

Research
Education
Outreach

CCA



Fondazione
Compagnia
di San Paolo



UNIVERSITÀ
DEGLI STUDI
DI TORINO

Opening Ceremony of the Academic Year 2024-25

Torino, 11 November 2024



Charting the Unknown: Economic Challenges in an Uncertain Macroeconomy

Federico Ravenna
Intesa Sanpaolo Chair in Economics

The Science of Modeling the Macroeconomy

Models: explain the past, forecast the future

- The range of possible outcomes has widened
- The uncertain future is not so distant
- 'Animal spirits' : getting more complex and influential





Pessimism and Commodity Price Uncertainty

UNCERTAINTY
AND PESSIMISM

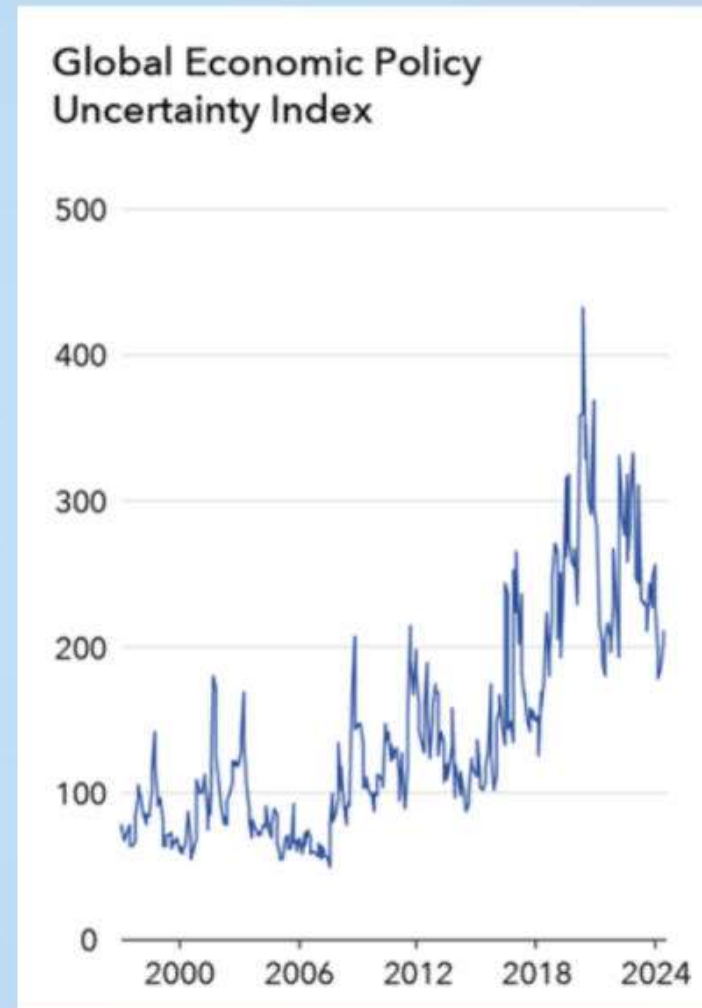
EURO AREA
WAR
SCENARIOS

Uncertainty vs Expectations

Pessimistic expectations: low prospects for the outlook of the economy

Uncertainty: the range of possible outcomes widens - higher probability of more extreme events

Economic Policy has become progressively less predictable and more uncertain



Estimates of the impact of uncertainty

-What is the impact on the economy of heightened uncertainty in commodity prices?

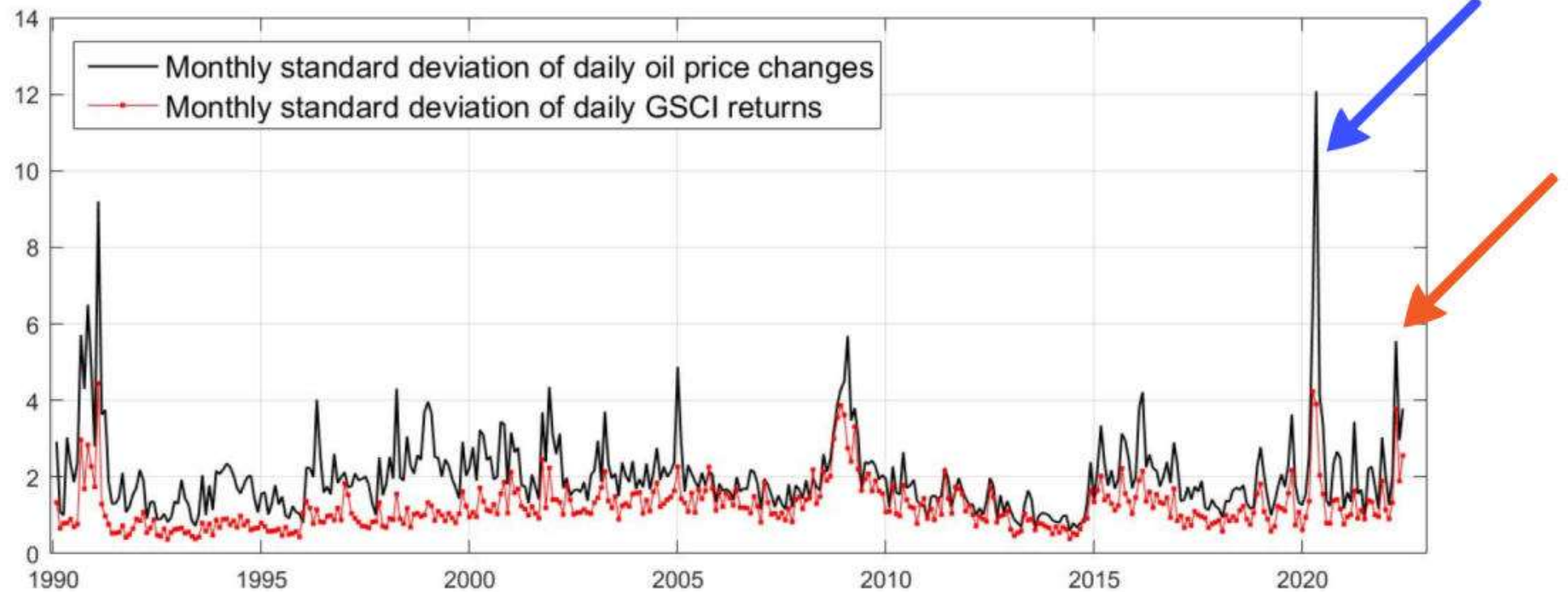
-What is the role of consumer sentiment in the propagation of this shock?

