a further 30% of cases. For the remaining 40% vaccinated, the vaccine prevents GP visits (70% effective). Seoondary benefits to for example parents and schools are un-monetised. These are expected to be moderate.

IN-CONFIDENCE

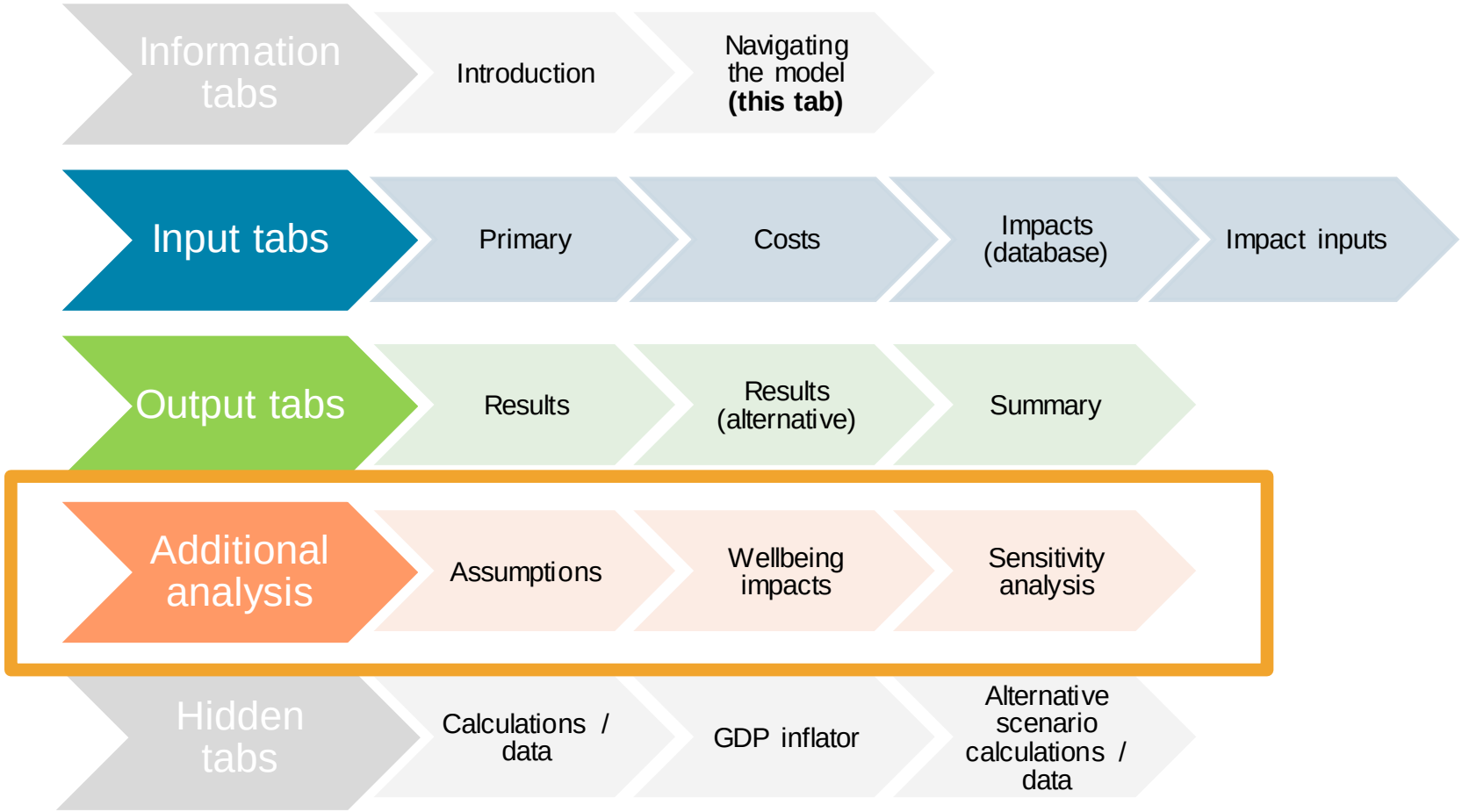
Impacts Summary

This table summarises the impacts and the net values across 5-year, 10 year and 50-year time horizons in today's dollars. The table also highlights the quality of the evidence. The table gives a quick sense of which impact is driving the bulk of the overall return on investment. Here hospital visits have the highest net value ($54 and $21 million over the period compared with other impacts), evidence quality for this impact is also high so we can have some confidence in the results.

