

Comments on Dafermos, Nikolaïdi and Galanis: “Climate change, financial stability and monetary policy”

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Outline of remarks

- What's the paper about?
- Critique
- Brief comments on the authors' theme

What's the paper about?

- **Novel integrated assessment model**
 - **Emphasis on stock-flow consistency for material balances and energy.**
 - **Includes: bank lending subject to credit rationing, bond market, central banking, government sector, household portfolio choice and an endogenous rate of default for firms.**

What's the paper about?

- **Novel integrated assessment model**
 - Weitzman damages function allowing for the possibility of catastrophe.
 - Learning by doing for:
 - Reduction in energy intensity.
 - Increase in share of green capital.
 - Leontief production function.

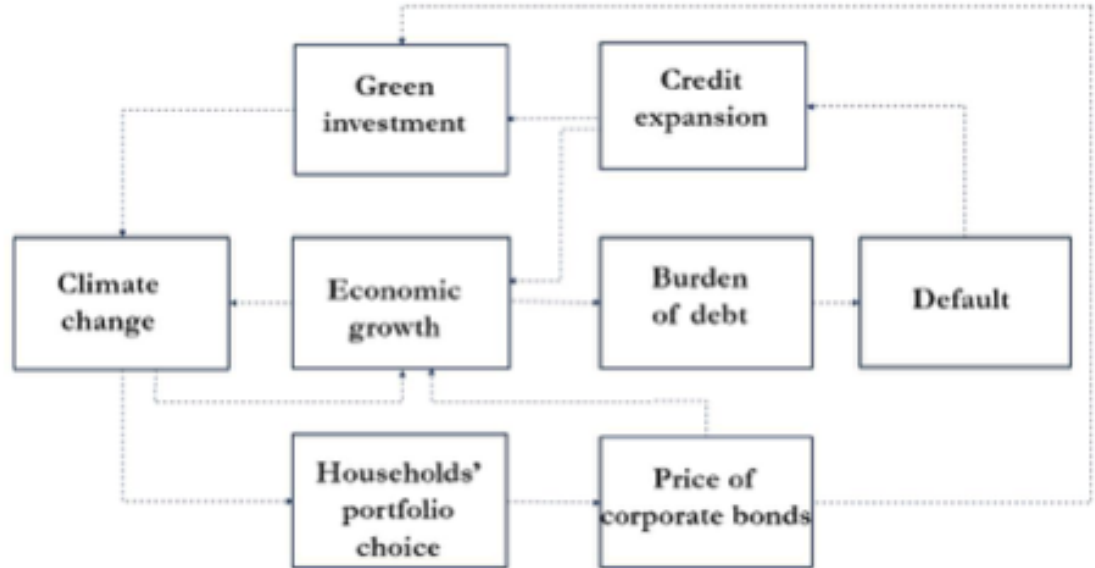
What's the paper about?

- **Projections 2015-2115**
 - Recursive structure allows relatively simple simulation
 - Abstracts from business cycles.
 - Baseline 'business as usual' scenario and two sensitivity tests; then 'green QE' experiment.
 - Auto- and cross-correlation structure of simulated data checked against historical data patterns.
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What's the paper about?

- **Draws out links between climate change and financial stability (corporate defaults and prices of green and regular corporate bonds)**

Fig. 2: Channels through which climate change and financial stability interact in the model



What's the paper about?

- **Main results**

- **BAU leads to temperature increase $> 4^{\circ}\text{C}$ despite spread of green technology.**
- **Climate change slows growth, raises default rate, reduces profitability, inhibits green investment.**
- **Green QE increases investment, the share of green investment and financial stability – but is no panacea.**

Critique

“Climate change policy: what do the models tell us?”

“Very little... IAM-based analyses of climate policy create a perception of knowledge and precision, but that perception is illusory and misleading.”

Pindyck, R.S., (2013), JEL 51(3), pp. 860-872.

Critique

- **Good aspects include:**
 - Focus on the implications of climate damages.
 - Stock-flow consistency.
 - Explicit treatment of financial portfolios and financial stability
 - Explicit credit channel affecting the level of activity.
 - Inclusion of learning by doing, no 'bang-bang' technology switching.
 - (Heterodox approach to growth modelling.)