Estimate how the impact of **uncertainty in Euro Area** changes according to the state of the **average outlook** for the economy

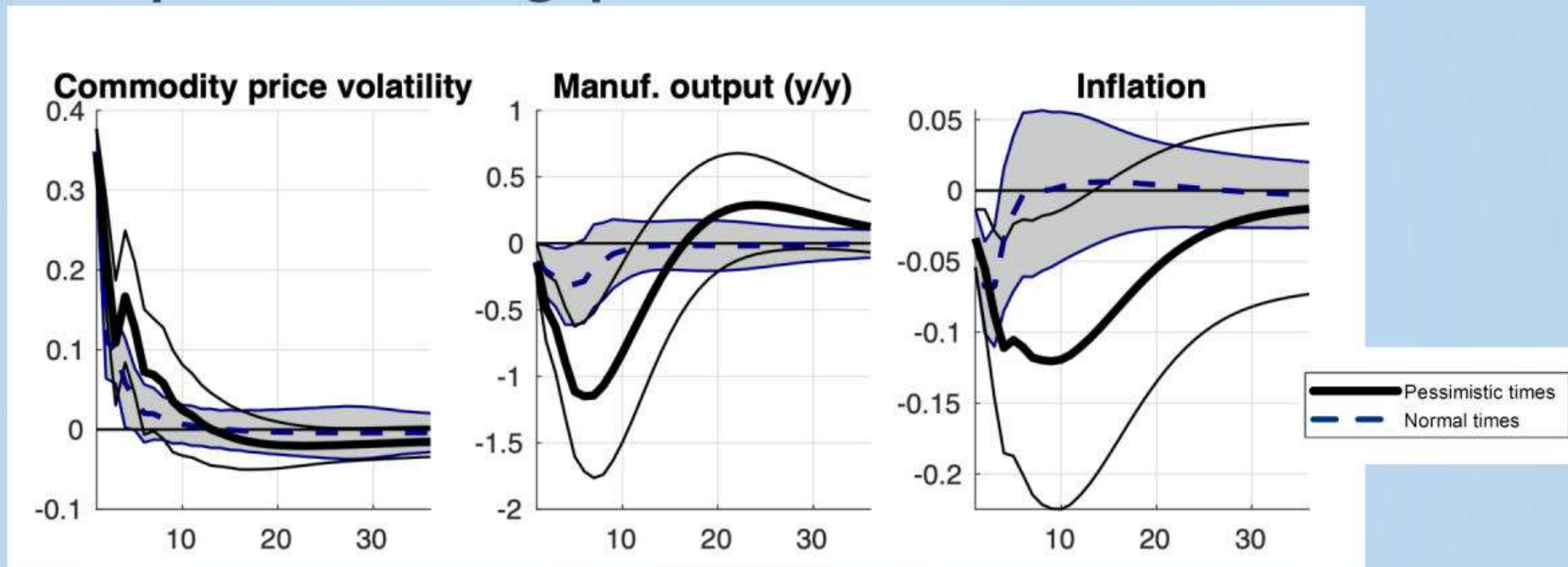
Commodity Price Uncertainty: Risks

- Impact of high energy prices on consumer demand
- Reorientation in energy trade flows
- Competition for energy provisions while new LNG supplies go online
- Policy changes aimed at energy security

