

# On the economic foundations of green growth discourses

## The case of climate mitigation policies

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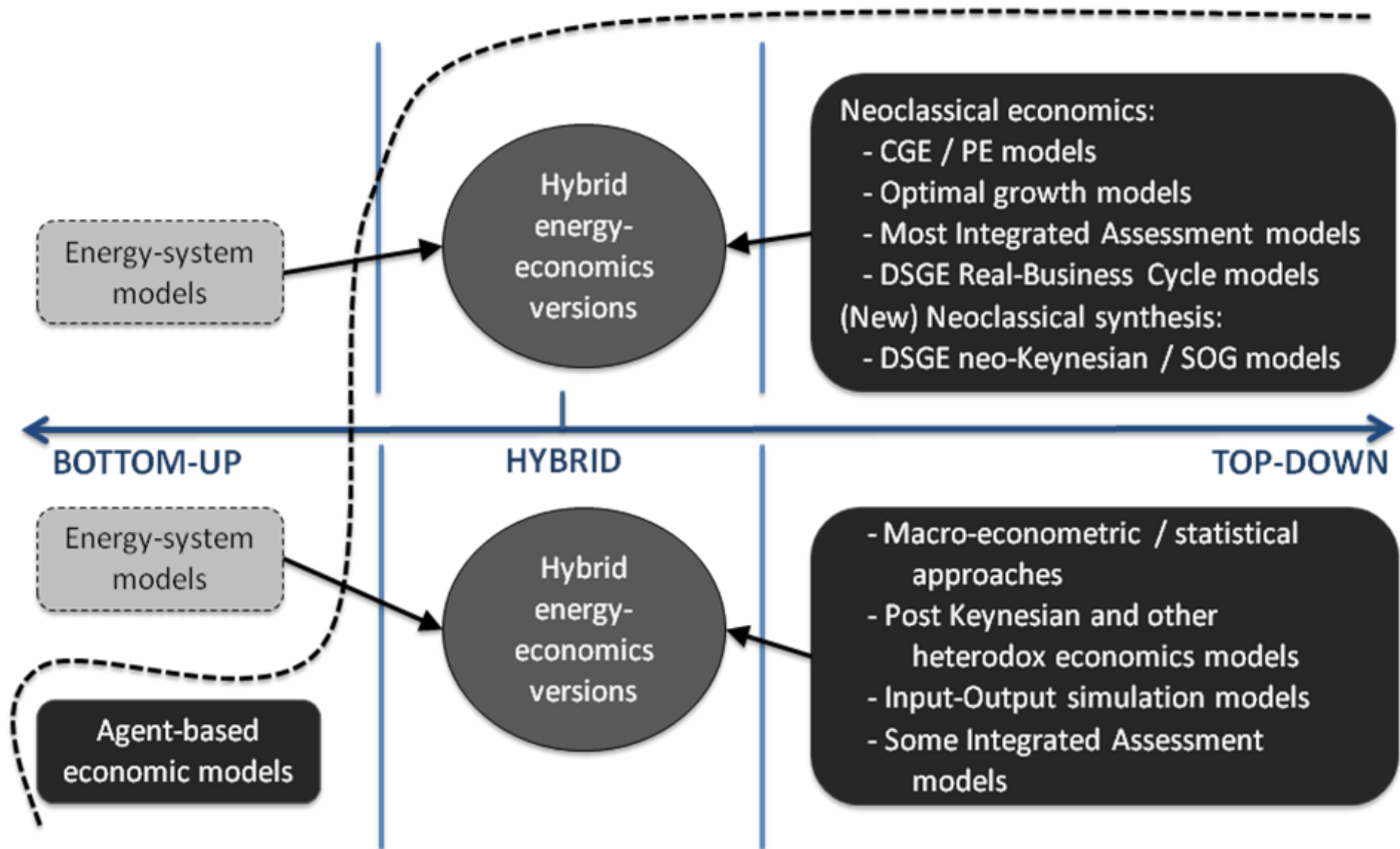
Hypothesis discussed: Growth of modern economies may be sustained or even augmented, whilst policy intervention ensures sustained environmental stewardship and better social outcomes

- OECD definition of green growth (2012):  
“Growth that allows natural assets to continue to provide the resources and environmental services on which well-being relies”
- UNEP definition of green economy (2011):  
“An economy that results in improved human well-being and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities”
- Exploring the economic foundations of such claims
- While more recognition is given to policy intervention, the role of macroeconomic policies are ambiguous and sidelined

- Orthodox economists have rejected environmental limits to continuous growth and ever-growing consumption
- Ecological economists and other non-orthodox economists have been stressing the importance of environmental constraints and physical limits to economic growth
- The emergence of the **man-made climate change problem** is putting to test these opposing views and poses challenging constraints on macroeconomic growth
- **Green growth** aims at a **compromise** between these two opposing views and reconciliation between environmental sustainability and perpetual economic growth