Impact summary

	Evidence Quality	Gov./ Non-Gov.	Who affected?	Wellbeing Domain	Impact Description	5-Year NPV $m	10-Year NPV $m	50-Year NPV $m
Impact 1	High	Gov.	health sector, patients	Health	Inpatient hospital visit	8	19	54
Impact 2	High	Gov.	health sector, patients	Health	Inpatient hospital visit	3	8	21
Impact 3	Low	Gov.	health sector, patients	Health	GP visit (20 minutes) - Publicly funded (Government contribution)	1	2	5
Impact 4	Low	non-Gov.	parents of 7-9 year olds	Health	GP visit (20 minutes) - Publicly funded (patient co-payment)	0	1	4
Impact 5	Medium	non-Gov.	7-9 year olds	Health	Quality-adjusted life year (QALY) gained (central) based on Pharmac	2	6	16
Impact 6					Quality-adjusted life year (QALY) gained (high) based on VoSL	-	-	-

Navigating CBAx



IN-CONFIDENCE

Wellbeing Impacts

Wellbeing Impacts

You can include information from the auto-populated table B below as appropriate.

Also include non-monetised impacts that are not modelled in CBAx.

Wellbeing Impacts table. Summary of monetised and non-monetised impacts.

Reference	Impact description	Affected	Timeframe	Wellbeing domain	Magnitude / Present value	Quantification, assumptions and evidence	Evidence quality
Impact 1	Prevented hospitalisations	Health sector savings - re-allocated within health for other patients	Short term (<5 years)	Health	$76m pv	95% effective at preventing for 6,200 (10%) most vulnerable children 80% effective at preventing hospitalisation for a further 18,600 (30%) children	High
Impact 2	Health gains - Quality-adjusted life years (QALYs)	7-9 year olds	Short term (<5 years)	Health	$37m - $55m pv	The QALY value based on Pharmac data is low. An alternative estimate using the value of statistical life is more comparable with values used internationally.	Medium
Impact 3	Prevented GP visits	Health sector savings and savings for parents' co-payments. About 50%/50%	Short term (<5 years)	Health	$9m pv	70% effective at preventing GP visits for 24,800 (40%) children	Low
Impact 4	Prevented time off work for parents	Parents of sick children	Short term (<5 years)	Health	moderate	One parent (or another caregiver) may need to stay home to care for sick children.	Low
Impact 5	Prevented school disruption from school closure to stop the disease spread	Schools - teachers and children	Short term (<5 years)	Health	low	In some cases, schools have had to close for up to a week, to get an outbreak under control.	Low
Impact 6	Costs to taxpayers	Taxpayers	Short term (<5 years)	Income, consumption and wealth	($88m) pv	There is an ongoing cost of providing the intervention, funded through tax revenue.	High
Impact 7							

IN-CONFIDENCE

Sensitivity analysis

Sensitivity Analysis

Results from Outputs Summary tab — *Discount rate* — Copy and paste your results in column C or D into this table, when you have changed the assumptions in the model.

Net benefit summary 50-year PVs		*5%*	*2%*	*Central*	*Worst case*	*Best case*	*Scenario A*	*Scenario B*	*Scenario C*
Initiative costs present value i.e. Government investmer	$m	(88)	(153)	(88)			(88)		
Government impacts $m		84	148	81			81		
Wider societal impacts $m		39	69	37			55		
Total societal impacts, net present value $m		34	65	30			48		
Non-monetised impacts		Medium (+)	Medium (+)	Low (+)			Low (+)		
Benefit cost ratio, Societal Total (50y)		1.4	1.4	1			2		
Return on Investment, Societal Total (50y)		1.4	1.4	1			2		
Return on Investment, Government only (50y)		1.0	1.0	1			1		

Description of case / scenario. Set out the key assumptions.	
Central	Conservative assumptions - Low QALY value
Worst case	
Best case	
Scenario A	Assumptions - Higher QALY value more comparable internationally. Only change to the model is on the Impact Inputs sheet in column L. Switched on impact 6 (the higher QALY assumption) by setting length of impact to 0.04 (15 days). Switched off impact 5 (lower QALY assumption) by setting length of impact to zero.
Scenario B	
Scenario C	

IN-CONFIDENCE

A reminder about step 6…

Do the results look clear enough / make sense?

Policy evaluation *using CBA on each feasible option*	
Inputs to CBAx	**Step 1:** Define policy and counterfactual **Step 2:** Identify those who gain and those who lose **Step 3:** Identify the benefits and costs; allocate to time periods
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs
Outputs from CBAx	**Step 6:** Is the result clear enough? If not, consider whether it is worth investing in more research, repeat previous steps **Step 7:** Write report

Once you have finalised the CBAx analysis, you should incorporate your findings into your advice.

You can incorporate the monetised net present values for impacts and the overall results into the budget initiative template.