Commodity Price Uncertainty

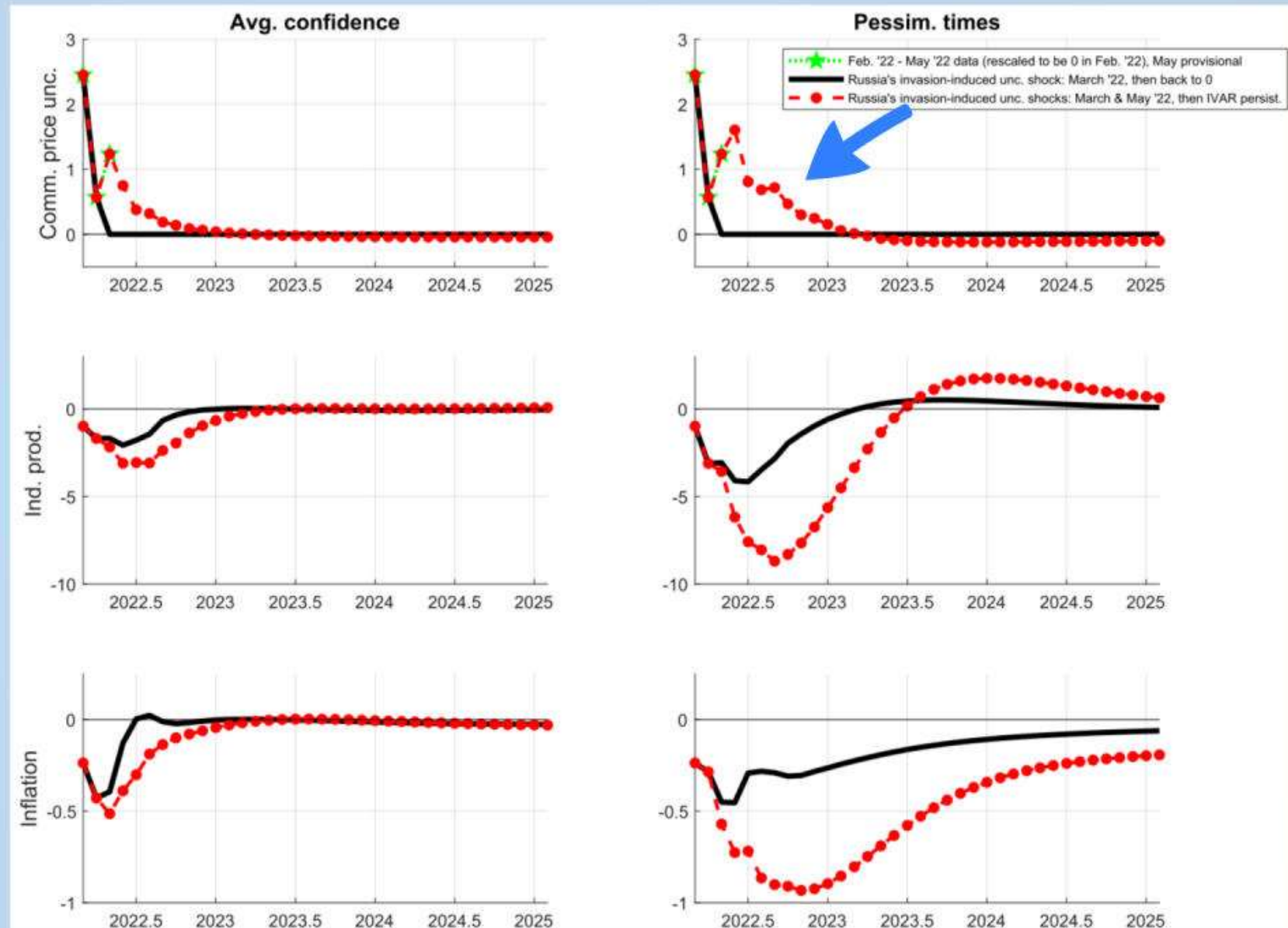


1. Impact during pessimistic times



Result: Real activity and inflation decrease in both states of the economy, but their decrease is more than three times larger, and more persistent, during pessimistic times

