



Centre for Risk Studies Research Showcase 13 January 2015
Session 2: Catastronomics

Macroeconomic Modelling Methodology: Global Property Crash

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Methodology Overview

- Preliminary Research
- Modelling Instruments
- Macroeconomic Analysis
- Outputs for Financial Impact Assessment

Case study: Global Property Crash Catastrophe

Preliminary Research

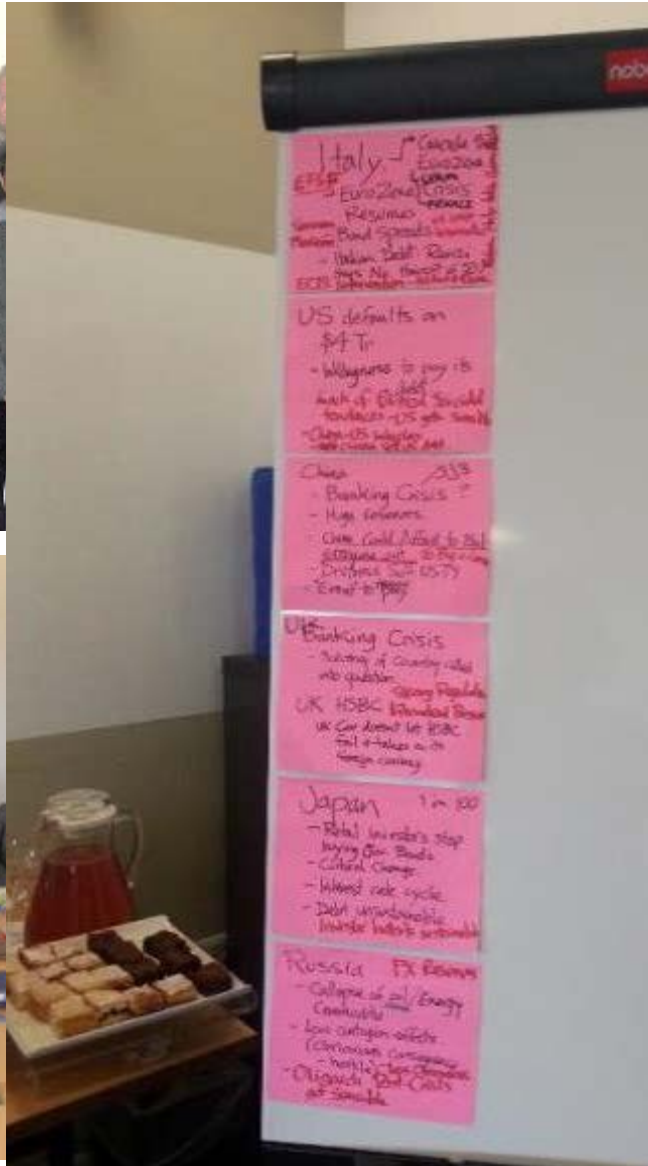
■ Background and context:

- Value of global financial assets US\$260tn (2014)
- Predicted to grow 40% to \$370tn (2020)
- Total losses accrued during the GFC summed at \$50tn; equalled total annual gross world output (2008) or 20% the global financial assets today

■ Workshops and/or brainstorming sessions

- Financial Catastrophe Development Workshop 10th July 2014
- Members from industries and academic experts from relevant fields
- Quantification of scenario narrative

Financial Catastrophe Development Workshop



Preliminary Research

- Case Study (1990 Japan Asset Bubble Collapse)
 - Real GDP growth rate fell to 1% from 5%
 - Share price index fell 13 to 26% for three consecutive years
 - Unemployment soared from less than 2% to 21% for the next decade

Macroeconomic Modelling Instruments

- **Input-Output (IO) Analysis**
 - Effects of different sectors on the economy
 - National IO tables
 - World IO Database
- **Oxford Economics (Global Economic Model)**
 - Effects of range of economic topics on the economy
 - E.g. Impact on global growth of oil-price spikes, the economic and financial fallout of countries leaving the Eurozone, decline in China's growth, etc
 - Embedded database updated monthly for 5, 10 and 25-year forecasts