- The taxonomy proposed follows two criteria:
  1. The economic theoretical underpinnings and model solution approach: **optimisation versus simulation**
  2. The representation of (energy) technologies: **bottom-up, hybrid, and top-down**
- Optimisation models: employ mathematical optimisation techniques to economic analysis, and have taken, predominantly, the form of CGE models, (exogenous or endogenous) optimal growth (OG) models or a combination of these
- Simulation models: do not optimise a particular objective function, but describe a number of interlinked energy-emissions-economic relationships that allow for exploring the propagation of perturbations to the system

# O P T I M I S A T I O N

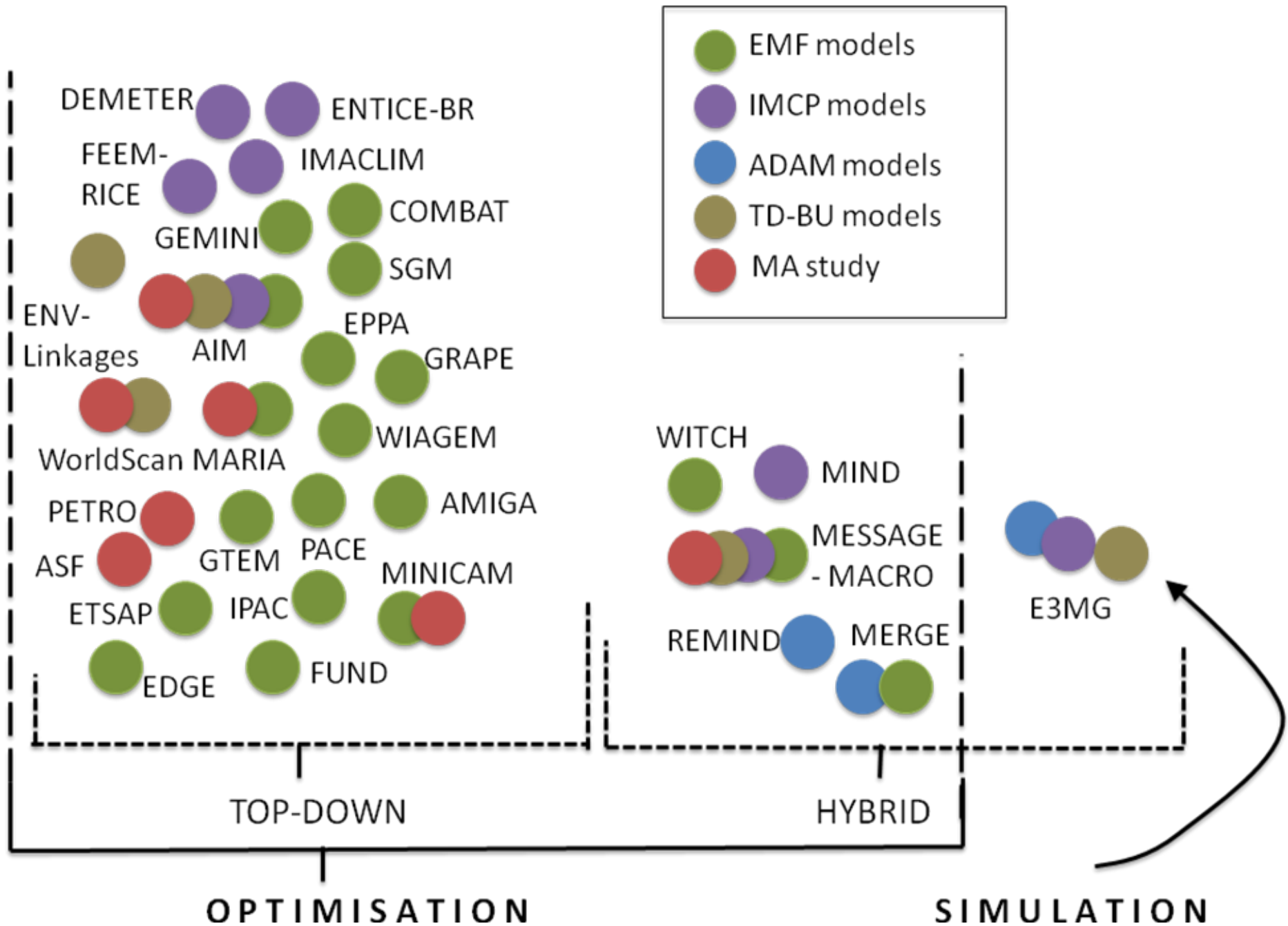


# S I M U L A T I O N

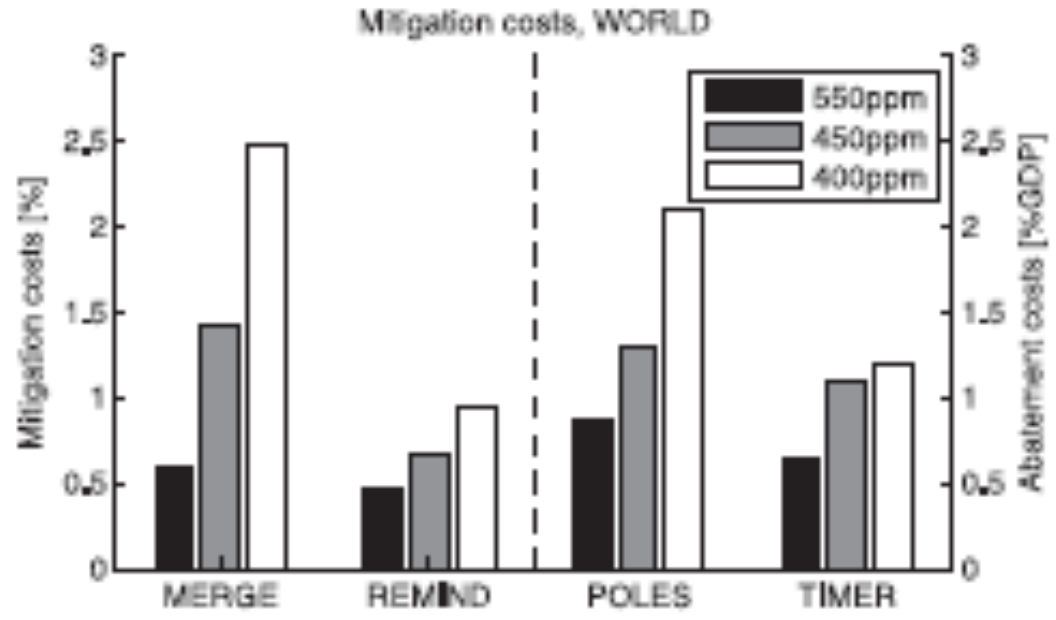
- Conventional computable general equilibrium and optimal growth modelling dominates the climate economics literature

These can be characterised by the assumptions that:

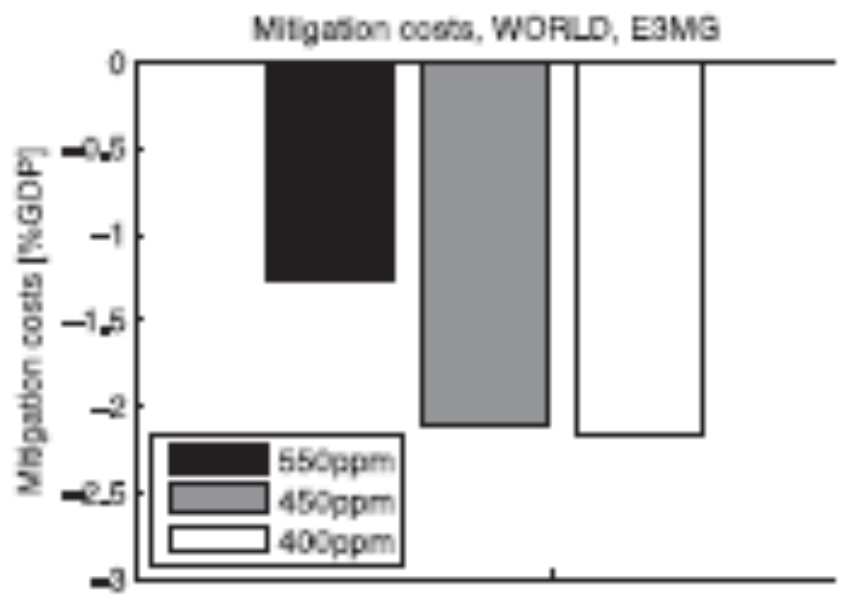
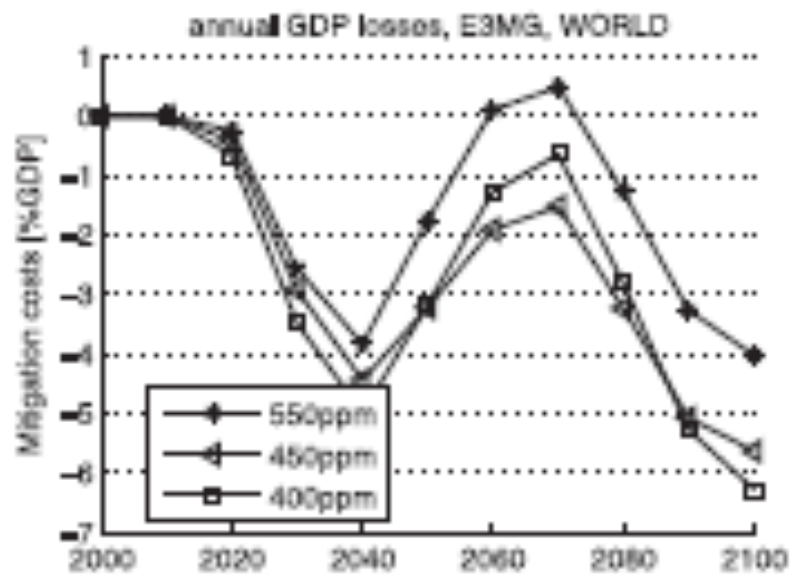
- Prices clear to ensure the full employment of resources
- Markets also ensure the achievement of the first best solution
- People act as perfectly rational with a perfect power of processing information
- Obstacles like biophysical limits or scarce resources are always foreseen and wisely circumnavigated