Critique

- **Less good aspects include:**
 - Recursive structure – extreme ‘tragedy of the horizon.’
 - Lack of industry structure.
 - Some mitigation built into BAU.
 - Stacks the deck in favour of QE?
 - Hazy on other policy tools.

Critique

- **Less good aspects include:**
 - (Parameterisation – “Selected from a reasonable range of values”, etc. - not econometric.)
 - (Lack of micro foundations - vulnerability to the Lucas critique.)
 - (Characterisation of production technology.)
 - Treatment of risk and financial instability.

Current VaR to global financial assets from climate change between 2015 and 2100

Emissions scenario	1 st pctl.	5th	Mean	95th	99th
BAU (expected warming of 2.5°C in 2100)	0.46%	0.54%	1.77%	4.76%	16.86%
Mitigation to limit warming to 2.0°C in 2100 with 2/3 probability	0.35%	0.41%	1.18%	2.92%	9.17%

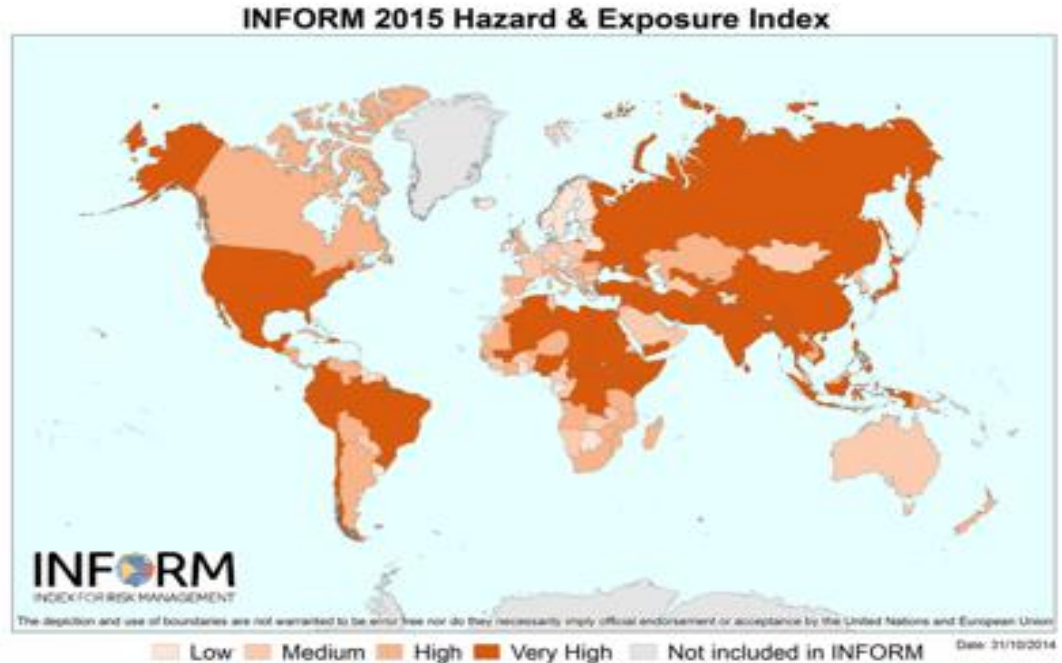
Source: Dietz et al. (2016), Nature Climate Change, online 4 April, DOI: 10.1038/NCLIMATE2972

- Derived by using an ‘integrated assessment model’ linking climate and growth models.

Comments on the authors' theme

- Uncertainty of pay-offs to new technologies.
- Managers of financial institutions may give too low a weight to types of risk unmonitored by their supervisors.
- Knightian uncertainty about climate damages; sudden-onset disasters and global-scale tipping points; socially contingent costs (e.g. Syria?)
- Unequal distribution of impacts.

Geographic inequality of hazards and exposures



Source: <http://www.inform-index.org>

Impacts of climate change at the level of asset classes

- Little academic work available that quantifies the impacts of climate change on individual asset classes, let alone at a more granular level.
- Industry research by Mercer (2015): climate change might pose risks to the performance of specific asset classes such as commodities (agriculture and timber), real estate and emerging market equities.