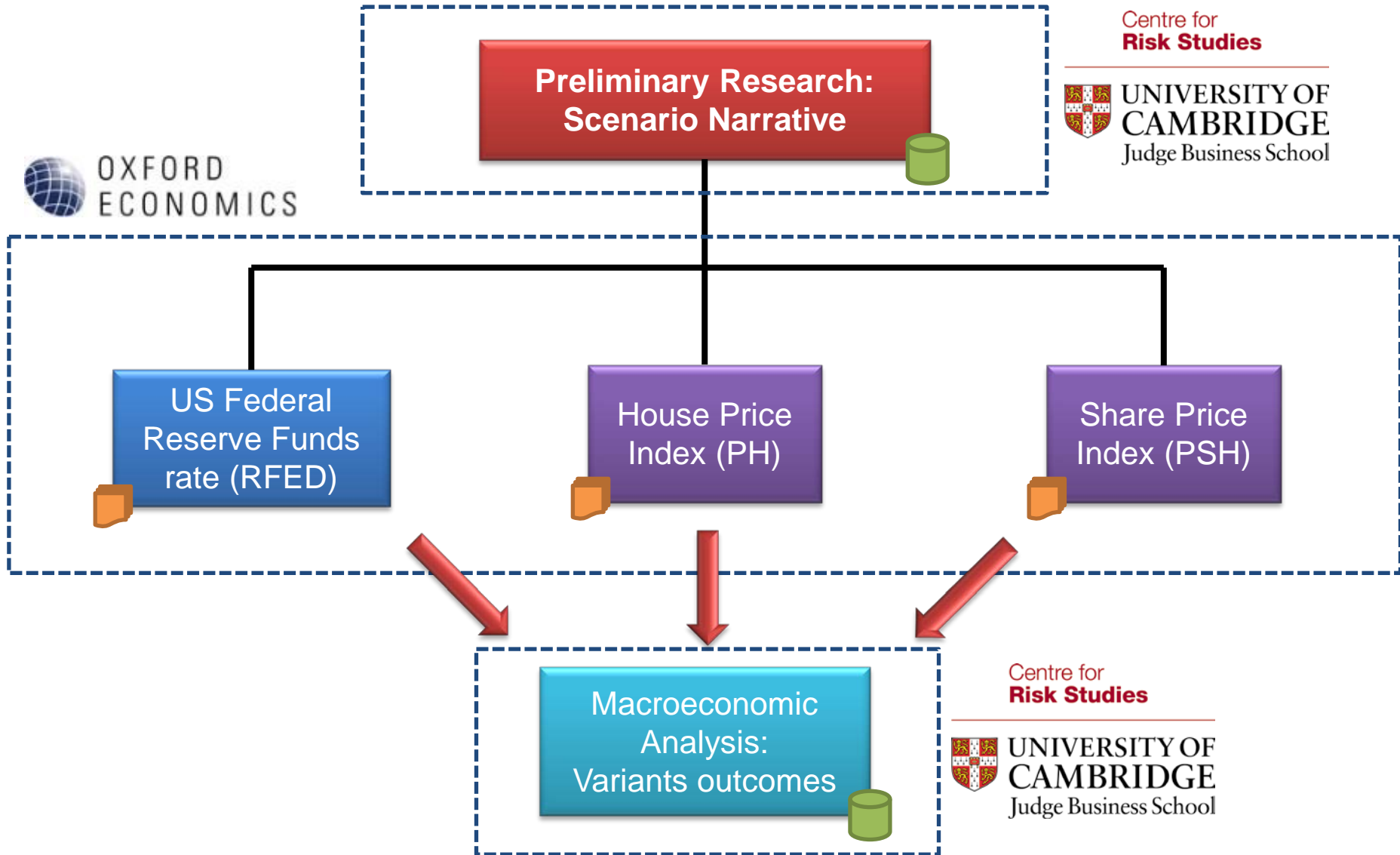
Modelling Instrument: Oxford Economics

- User friendly and relatively easy on application
- Widely used by commerce (IMF, ADB, World Bank, etc.)
- Covers 47 economies in detail
- Eclectic model in equilibrium: Keynesian (short-run) and Monetarist (long-term)
- Monetary policy endogenised through “Taylor Rule”

Macroeconomic Narrative and Analysis

- Trigger: QE tapering policy raises Federal Reserve Fund Rates (RFED) and indirectly affects short-term interest rates (RSH) in the US
- Market reactions: Attracts massive investments into the US and capital away from emerging economies with artificially inflated housing markets
- Model input variables: Causes correction shocks to mortgage (PH) and non-mortgage (PSH) asset prices
- Macroeconomics outcome: Fall in consumer and business confidence resulting from the financial instability, leading to sustained fall in aggregate demand and finally global recession (GDP @Risk)