IN-CONFIDENCE

Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

IN-CONFIDENCE

- What is CBA, when to do it, and why to do it?
- How to evaluate CBAx outputs
- How other methods complement a CBA

IN-CONFIDENCE

Combine CBA with other tools

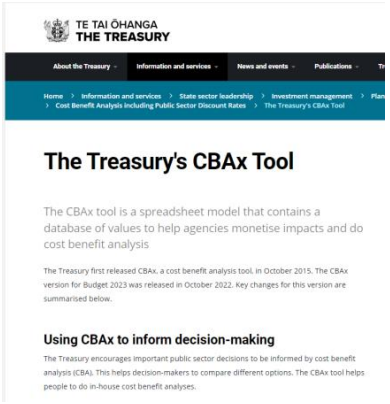
- Which policy phase?
  - Strategic e.g. Scenarios, Risks
  - Option evaluation e.g. CBA, MCA, CEA
- Alternatives to CBA?
  - MCA Decision criteria in regulatory impacts
  - CEA cost-effectiveness analysis – one impact
  - CUA cost-utility analysis – Health QALYs
- Qualitative and quantitative

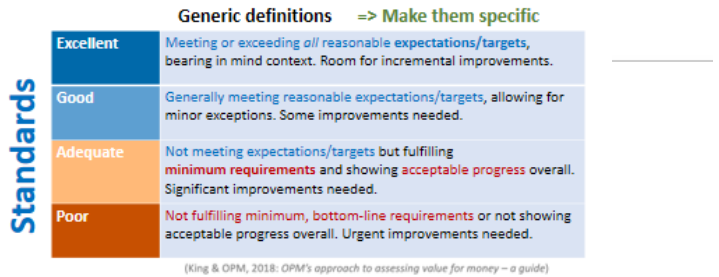
The Policy Project

Policy improvement frameworks

Policy Methods Toolbox

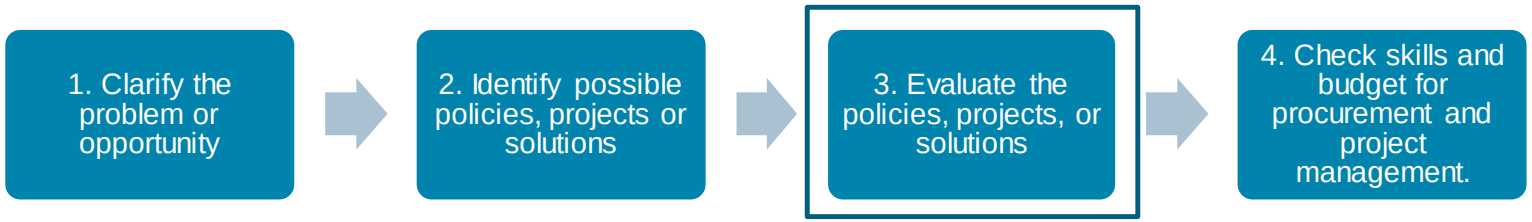
Case studies
We've brought together





Part of Policy

- CBA steps fit within the policy process



- CBA is part of policy advice – **evaluation of options**
  - What are the options? Use other policy tools
  - What option(s) is preferred? How do options compare? CBA +

- Apply judgement - CBA is *not* deterministic

Value-adding policy

Each policy option

describes a different way of intervening to

- **achieve the policy's purposes**
- **address the problem or opportunity**

Tips

- Ask good questions and iterate
- Engage others and include a range of perspectives
- Simplify and discipline through frameworks and tools
- Use (available) evidence – qualitative/quantitative

IN-CONFIDENCE

Use a combination of approaches

How to design and assess policy options, the role of criteria and the challenges of estimating outcomes

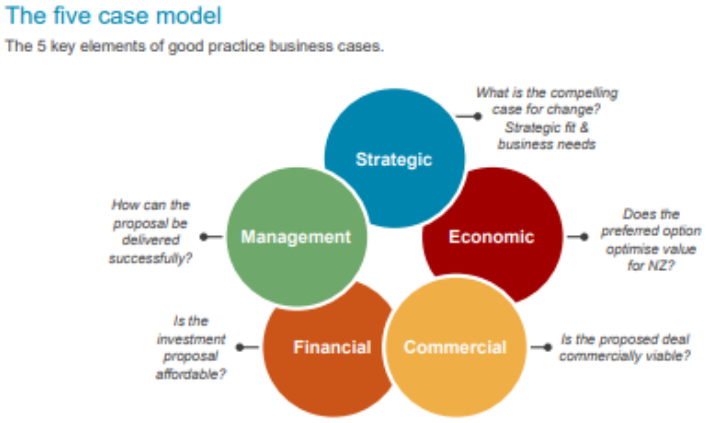
- **Outcomes matrix**
  - What are the policy objectives?
  - How would you know? How measure?
  - Weightings? What do we care most about?
- **Causation and interdependencies**
  - Problem systems mapping – understand problem and identify options
  - Intervention logic testing – understand consequences of intervention options
- **Impacts**
  - Living stand framework and wellbeing analysis
  - **Cost benefit analysis** – value gains and losses across society
- **Uncertainty and conditions**
  - Risk analysis
  - Scenario
  - Conditional – if x, then y

