



8 December 2015

## Market Risk: Understanding and Managing Tail Events

# Scenario 4: High Inflation World

Centre for  
**Risk Studies**

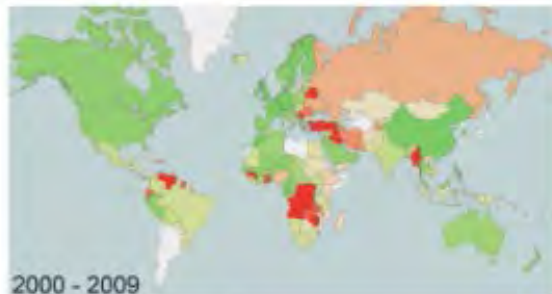


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Centre for Risk Studies



# Global Inflation Rates History



Inflation, period average  
consumer prices (annual %)

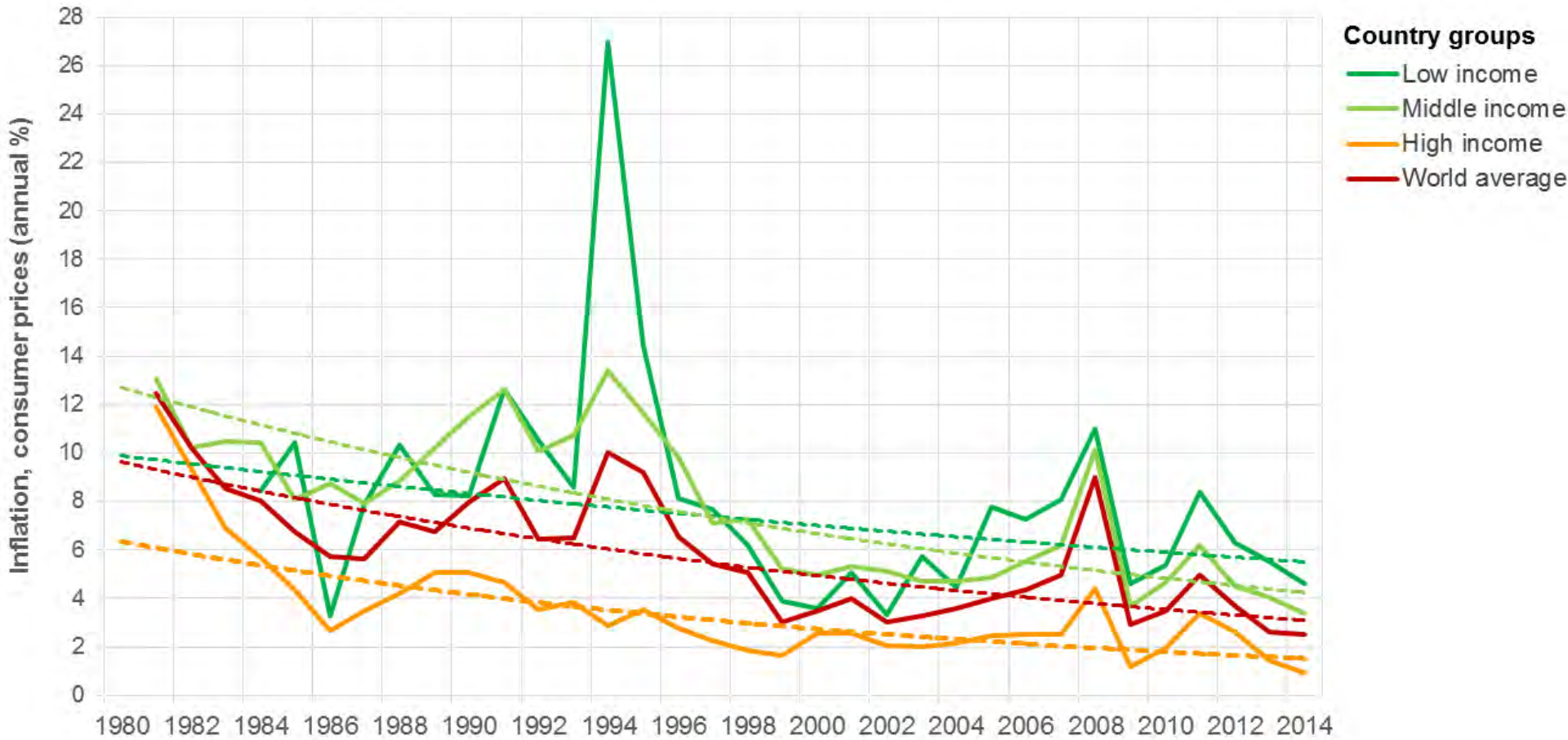


0% 10% >20%

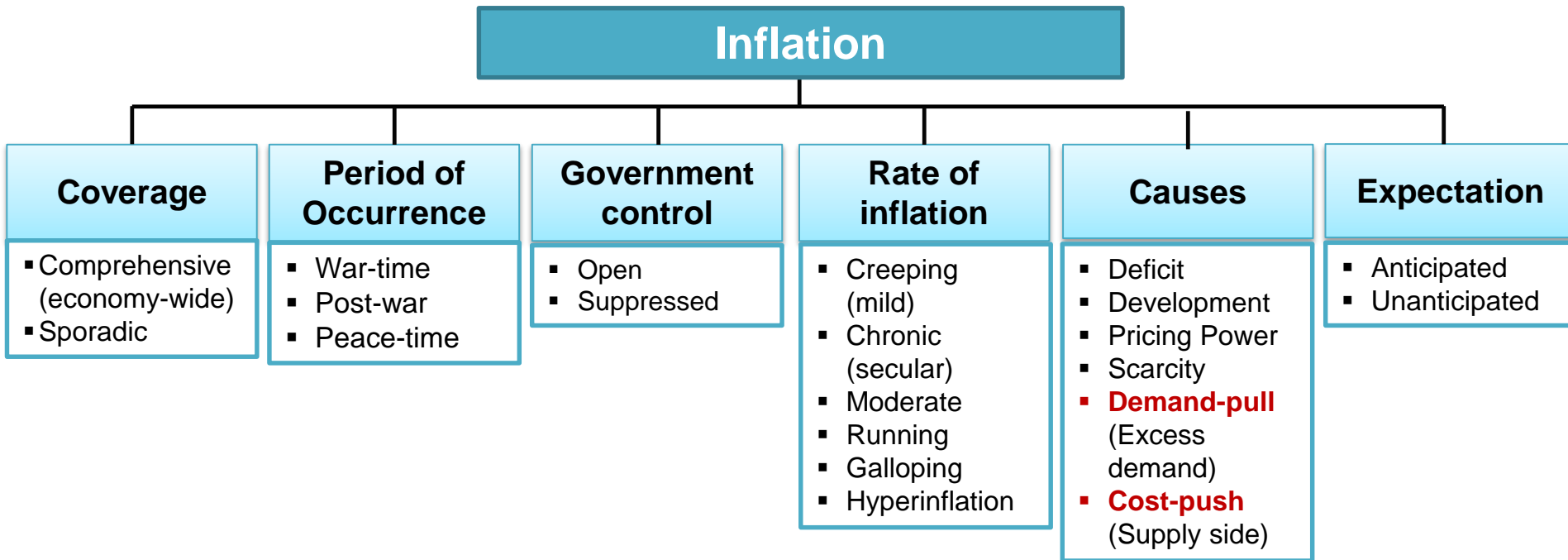
Images made using data from World Bank  
source: <http://data.worldbank.org/>



# High Inflation World



# Types of Inflation



# How our Scenario plays out



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## Rising urban populations threaten worldwide food security

Global warming and increasing populations means that for are only going to get worse

Saturday, November 13

NEW YORK, NY (1322 EST) - A new paper from the FAO examines the new risks to food supply as population growth spikes in developing cities

Drought, crop blight, water shortages and sky-high bread prices all contributed to the social unrest seen in the Middle East and North Africa last year, but experts suggest the situation is unlikely to improve anytime soon.

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## Bee decline is "cataclysmic" event

After a period of extreme weather worldwide, apiculturists say the loss in hive populations is "irrecoverable"

Wednesday, February 5

SACRAMENTO, CA (1431 EST)



Between 80-90% of fruit, nut, seed vegetable crops rely heavily on wild and commercial bees

demand for wind-pollinated

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## Cost-cutting measures rolled out in third week of Hormuz conflict

After 23 days of air strikes off the coast of Oman, farmers at home are beginning to feel the squeeze

Monday, March 19th

WASHINGTON, DC (0944 EST) - The rising price of gasoline has pushed farmers into new territory, forcing unions to explore cost-saving measures to maintain crop prices and consumer bases