2. A war scenario



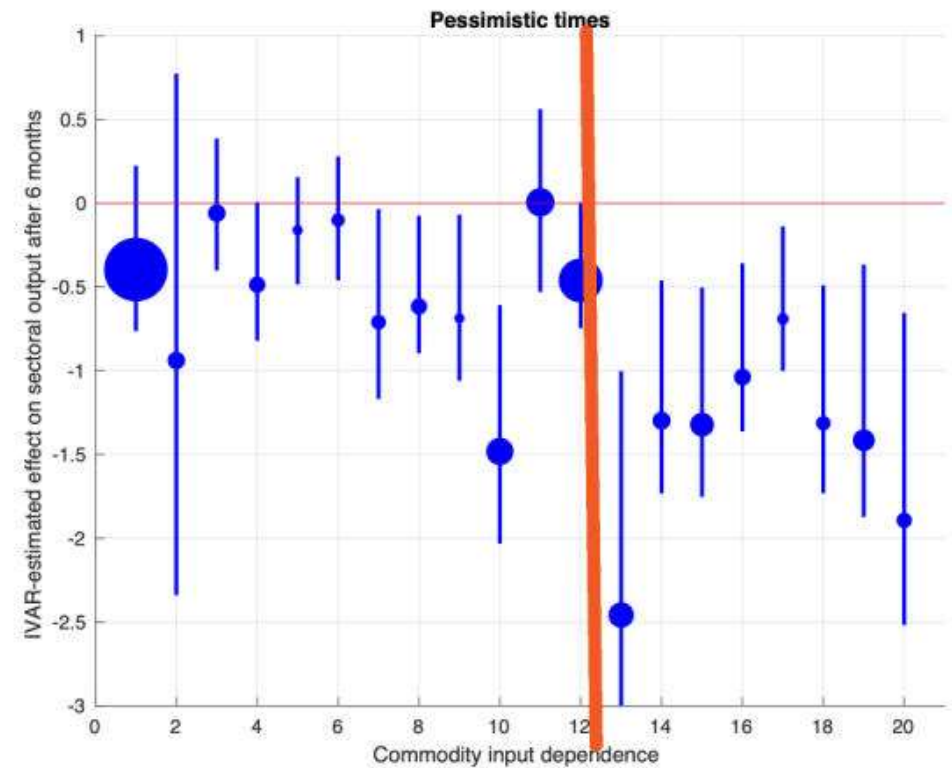
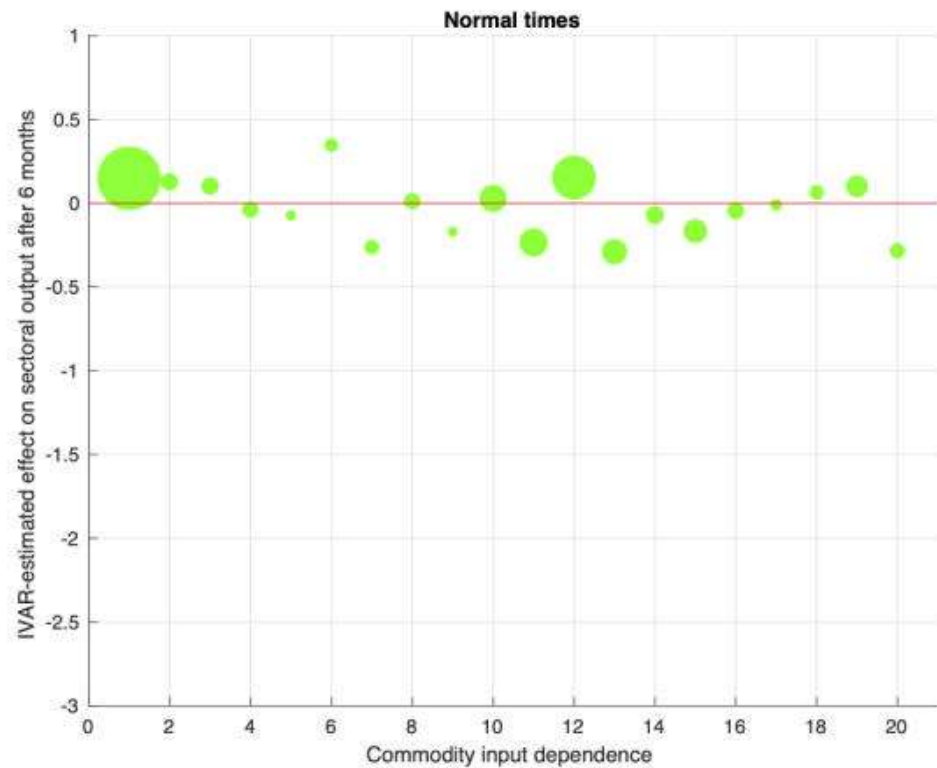
3. Commodity-dependent sectors

Does uncertainty work through supply or demand?

Rank Input-Output tables industries by the input-share of commodity in their final output. This procedure accounts for the commodity-content across all production chain.

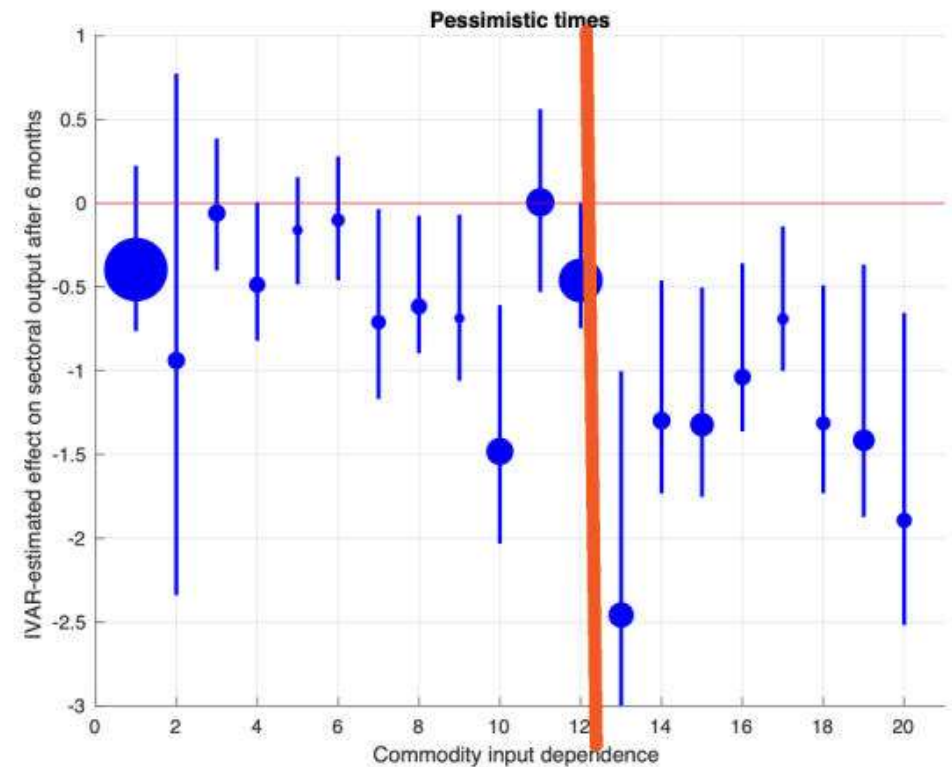
Compute IVAR using corresponding sectoral output