IN-CONFIDENCE

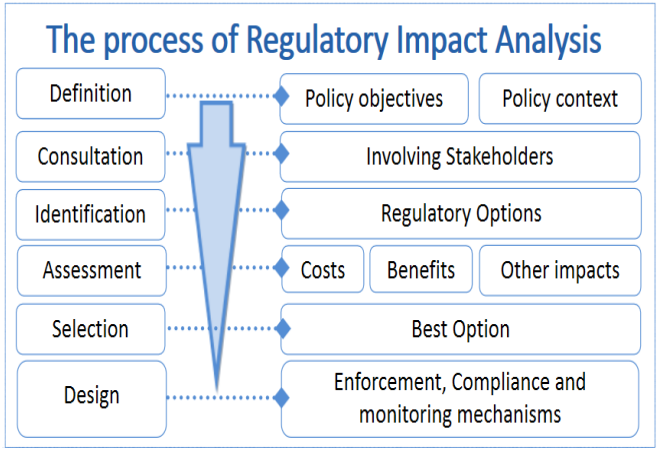
Use CBA in policy, business case, RIA

- Part of policy ANALYSIS, informs ADVICE
  - Ministerial briefings, Cabinet papers, Budget
- Informs the ECONOMIC business case
  - Investment management
- Informs regulatory IMPACT analysis

Source: DPMC Policy Project



Source: The Treasury



Source: OECD, Courtesy MBIE. See Treasury guidance

IN-CONFIDENCE

CBA builds on early analytical phases

- Problems, opportunities, scenarios and risks
- Alignment, system, priorities and objectives
- Engagements, exploration, data and evidence
- Strategy, transformation and intentions

Figure 2: The policy hierarchy: The Five Case Model

Strategic dimension	**What is the case for change, including the rationale for intervention?** What is the current situation? What is to be done? What outcomes are expected? How do these fit with wider government policies and objectives?	← This should be the focus of much of the analytical work for transformative change
Economic dimension	**What is the net value to society (the social value) of the intervention compared to continuing with Business As Usual?** What are the risks and their costs, and how are they best managed? Which option reflects the optimal net value to society?	← CBA is focused on comparing policy options here
Commercial dimension	**Can a realistic and credible commercial deal be struck?** Who will manage which risks?	
Financial dimension	**What is the impact of the proposal on the public sector budget in terms of the total cost of both capital and revenue?**	
Management dimension	**Are there realistic and robust delivery plans**? How can the proposal be delivered?	

Source: Author based on HM Treasury (2022)

Source: MBIE

IN-CONFIDENCE

Common alternative tools – CEA, CUA, MCA

Cost effectiveness analysis (CEA) and cost utility analysis (CUA)

- Involve converting the benefit into ONE common non-monetary units
  - Eg, Safety: Prevented deaths on roads (CEA)
  - Eg, Health: Quality adjusted life years (CUA)
- Compare the cost of achieving a given outcome between options
- Avoid putting a $ value on impacts
- Appropriate only if the effects are identical

Multi-criteria analysis

- Often provided in Regulatory Impact Statements, instead of providing CBA
- Criteria / objectives are identified - wide range of criteria or objectives
- Options are rated for against objectives: better/worse (++, +, -, --)
- Criteria can be weighted (subjective)
- Ratings can be weight-summed to obtain a score
- Costs and benefits are not monetized, and value to society is not clear