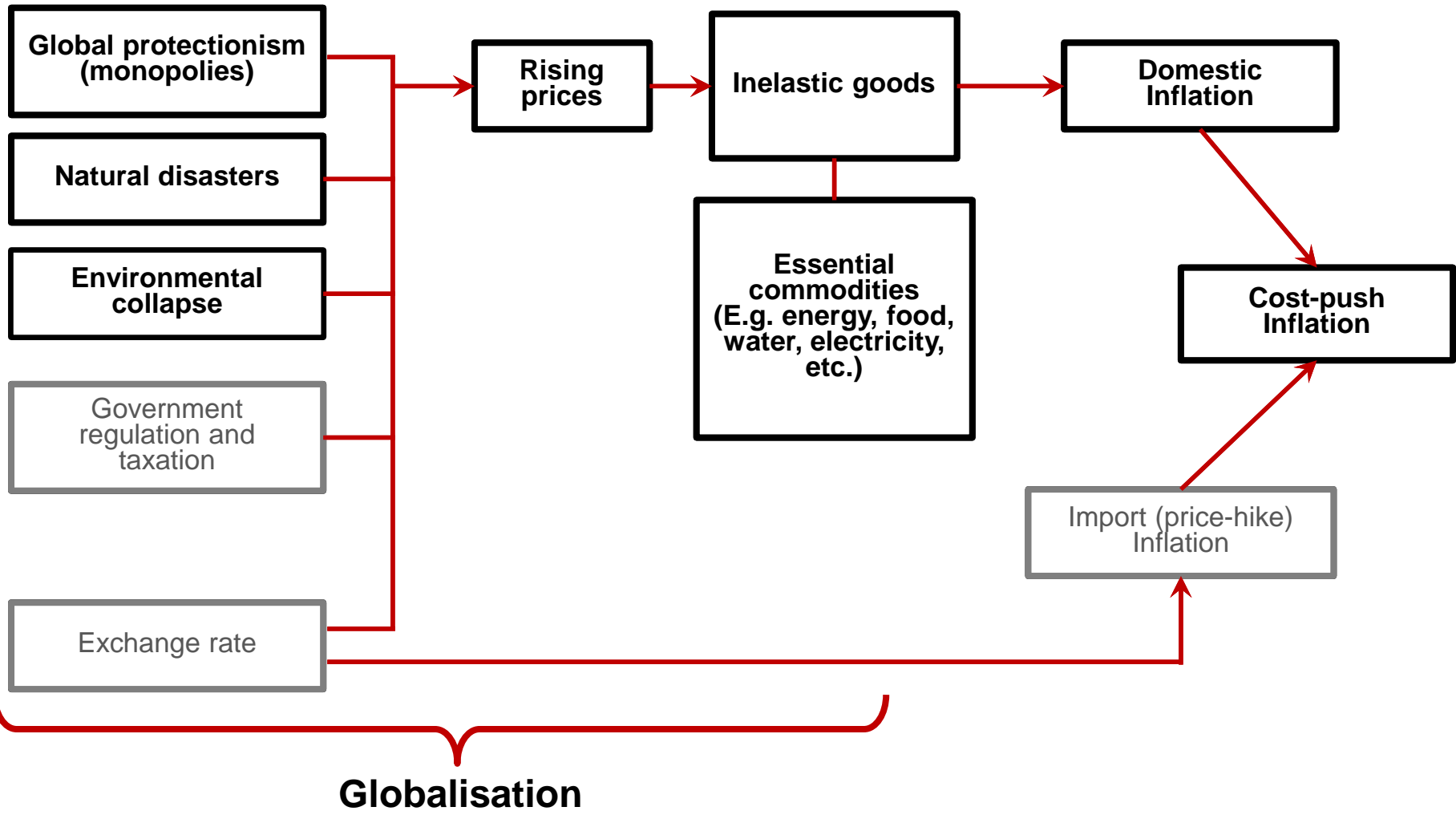
This week, the American Corn Growers Coalition introduced new measures to curtail fuel spending and cut transport costs in an effort to



Recent crop blight has not eased the harsh impact of the oil price spiral on the home-front

Ranchers are pursuing similar methods to raise savings on shipment costs, prompting concern from animal rights groups who fear