3. Commodity-dependent sectors



3. Commodity-dependent sectors

<i>Commodity input dependence:</i>		<i>(% of total value)</i>
13. Motor vehicles	2.45	(1.70%)
14. Electrical equipment	2.50	(0.86%)
15. Fabricated metal products	3.10	(1.50%)
16. Rubber and plastic products	3.46	(0.76%)
17. Paper and paper products	3.66	(0.36%)
18. Other non-metallic minerals	7.44	(0.56%)
19. Chemicals	8.02	(1.26%)
20. Basic metals	10.29	(0.63%)



Uncertainty in Pessimistic Times

- Pessimistic expectation over average outlook translate into large impact of commodity price uncertainty shocks on economy
-
- Increases in uncertainty in commodity price alone -as seen in 2022 - can lead to a drop in Euro Area industrial production of 3.5% to 9%



One-sided risk: climate change

WHAT IS THE
BASELINE
COST?

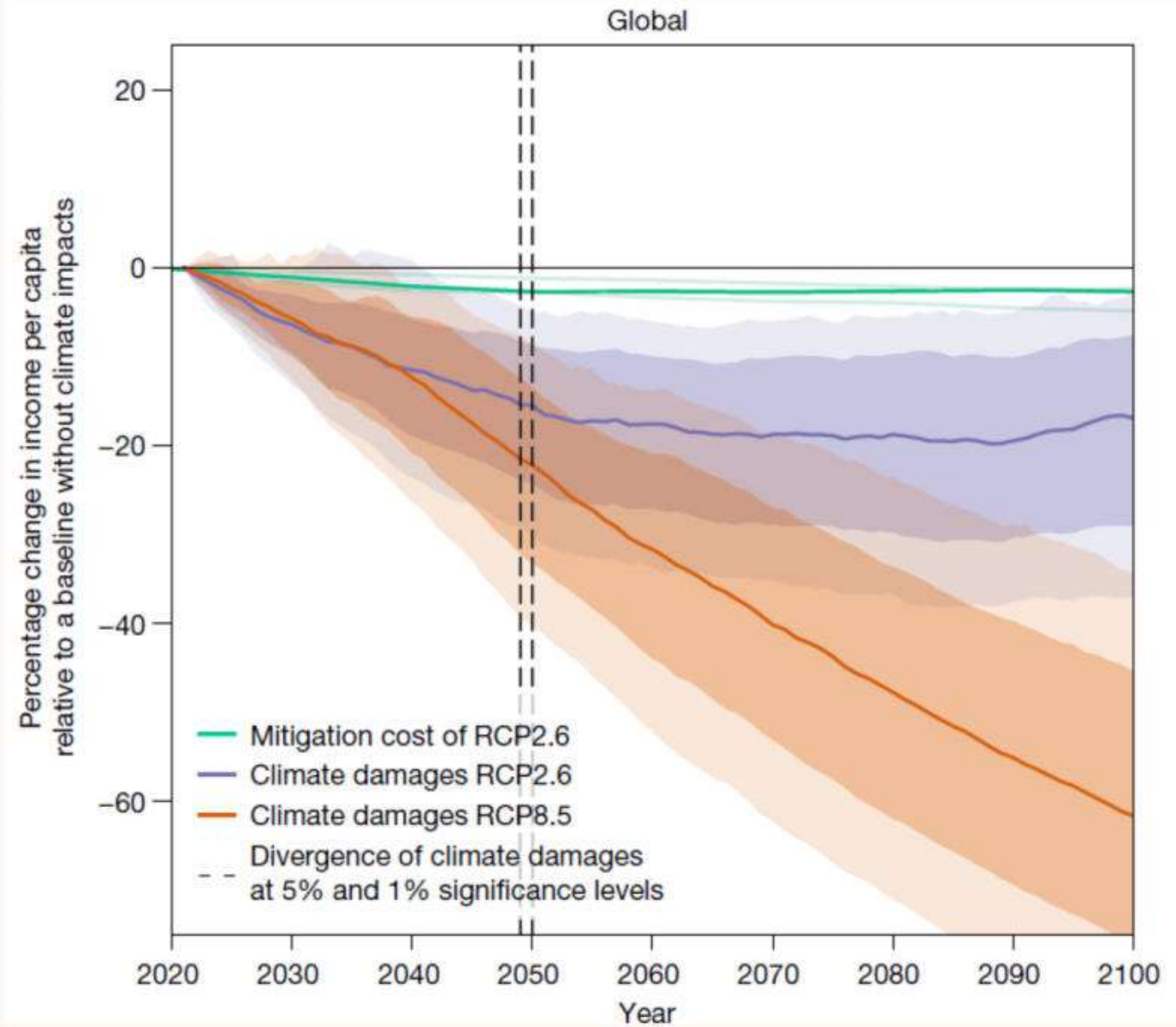
WHAT IS THE
COST FOR
POLICY?