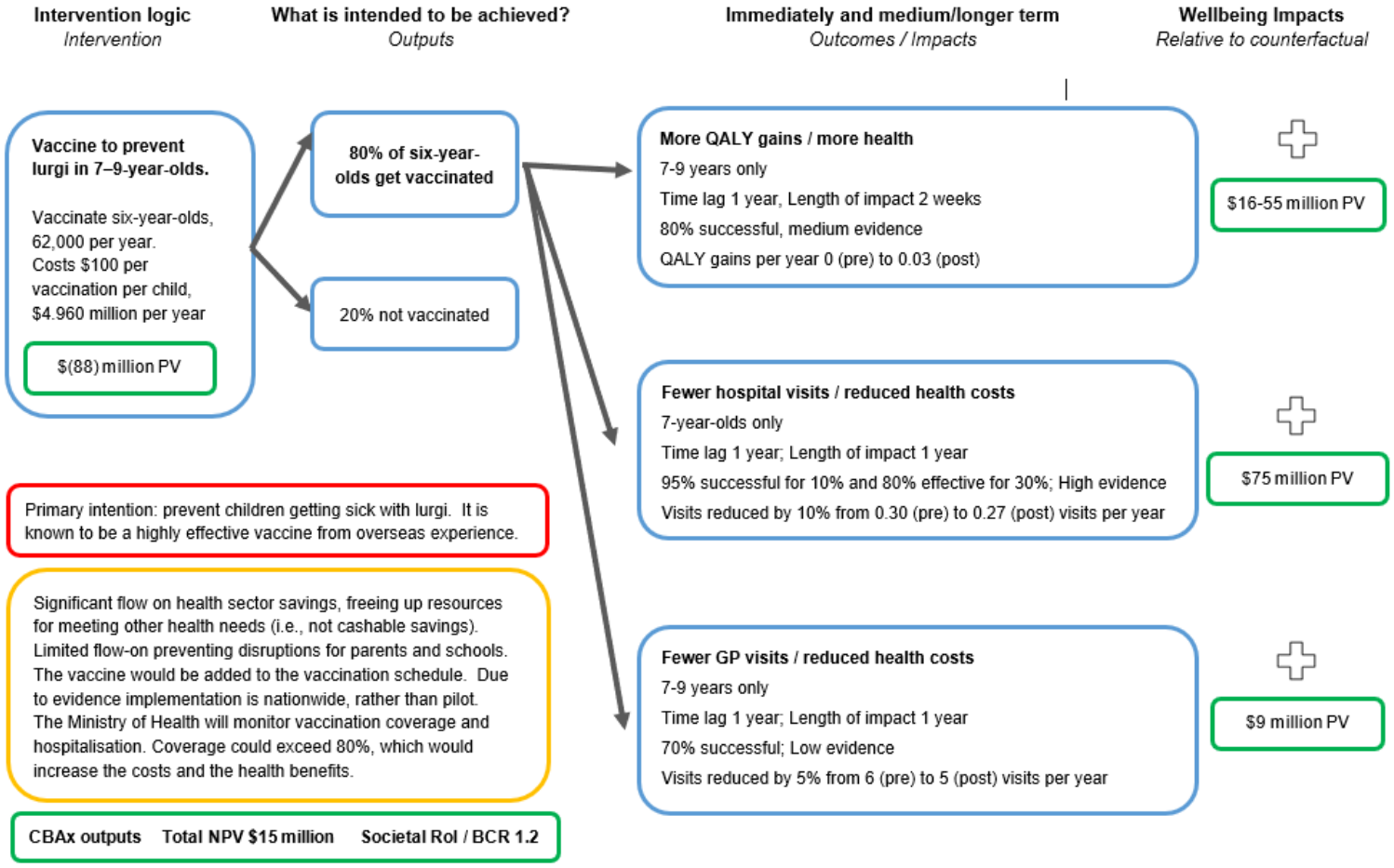
IN-CONFIDENCE

Multi-criteria Analysis

Response to policy problem/opportunity		***2. Options***		
1. Criteria *Broad and specific (weighted)*		Current	A	B, C, etc
Effective	1 Objective 1 (less harm)			
	2 Objective 2 (more gains)	***Impacts*** Predicted outcomes Qualitative or quantified May reflect weighted criteria		
Efficient	3 Value for money (allocative)			
	4 Affordable, low costs (fiscal)			
Equity	5 Vertical (different, need)			
	6 Horizontal (like, equality)			
Etc	etc			
Total	***Recommendations***			