# Key Transmission Mechanism



**Globalisation**

# Key Model Input Variables

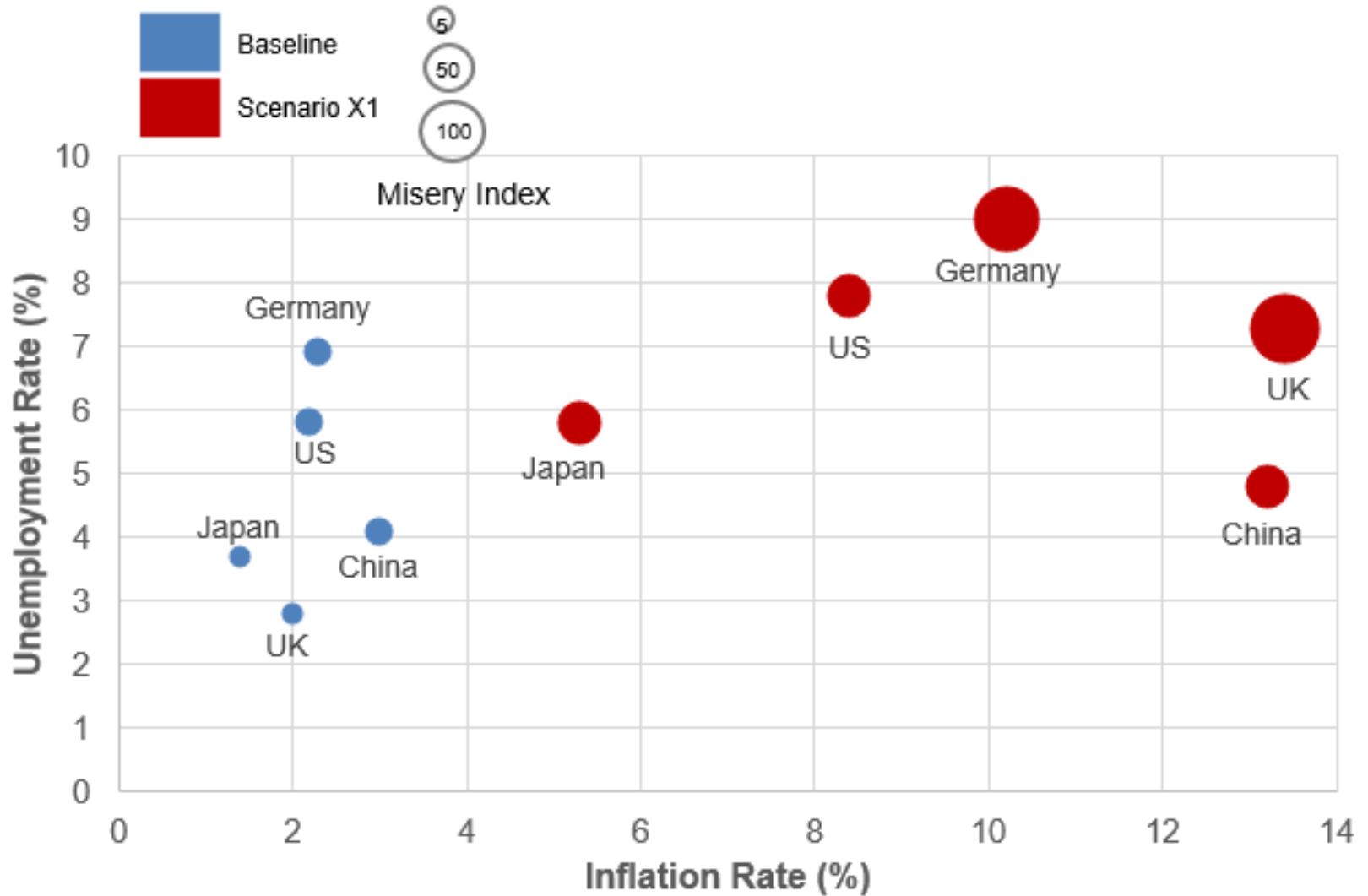
S/N	Macroeconomics input variables	Scenario Variants			Justification for shock	Scenario-specific key assumptions
		S1	S2	X1		
<b>1</b>	<b><i>Global Energy Prices</i></b>					
	Magnitude	210%	280%	440%	<b><i>1973 Oil Embargo</i></b>	<b><i>Global Oil Production</i></b>
	Duration	4 Qtrs				
					<ul style="list-style-type: none"> <li>▪ Expansionary monetary policies (Keynesian principles adopted after WW2)</li> <li>▪ Oil production cut by up to 25%</li> <li>▪ Price of oil increased \$3 to \$12 per barrel, after the oil embargo</li> </ul>	<ul style="list-style-type: none"> <li>▪ OPEC accounts for 40% global production</li> <li>▪ Growing risk of military dictatorship and oil production control</li> </ul>

