The financial crisis and the 2°C target: Evidence so far and a possible global policy response

Achieving 2°C climate stabilisation: macroeconomic benefits or costs?

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Emissions and the Crisis

- Introduction and methodology
- Impacts of the recession
- Looking forwards
Summary: Crisis and Recession

- The financial crisis started in the US housing market
- It quickly spread to other financial markets globally
- Global panic led to a collapse in investment
- International trade was severely affected
- GDP growth slowed and almost all developed countries entered recession
Summary: Crisis and Recession (cont.)

- Initially governments provided support through stimulus packages
- This was quite short-lived in nature and was replaced in many countries with austerity
- Current prospects for growth remain mixed across global regions
Commodity and ETS Prices

• The recession caused a fall in commodity prices but prices have generally rebounded
  – there are both supply and demand factors in this
  – some of the recent increases could be due to QE

• There are lasting and negative effects on the EU ETS price; this may hold back other countries in developing carbon pricing
How did the financial crisis affect emissions?

Finance

Real Economy → Energy Demand → Emissions
Decomposition of Energy Emissions

Four Components:

\[ EnEM = POP \times \frac{GDP}{POP} \times \frac{Energy}{GDP} \times \frac{Emissions}{Energy} \]

- Population
- GDP per capita
- Energy intensity
- Carbon intensity
Other ways of splitting…

- By sector – Energy and carbon intensities could vary according to sectoral effects
- By geographical area - Intensities vary by country, particularly relating to electricity generation
Key Questions

• What did the financial crisis do to each of these four components?
• What are the lasting effects?
• To what extent can the negative effects be addressed by policy?
Population in the crisis

Annual change in global population (%), 2001-2011

Source: World Bank
GDP per capita in the crisis

Annual change in global GDP per capita (%), 2001-2011

% change in GDP per capita growth

Source: World Bank
Which sectors were affected?

• There is a clear order to how the sectors were affected by the financial crisis:
  – finance
  – sectors supporting finance
  – sectors relying on finance (e.g. manufacturing) and exposed to loss of confidence (e.g. construction)
  – consumer services
  – government sectors
Economic Output

Annual change in global economic output by sector (%), 2001-2011

% change

Source: UN
Energy Intensity

- Change in energy intensity can be broken down to:
  - change in sectoral composition
  - energy intensity in any individual sector
- Ideally, changes in energy prices could be separated as well
Energy Intensity

Annual change in global energy intensity (%), 2001-2011

Carbon Intensity

- Carbon intensity is a direct function of the energy mix
  - in particular the share of coal in total primary energy consumption
  - e.g. Chinese use of coal could increase intensity, growing use of shale gas could reduce it
Carbon Intensity

Annual change in carbon intensity of global energy use (%), 2001-2011

% change

Year

What would have happened if… ?

- … there had not been a recession?
- Evidence here suggests emissions would be higher in line with GDP?
The Role of Policy

• In the immediate aftermath of the crisis, there was active policy to:
  – increase GDP
  – reduce energy intensity
  – reduce carbon intensity
‘Green’ Recovery Plans

• A study in 2011 found that:
  – European countries allocated €18bn out of total stimulus packages of €150bn to green measures
  – some other countries (e.g. China, Korea) had much larger packages
  – the short-term economic benefits of investment schemes matched the short-term benefits of other types of investment, if projects were identified
  – energy efficiency (and renewables) could have longer-term benefits from reduced fossil fuel imports
  – there was sometimes a trade-off between immediate benefits (investment) and long-term benefits (research)

More Recent Policy

• Current policy is less clear cut (and varied), but it could be argued that it:
  – reduces GDP (austerity)
  – reduces energy intensity (efficiency programmes)
  – is neutral on carbon intensity (renewables subsidies cut but use of feed-in tariffs growing; EUA close to zero)
Could austerity help?

- Recent analysis in Europe has shown that revisions to energy taxes could reduce government deficits at a lower cost than alternative measures.
- In the US, a larger domestic energy sector suggests costs would be higher, but still similar to alternative approaches.

Conclusions: Lasting Effects

• It is often said that the recession ‘bought time’ but without reform, previous trends will resume
• Possibly it is too early to judge, as western economies are still emerging from recession; this remains the policy priority
• But this analysis does not provide evidence to suggest otherwise
Conclusions: Lasting Effects

• Limitations in access to finance for both R&D and new equipment are a concern – messages are quite mixed
• How much could progress be driven by the developing world?
• Is a global response possible?
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