What is the baseline cost? Behavioral models

"The world economy is committed to an income reduction of 19% within the next 26 years independent of future emission choices (relative to a baseline without climate impacts)"

(Nature, 2024)

What is the baseline



What is the baseline cost? Behavioral models

Estimates based on behavioral models.

Derive optimizing behaviour of firms, households, in response to changes driven by climate scenario.

Challenge:

Set of mechanisms through which climate change can influence economic outcomes is complex, operating through myriad of channels

Advantage:

Can build economic scenarios allowing for agents to respond optimally

What is the baseline cost? Statistical models

Estimates based on statistical models.

Use past data and reaction of the economy to driving shocks to forecast the future behaviour

(Many) challenges:

- **We do not have a 'climate shock' in the past time series**
- **Not reliable to make projections in the far-ahead future**
- **Not useful to model changes in optimizing behaviour in response to new policies or structural changes**

What is the baseline cost? Statistical models

Research Goal

Use statistical macroeconomic models to estimate from past data the impact on the economy of a **synthetic** 'climate change' transition shock.

This estimate would provide the **baseline cost** - under current policies - of the climate change transition, in the short to medium term.

This estimate is what policymakers (and financial markets) need to build shorter term assessment of the 'climate change' transition shock

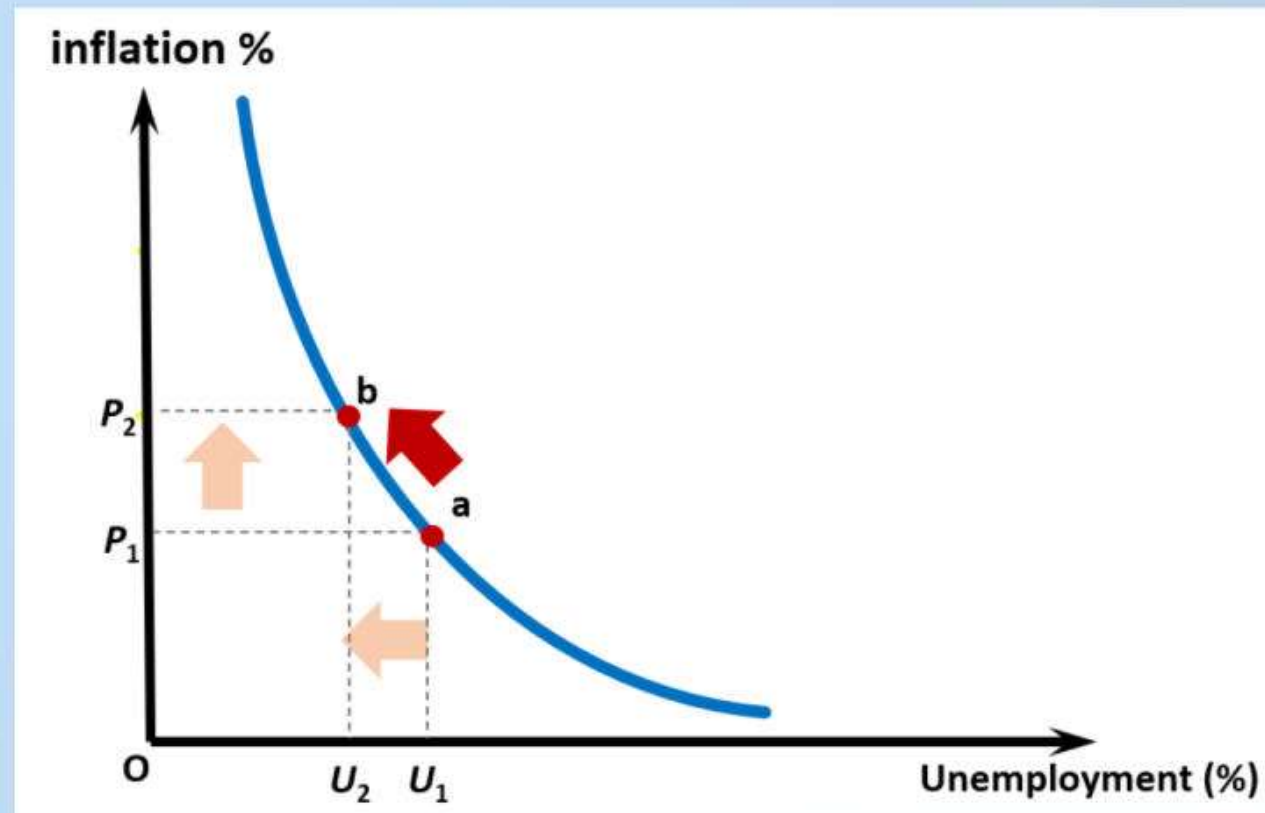
What is the cost for policy?

