Disaster Risk and Preference Shifts in a New Keynesian Model

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T2M Conference
March 25, 2016

[1]The views expressed here are solely those of the author and should not be taken to represent those of the Bank of England.

This paper: motivation

- Gourio (2012) shows that a spike in the probability of 'disaster' in an RBC model
  - Generates a recession
  - Matches well data on quantities, asset prices, and risk premia

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- Two issues
  1. Baseline version of the model cannot generate comovement between consumption and investment
  2. Non-conventional (large) values of intertemporal substitution (EIS). When using smaller values for EIS, an increase in disaster risk leads to a boom

This paper: Questions & Answers

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- How to address the comovement problem?

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Answer

- Introduce time-varying disaster risk à la Gourio (2012) in a New Keynesian model

This paper: contribution

- Shed light on the role of the EIS in the disaster risk literature
  - Show that an increase in disaster risk leads to a boom for values of EIS below unity
    [Already in Gourio (2012, 2013)]

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- Introduce time-varying disaster risk probability in a NK framework
  - Show that sticky prices and *large* EIS can generate a recession, good match with financial data, and consumption/investment comovement
    [New!]

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- Model matches many important asset pricing facts, but...
  - All results reverse if you assume IES¡1
  - Lack of comovement between consumption and investment (and hours, output, etc)

Introducing sticky prices

- Gourio addresses the lack of comovement introducing countercyclical markups [Hall, 2011]
  - Other proposed solutions
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  - But output now is demand determined
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- Proposed solution: assume IES¡1

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- Mechanism is very neat, but how about the performance of the model?
  - Business cycle moments
  - Risk premia and volatility of returns
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- Mechanism is very neat, but how about the performance of the model?
  - Business cycle moments
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  - P-D ratios
- How crucial are Epstein-Zin preferences? Can you get back to a CES/CRRA world?
- What is the role of monetary policy rule in getting comovement right?
  - Sensitivity on the coefficients on inflation and output

Questions & Comments (cont'd)

- Model is solved with (third order) perturbation methods
- Recent paper by Fernandez-Villaverde and Levintal (2016) compares different solution methods for models with rare disasters
  - Perturbation methods might be not accurate, unless one goes for very high orders

Table 4: Disaster Models - Mean Euler Errors (log10) across the ergodic set

Model	state vars	Perturbation					Taylor Projection		
		1st	2nd	3rd	4th	5th	1st	2nd	3rd
1. Benchmark with EZ and disasters	4	-1.7	-2.0	-2.4	-2.9	-3.5	-3.1	-5.3	-6.9
2. + capital adjustment costs	5	-1.6	-2.0	-2.4	-2.8	-3.2	-2.5	-4.1	-5.4
3. + Calvo	7	-1.7	-2.0	-1.8	-1.7	-1.9	-2.4	-3.8	-4.8
4. + Taylor rule depends on output growth	8	-1.8	-2.1	-2.1	-2.0	-2.2	-2.5	-4.0	-5.1
5. + Taylor rule is smoothed	9	-1.7	-2.1	-2.1	-2.1	-2.2	-2.2	-3.7	-4.5
6. + investment shock	10	-1.8	-2.1	-2.1	-2.1	-2.2	-2.3	-3.7	-4.5
7. + monetary shock	11	-1.8	-2.2	-2.1	-2.1	-2.2	-2.2	-3.6	-4.5
8. + intertemporal preference shock	12	-1.7	-2.1	-2.1	-2.1	-2.2	-2.2	-3.6	-4.4

Summing up: simple idea with important implications!

- Could reconcile macro/finance real business cycle literatures
  - but more work to be done
- Better understanding of a (potentially) important driver of business cycles
- Model can be used for policy analysis