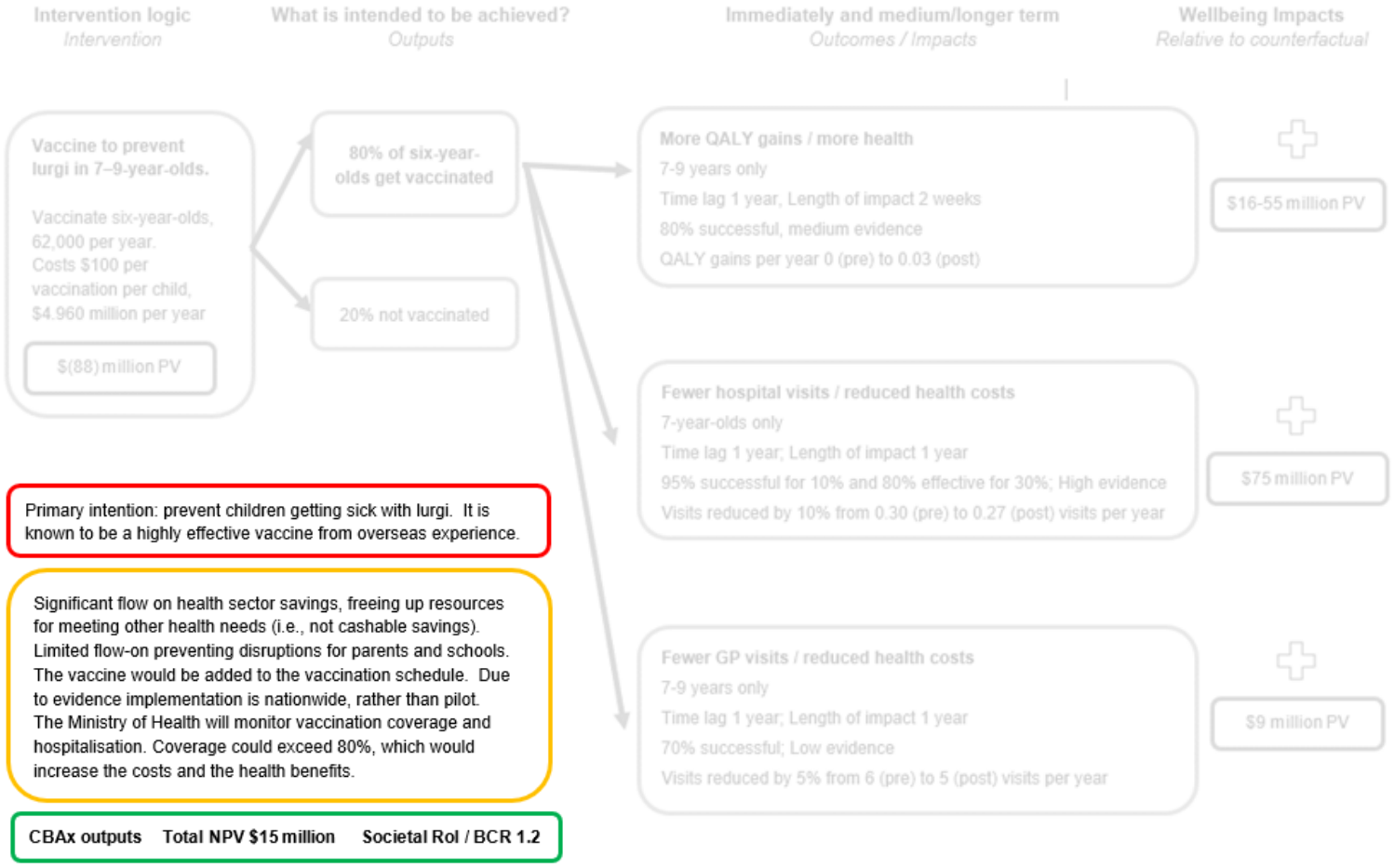
IN-CONFIDENCE

Intervention logic – Primary Inputs



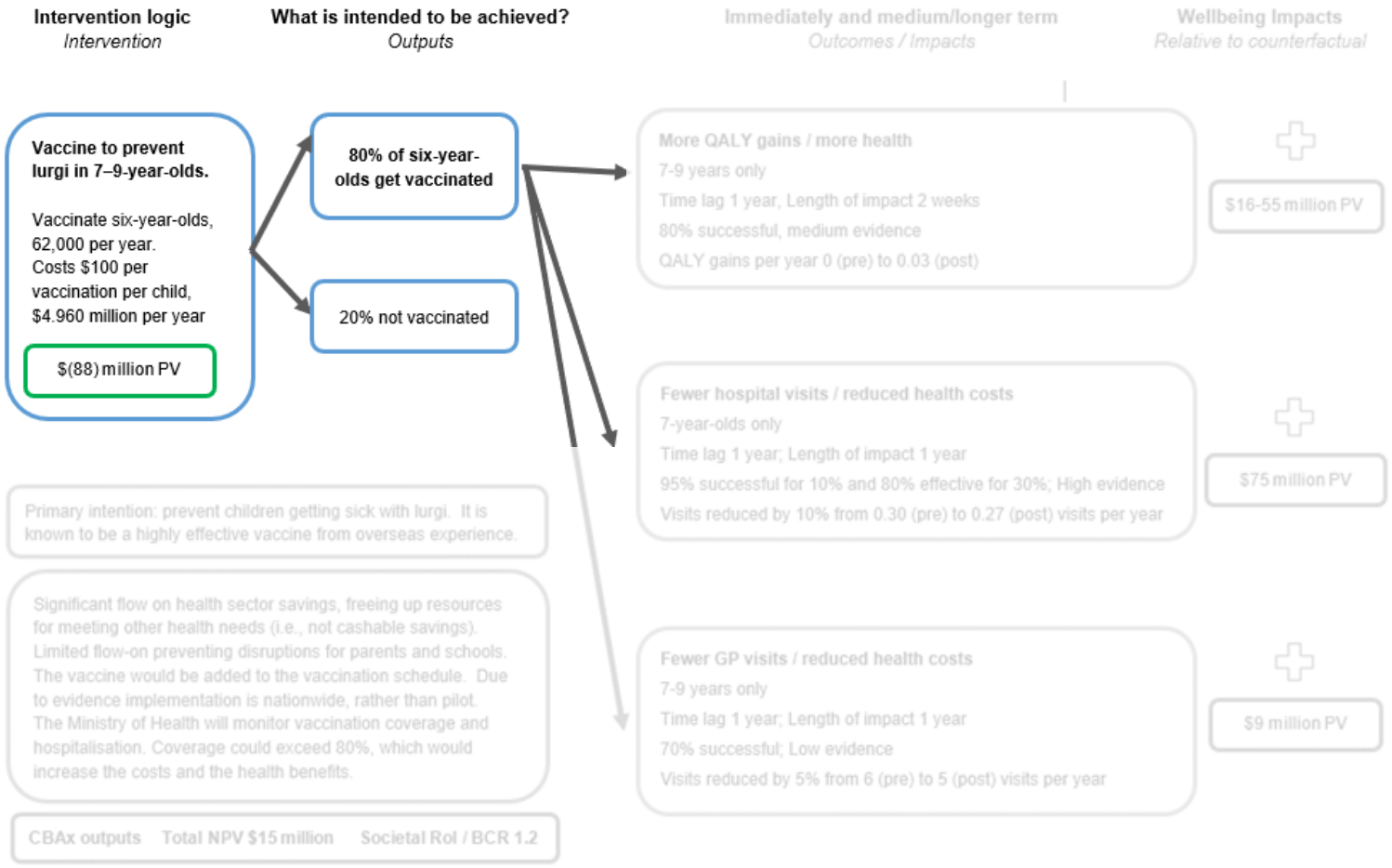
IN-CONFIDENCE

Consider your primary intention