Policymakers need to measure **trade-offs** between different objectives for their policy

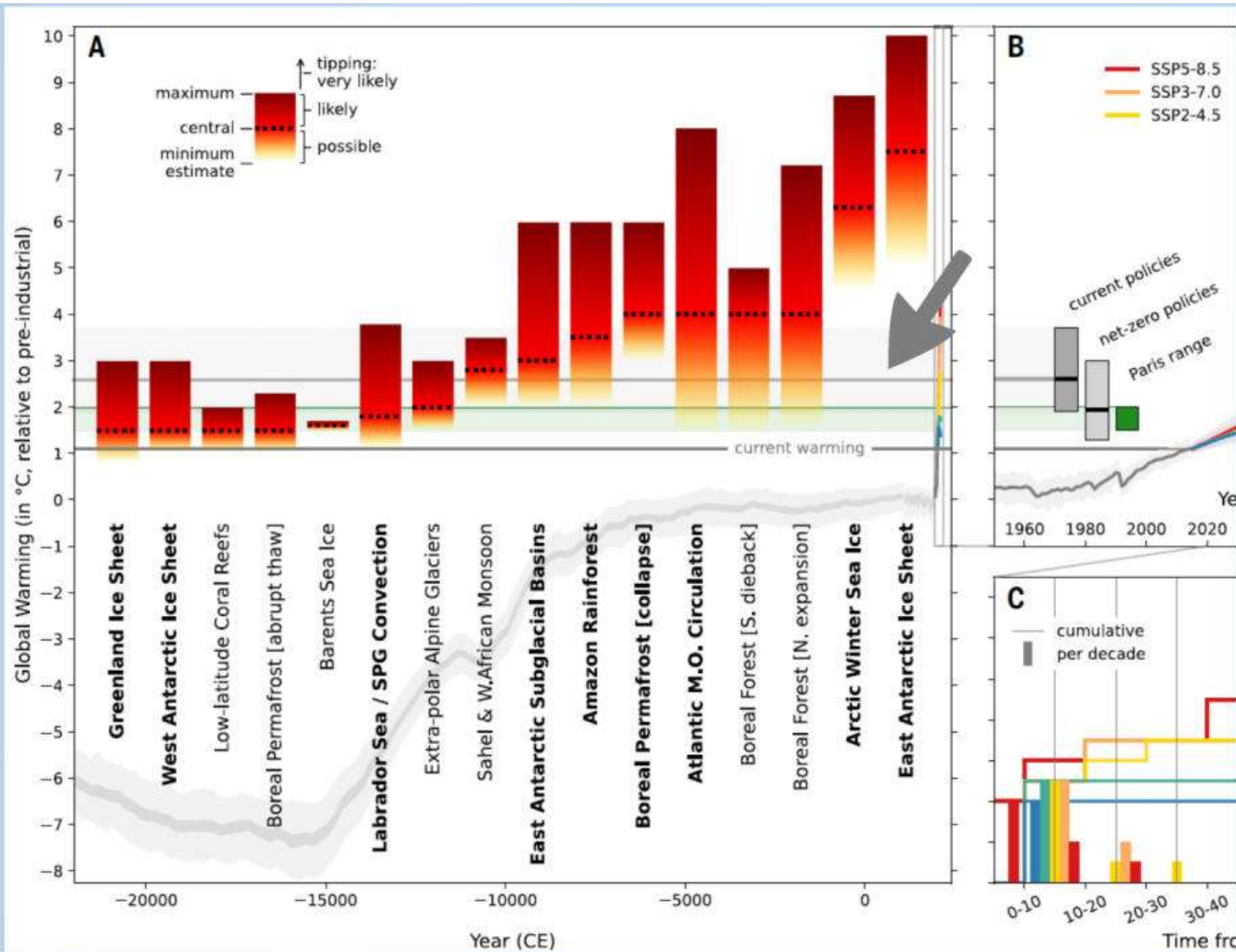
- For a central bank faced with a recession / a banking crisis / high inflation...
- ...how should policy change when **trading-off short-term goals with climate change goals?**

