Volcker memorial lecture
NABE Spring Conference

Climate Policy is Macro Policy

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- Climate change is macro critical
- One of several major supply shocks
- Climate policy becoming the third pillar of macro policy
- Policy coordination can yield superior outcomes
- Net zero financial sector poised for investment boom
- But we’re caught in a Timidity Trap
- WWVD?
CO\textsuperscript{2} emissions driving global temperature rises, rising sea levels & polar ice loss

Global CO\textsubscript{2} Concentrations highest in 800,000 years

Sea levels risen by 20cm in past century

Global temperatures 1.1°C warmer than pre-industrial levels

Polar ice loss tripled in last decade
...with widespread Impacts

- **Extinction rates** 100 x higher than over past several million years
- **Population** of mammals, birds, fish, reptiles and amphibians fallen by 70% over past 50 years
- By 2100 over a billion people could live under lethal climatic conditions
- Since the 1980s, tripling of extreme weather events causing **eight-fold increase in property destruction**
- Coastal flooding projected to rise by 50% by 2100, threatening assets worth 20-25 per cent of global GDP
Temperature impacts alone could drive a lost decade of growth

Under different RCP forcing scenarios, relative to a no-warming baseline (SSP1). The three vertical black lines denote the 1.5°C target, the 2°C target and the median-estimated warming expected under current Paris commitments (2.9°C).

Source: Burke et al (2018) Large potential reduction in economic damages under UN mitigation targets
Current modelling is partial, underestimating likely effects

Estimates typically only capture impacts from temperature changes, and do not include GDP impacts from:

- Higher frequency and severity of *extreme weather* on property, prices and supply chains
- Losses from *sea level rise and water scarcity*
- Costs of *adaptation*
- Wider societal impacts from *climate migration and conflict*

Moreover, modelling *assumes* monetary and financial stability
Annual investment for net zero transition needs to double to ~$4trn...

- **$4.1trn BCG**: 1.5C scenario, energy investment.
- **$4.4trn IRENA**: 1.5C scenario, energy investment.
- **$3.5trn NGFS**: 1.5C orderly scenario, annual investment to 2050.
- **$3.2-5.1 trn BNEF**: 1.5C net zero scenario, annual investment to 2050, range of technology paths.
- **$4.5trn IEA**: 1.5C net zero scenario, annual investment to 2050, energy related.
- **$1.9trn Goldman**: 1.5C net zero scenario, incremental infrastructure capex, annual to 2050.
- **$9.2trn McKinsey**: Incl. AFOLU and broader view of investment on demand side.

Estimated range: $3.5trn – $4.5trn a year
... bringing significant GDP multipliers

GDP uplift from incremental investment in the net-zero transition (IEA, IMF)

Under IEA net-zero scenario every $1 of Net Zero investment results in over $3 dollars of additional GDP
And offsetting some of the structural changes that have lowered $r^*$

World real interest rate, $R^*$

Global investment

Lower price of capital,
Lower public investment,
Capital-light growth

Global savings

Demographics,
Distribution of income
Debt,
Disaster hedging

Global saving
and investment
Transition investment reverses investment drought, raises $r^*$

- Higher price of capital,
- Higher public investment,
- Capital-intensive growth

![Graph showing the relationship between world real interest rate ($R^*$) and global savings vs. global investment. The graph illustrates how an increase in $r^*$ leads to an increase in global investment, reflecting higher savings and investment.]
Net Zero transition is likely inflationary near-term / deflationary long term

‘Shadow’ carbon pricing creates near-term upward pressure on inflation

Source: NGFS Scenario Explorer using Net Zero 2050 (with REMIND-MAgPIE 2.1-4.2 inputs)
Globalisation has delivered a persistent, positive supply shocks

Positive supply shocks from global integration of product and labour markets

Movements in demand relative to supply

Integration of global value chains, increased competition and contestability of product and labour markets

Excess demand 0 Excess supply
De-globalisation and climate will reverse this trend

Supply side shocks from extreme weather

Resilient supply chains, strategic onshoring, energy transition

Excess demand 0 Excess supply Supply-demand

Inflation
From Divine Coincidence to Tough Trade-offs

Monetary policy trade off:
- Sacrifice ratio = Change in output / Change in inflation
- Preferred combination of inflation and output gap after shock
- Phillips curve, after trade-off inducing inflationary shock
- Policymaker’s preferred equilibrium trade-off

Policy responses:
- Inflationary, with trade-off
- Inflationary, no trade-off
- Philips curve
- Output gap
- Disinflationary, no trade-off
- Disinflationary, with trade-off
US and Euro area haven’t had to grapple with this shift...until now

Pre-covid, the US continued to experience predominantly demand shocks ...

...as did the Euro area
UK policymaking challenged by supply side shocks since Global Financial Crisis

During the great moderation period, demand shocks dominated in Divine Coincidence....

...whereas after the financial crisis, the UK economy experienced a series of challenging monetary trade-offs

Source: Bank of England
Net-zero transition accelerating

**Countries with net-zero commitments**

- **Jan 2020**: 21
- **Nov 2021**: 140
- **Increase**: 7x

**Emissions covered by country net-zero commitments**

- **Jan 2020**: 30%
- **Nov 2021**: 90%
- **Increase**: 3x

**Companies with net-zero commitments**

- **Jan 2020**: 992
- **Nov 2021**: 5,230
- **Increase**: 5x

**Financial commitments to net zero**

- **Jan 2020**: $5T
- **Nov 2021**: $130T
- **Increase**: 26x

Global emissions covered by net zero targets rising but action still lagging

Global temp increase by 2100

+0°C
+1.5°C
+2°C
+3°C
+4°C

Policies & action

2030 targets only

+0°C
+1.9°C
+2.0°C
+2.4°C
+3.0°C
+3.6°C

Pledges & targets

Optimistic scenario

+1.7°C
+2.1°C
+2.6°C
+2.4°C
+1.8°C
+1.5°C

1.5°C PARIS AGREEMENT GOAL
WE ARE HERE: 1.2°C
PRE-INDUSTRIAL AVERAGE
Credible & predictable climate policy will amplify & accelerate investment

Governments enact credible climate policies

- Amplifies effectiveness of climate policies, accelerates transition, promotes jobs and growth
- Provides certainty for investment
- Encourages companies to develop Net Zero transition plans

Funds initiatives and innovations of private sector
Credible climate policy catalyses the financial sector to finance emissions reduction, driving stronger and smoother macro-economic outcomes.

*Credible policy frameworks can reduce the carbon prices necessary to achieve a given goal.*
Core elements supporting transition in mainstream markets

- Mandatory Climate disclosure (SEC & ISSB)
- Climate stress testing
- Net Zero transition plans
- Portfolio alignment
- Frameworks to phase out stranded assets
40% of the world’s financial assets are now pledged to net zero

$100 TRILLION
FINANCE NEED FOR NET ZERO THROUGH 2050

$130 TRILLION
FINANCE COMMITTED TO NET ZERO THROUGH GFANZ

Note: Glasgow Financial Alliance for Net Zero (GFANZ).
Lower emitting companies across industries trade at premiums

Source: Refinitiv, FactSet, Bloomberg, Goldman Sachs Global Investment Research
Net Zero Transition improves Energy Security

Energy security

Sustainable Energy = Energy Security

Energy sustainability
Escaping the Timidity Trap:
Climate change is a Choice