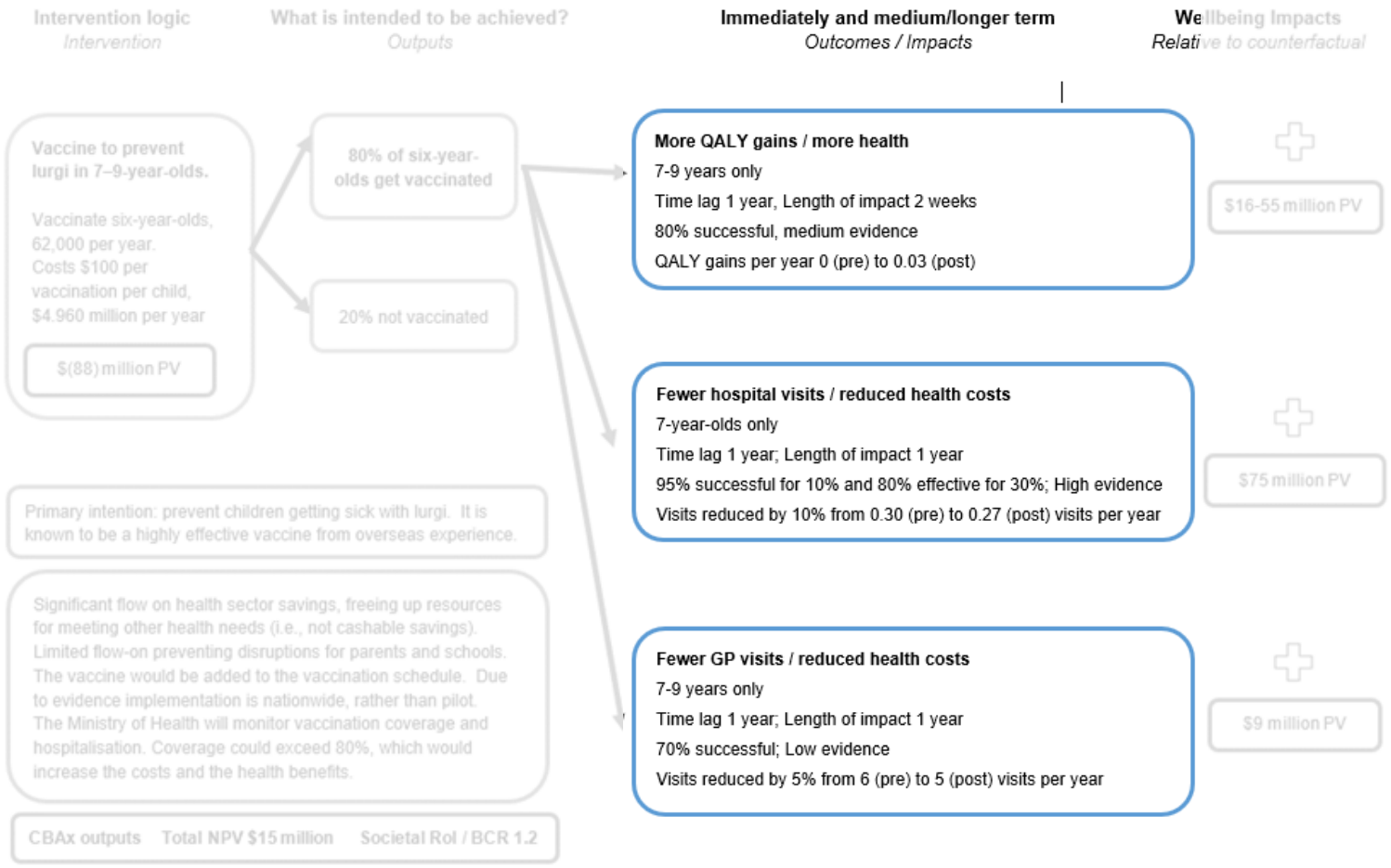
IN-CONFIDENCE

What is the group impacted? How much will it cost?



IN-CONFIDENCE

What are the specific impacts on this group?