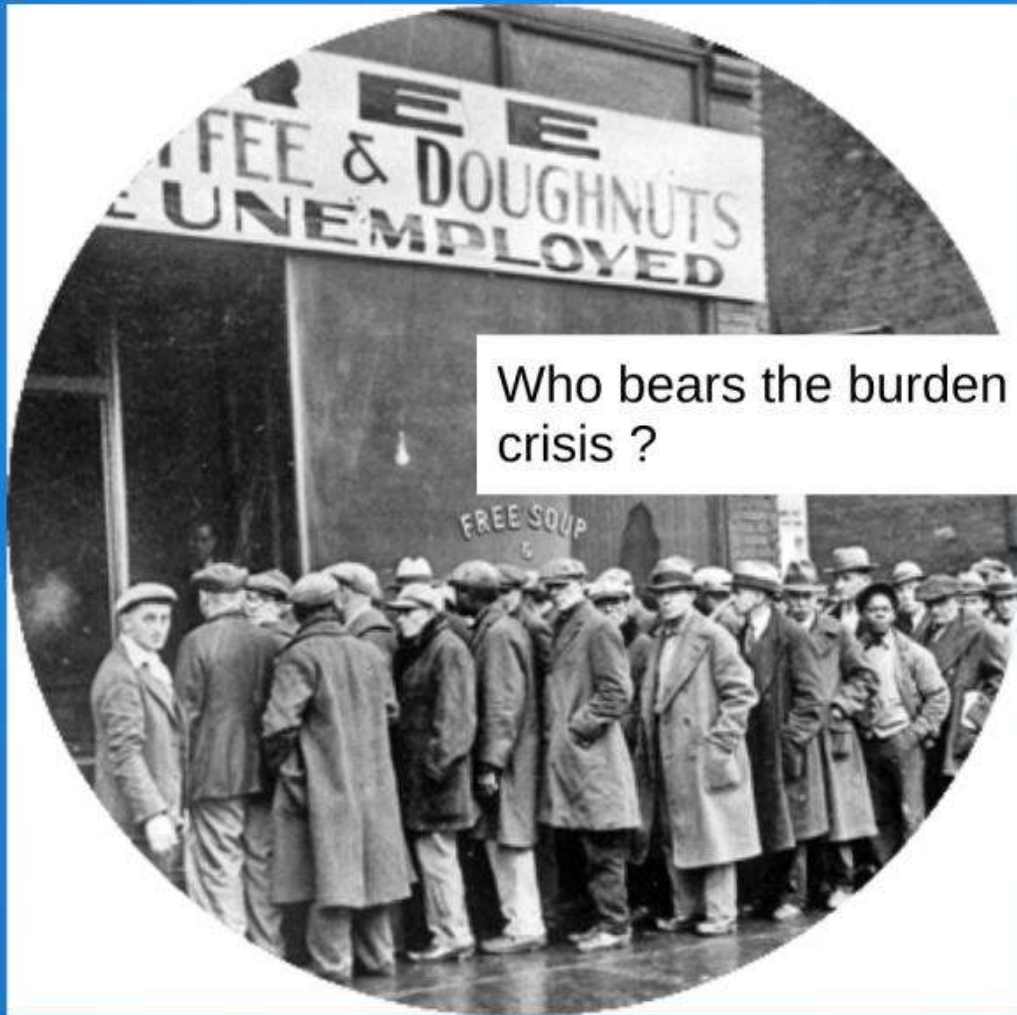
What is the cost for policy?

- Standard practice: the **'space of outcomes'** is constant, policy faces trade-offs drawn from a constant pool of events
- With climate change: space of outcomes is changing. There is a **finite horizon**



Climate Tipping Points





Who bears the burden of a crisis ?

UNEMPLOYED
IN RECESSION

A COVID
RECOVERY

INCLUSIVE
MONETARY
POLICY

Who is unemployed in a recession?

- Mean **human capital** of employed workers **increases** during recessions conditional on observable characteristics (Grigsby, 2020)

Inclusive monetary policies

Does running the economy hot for an extended time reduce inequality and improve outcomes disproportionately for low-income households? *At what cost?*

Goals of an inclusive policy

- Reduce inequality by improving the extensive margin and making employment accessible to low-productivity workers

CAN POLICY REDUCE INEQUALITY in OUTCOMES?

A metric to measure inclusive policies

Table 2: Outcome for Alternative Policies

	Alternative policies			
	(1)	(3)	(4)	(5)
Variables in policy rule	π	π, U	π, U	AIT
Response coefficients ω_π and ω_U	1.5, 0	1.5, -0.4	1.5, -0.8	
1) Output loss	34.89%	26.85%	22.42%	34.35%
2) <i>l</i> -unemployment loss	25.34%	16.38%	11.54%	23.89%
3) <i>h</i> -unemployment loss	7.24%	6.60%	6.25%	7.21%
4) Inequality ratio	3.49	2.48	1.84	3.31
5) Cumulative inflation (volatility)	4.24	6.81	12.62	2.42
6) Sacrifice ratio (volatility)	0.13	0.29	0.71	0.08

Result:

To improve inequality, need to accept high inflation volatility

Inclusive Monetary Policy in a Crisis

- **Expansionary monetary policy reduces inequality by raising low-productivity workers employment. At a high cost in inflation and inefficiency.**

Charting the Unknown: Economic challenges in an uncertain macroeconomy

Federico Ravenna

Intesa San Paolo Chair Lecture





Research
Education
Outreach

CCA



Fondazione
Compagnia
di San Paolo



UNIVERSITÀ
DEGLI STUDI
DI TORINO

www.carloalberto.org