Source: Edenhofer et al  
*Special Issue of the  
 Energy Journal 31/2010*



- Despite some progress, the inherent restrictive assumptions of optimisation models on socioeconomic behaviour typically project a by-default cost to the economy from climate mitigation action
- The space for policy intervention is reduced to market-based instruments (linked to the neoliberal laissez-faire take on the role of policy vis-à-vis “well-behaved” markets)
- Dominant climate economic thinking in the form of orthodox economic equilibrium and optimisation modelling offers, in effect, little support to green growth claims.

Key differences	Orthodox optimisation economic modelling	Alternative simulation economic modelling
Market equilibrium	Economies are in equilibrium, markets always clear via long run competitive pricing.	Markets do not necessarily clear. Economic systems evolve and are under continuous perturbations. Markets are not self-equilibrating in the short or long run.
View of the macro-world	First-best world with optimal utilisation and full employment of resources.	Second-best world with sub-optimal utilisation of resources. Allows for under-employment, (involuntary) unemployment and socially-determined income distribution
View of the micro-world	Representative economic agents, fully rational and often with perfect foresight	Heterogeneous agents with bounded rationality and limited foresight, tackling the limitations to aggregation.
Empiricism	Predominantly deterministic with little empirical validation.	Can be empirically validated and grounded in observed behaviour.
Uncertainty	Well-behaved and self-stabilising markets; the use of certainty equivalents	Market instability / volatility, fundamental uncertainty
Technological change	Limited endogeneity; belief in markets self-delivering (environmental) technologies	More comprehensive endogeneity; policy-induced technological change

Key differences	Orthodox optimisation economic modelling	Alternative simulation economic modelling
Economic growth	By and large supply driven with economies structured around production functions	Also draws attention to demand-driven output and employment (e.g. Keynesian based)
Macroeconomic policy	Government intervention is generally seen as adding distortions to the economy and is reduced to market-based instruments (e.g. carbon pricing).	More room is given to policy intervention, and the importance of both fiscal and monetary policies in shaping “greener” growth pathways.
Institutions	Reduced to ensuring conventional (neoliberal) “macroeconomic stability” ; the use of logical time	Institutions are given wider scope and role in shaping development pathways; the use of historical time and institutional path dependency
Green growth potential	Typically do not support the green growth hypothesis, as policy interventions for environmental stewardship and social cohesion are seen as negatively affecting growth (e.g. slower growth from mitigation).	Can provide support to the green growth hypothesis. Climate mitigation action may benefit the economy and is not necessarily seen as a costly constraint (also depending on how baselines are captured)

## *Concluding remarks*

The possibility of “green growth” or of a “green economy” remains yet to be established.

New thinking on economic behaviour, dynamics, complexity, and social relations is called upon.

The progress of the economics discipline appears to be painfully slow and fast losing its touch with reality.

# Proposed way forward

- 1) Non-optimisation, non-equilibrium modelling and empirical validation
- 2) Demand-driven economic growth (e.g. more akin to Keynesian or post-Keynesian economic thinking)
- 3) Endogenous and induced technological change
- 4) The role of macroeconomic policy and institutions in shaping development pathways (short-term and long-term)

# Proposed way forward

- 5) Linking the money with the real markets; linking monetary with fiscal policy
- 6) Dealing with uncertainty and market instability
- 7) Rethinking the links between micro and macroeconomic behaviour, and the limitations of aggregation
- 8) Addressing both scale-issues and beyond growth impacts (inter-disciplinary approaches)

Thank you for listening

Questions please