IQM

Identify, quantify and monetise

Levels	Effort / cover of impacts	Comment
1. Identify	Comprehensive • Positive and negative • All people • Total Economic Value	• Think broadly • Link with other agencies/ perspectives • Indicate across domains and in intervention logic
2. Quantify a subset of identified impacts	To extent/where possible • Impact assumptions • Put most effort into the most significant impacts • Include in wellbeing analysis as non-monetised	• What do you know? • Important impacts may be outside the sector and expertise, ie don't focus on what you know most about • Iterate, eg, run quick CBAx analysis to help guide efforts and research • Indicate magnitude in final advice
3. Monetise a subset of quantified impacts	Selective and robust • Significant impacts • Good evidence base	• Focus monetisation on key 1-3 impacts, to include in final advice • Provide present values for the key impacts

IN-CONFIDENCE

Pātai / Questions?

Photo credit: Chris Chapman
Description: Fox Glacier Valley

IN-CONFIDENCE

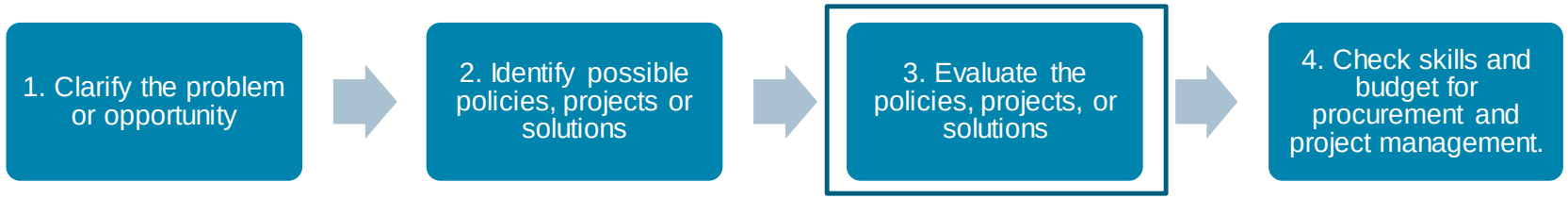
Key takeaway

Photo credit: Hamish Dick
Description: Te Paki, near Cape Reinga, Northland

IN-CONFIDENCE

The 7 steps of a CBA and inputs to CBAx

CBA is part of the **evaluation stage** of the policy development process. It is a method for assessing proposed options that have been developed to respond to a policy problem



Using CBAx is a 7-step evaluative process as follows:

Policy evaluation *using CBA on each feasible option*	
Inputs to CBAx	**Step 1:** Define policy and counterfactual **Step 2:** Identify those who gain and those who lose **Step 3:** Identify the benefits and costs; allocate to time periods
Analysis in CBAx	**Step 4:** Quantify the benefits and costs within ranges **Step 5:** Discount to a common period, compare benefits and costs
Outputs from CBAx	**Step 6:** Is the result clear enough? If not, consider whether it is worth investing in more research, repeat previous steps **Step 7:** Write report

IN-CONFIDENCE

Rōpū rārangi take (online October to November on Monday 2 pm – 3 pm)

Lifting CBA practice 2023 series

Date	Agenda
Slides available online: Session #1	**Learn and develop** • CBAx update for Budget 2024 • Budget 2023 CBAs experiences • Intervention logic and a CBA (and other methods)
Mon 9 Oct 2 – 3 pm	**CBA and evaluation** • CBA – why, when and what (overview of the 7 steps) • Evaluating CBAx summary outputs • How other methods complement a CBA
Wed 18 Oct 2 – 3 pm	**Value for Money in Budget 2024** • Applying a value for money lens • Panel – insights into how Treasury looks at CBA submissions
Tue 24 Oct 2 – 3 pm	**Different aspects and approaches to CBA** Panel - Living Standards Framework (Wellbeing), He Ara Waiora (Te Ao Māori), Social Investment, Outcomes / Performance Reporting
Mon 30 Oct 2 – 3 pm	**Worked example of a basic CBA** Guest speaker - TBC
Mon 6 Nov 2 – 3 pm	**Cost pressures, reverse analysis and sensitivity analysis** When do we do it, why do we do it and how do we do it?

Date	Agenda
Mon 13 Nov 2 – 3 pm	**Dive into the Impacts Database and how to include non-monetised impacts and add new impacts**
Mon 20 Nov 2 – 3 pm	Topic TBC – Climate change / transformational change using CBA and other methods.
Mon 27 Nov 2 – 3 pm	Topic TBC – Ex-post analysis and CBA Guest speakers – Wellbeing Researchers Panel

Future series – monthly from January 2024!

Email cbax@treasury.govt.nz with session topic suggestions.

IN-CONFIDENCE

We are here to help...

Get in touch via the CBAx email address here at Treasury:

cbax@treasury.govt.nz

The email **is** monitored and also comes to both Kirsten and me.

IN-CONFIDENCE

Pātai / Questions?
Hei tērā Rāapa!

Photo credit: Chris Chapman
Description: Fox Glacier Valley