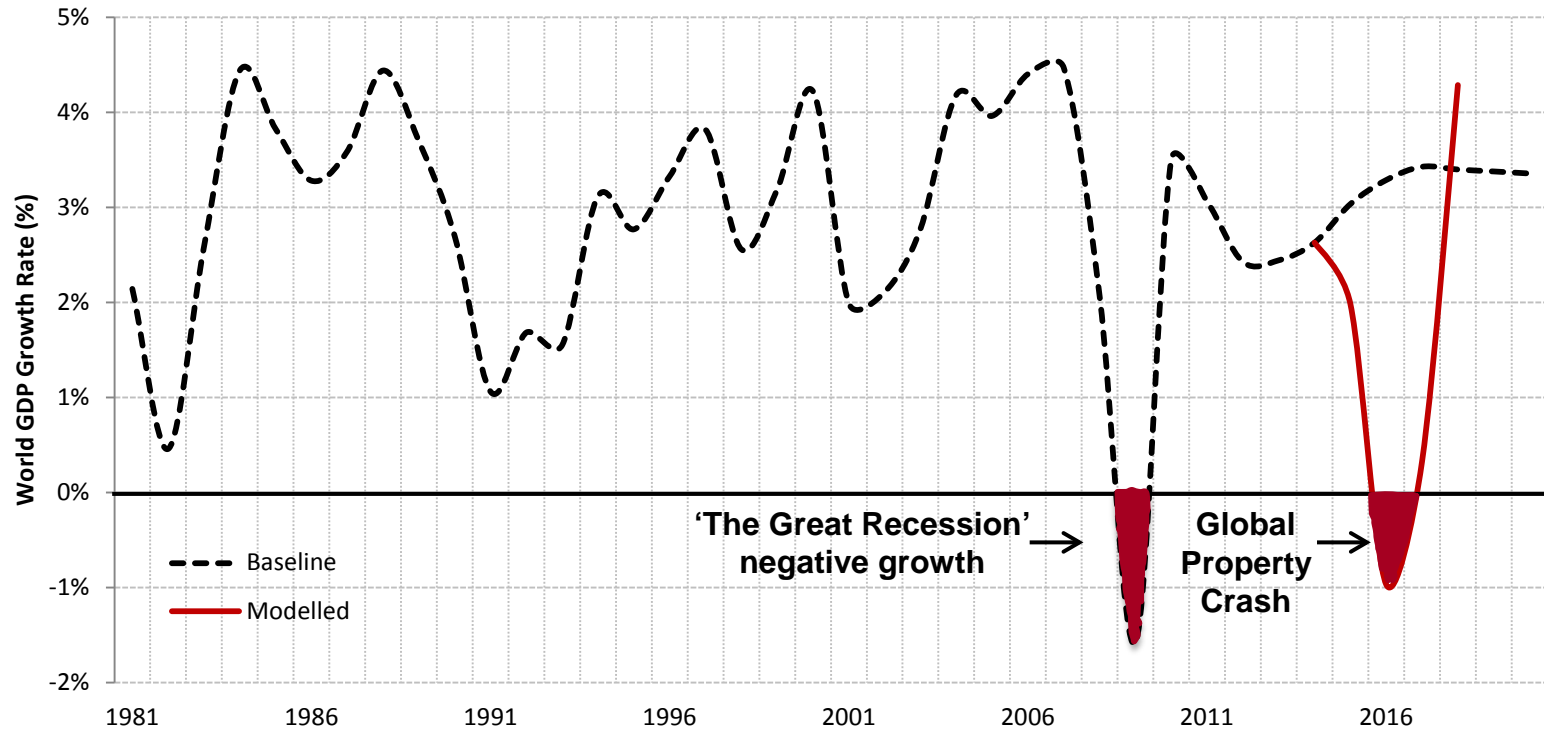
Macroeconomic Modelling Structure



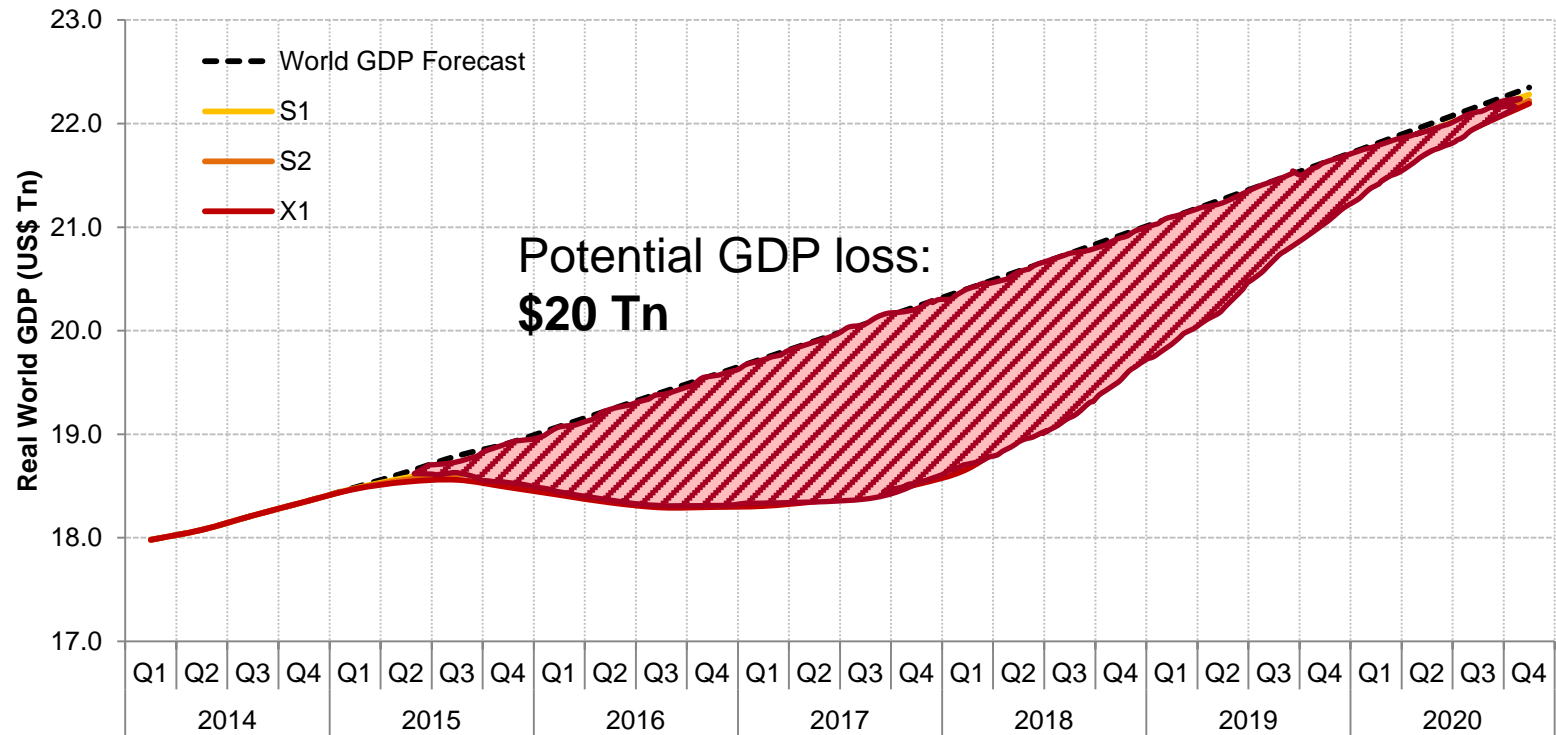
Modelling Variables Summary

Variables		S1 (Standard Scenario)	S2 (Variant Scenario)	X1 (Extreme Scenario)
Inputs	Federal Funds Rate	+6%	+8%	+10%
	Affected Property Markets	Tiers 1 – 6	Tiers 1 – 9	Tiers 1 – 9
	House Price Index	20 – 30%	10 – 40%	15 – 60 %
Outputs	Growth rate	0.8%	-0.3%	-1.4%
	GDP@Risk	\$9 Tn (2%)	\$14 Tn (4%)	\$20 Tn (5%)

World GDP Growth Rate (X1 variant)



Global GDP @Risk



2008 GFC total losses Comparison

- Total financial assets: \$16 Tn
- Real estate stock value: \$30 Tn

Macroeconomic Impact Summary

Catastrophe	Global Property Crash (X1 variant)			
Region	World	China	United Kingdom	United States
Range of GDP@Risk (US\$ trillion)	20	2	1	7
Maximum GDP@Risk (%)	5%	4%	7%	8%
Minimum GDP growth rate (Baseline)	-1.5% (3%)	+1% (6.5%)	-3.5% (2.%)	-5.5% (3%)
Worst recession period	5 Qtrs	N/A	8 Qtrs	8 Qtrs

Macroeconomic Outputs as Financial Inputs

Global Property Crash	Baseline	S1	S2	X1
Equities – Wilshire 5000 Price Index (% change)				
6 months	3%	-6%	-11%	-16%
1 year	5%	-15%	-24%	-33%
Equities – Wilshire 5000 Price Index (% change)				
6 months	3%	-6%	-11%	-16%
1 year	5%	-15%	-24%	-33%
5 year	23%	8%	-19%	-32%
10-Yr Treasury Note Yield (%)				
6 months	0.3	2.3	3.0	3.7
1 year	0.7	5.2	6.9	8.6
5 year	1.8	2.0	0.8	-0.9
Credit Spreads (%)				
6 months	0.0	0.3	0.4	0.5
1 year	0.2	0.5	0.7	1.0
5 year	0.6	0.5	0.5	0.3
Inflation (%)				
6 months	-0.0	-0.1	-0.2	-0.2
1 year	0.1	-0.3	-0.4	-0.5
5 year	0.2	-1.9	-3.2	-4.6

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