# Key Model Input Variables

S/N	Macroeconomics input variables	Scenario Variants			Justification for shock	Scenario-specific key assumptions
		S1	S2	X1		
<b>2</b>	<b><i>Global food prices</i></b>					
	Magnitude	180%	250%	310%	<b><i>2007-8 World Food Crisis</i></b> <ul style="list-style-type: none"> <li>▪ World population increased from 6.6 to 6.7 billion</li> <li>▪ Developing countries food imports rose by 25% in 2007</li> <li>▪ On average the world price for rice increased by 217%, whilst wheat increased by 136%, maize by 125% and soybeans by 107% during this period</li> </ul>	<b><i>Global population trend</i></b> <ul style="list-style-type: none"> <li>▪ Population density explosion</li> <li>▪ Higher affluence</li> </ul> <b><i>Changing weather patterns</i></b> <ul style="list-style-type: none"> <li>▪ Extreme natural disasters</li> </ul> <b><i>Rising Oil Prices</i></b> <ul style="list-style-type: none"> <li>▪ Costs of fertilisers and food transportation</li> </ul> <b><i>Bee colony disorders</i></b> <ul style="list-style-type: none"> <li>▪ 71% of world crop species bee-pollinated</li> <li>▪ Up to 75% bee colonies in the US collapse during the 2006-07 period</li> </ul>
	Duration	4 Qtrs				



# High Inflation World



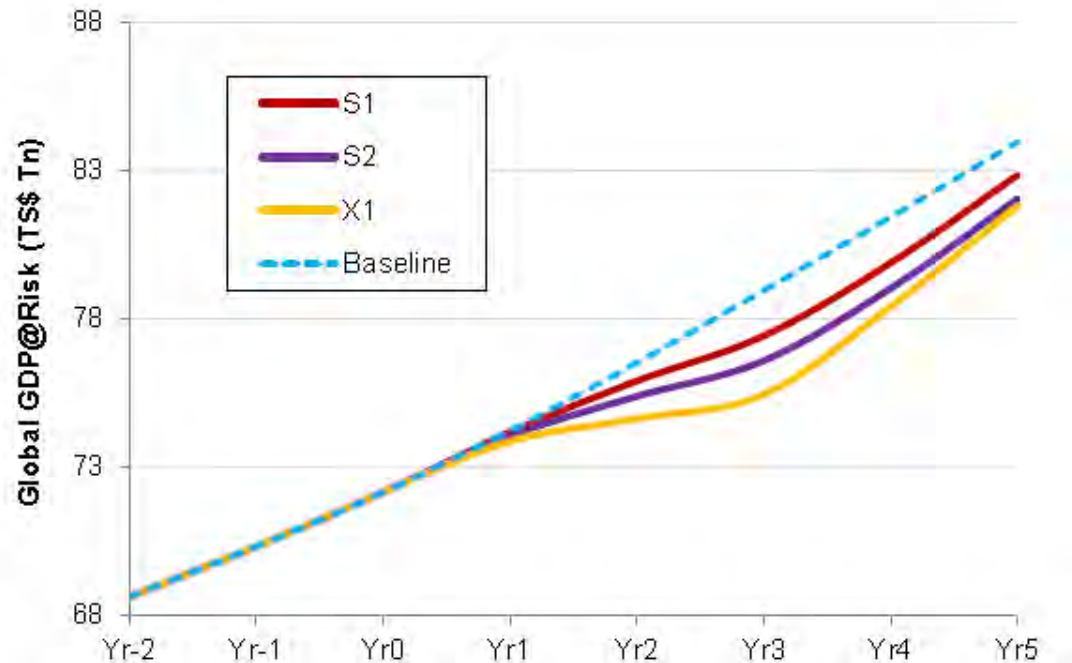
# Global Macroeconomic Impacts - Summary

Macroeconomic losses	S1	S2	X1
<i>Global recession severity</i> (Qtr GDP min. growth rate)	1.9%	1.4%	0.6%
<i>Global recession duration</i>	No recession		
<i>GDP@Risk</i> (5 year loss of global output)	\$4.9 Tn (1.7%)	\$8.0 Tn (2.2%)	\$10.9 Tn (2.6%)

Location	Minimum GDP growth rate (% qtr)			
	Baseline	S1	S2	X1
China	5.3	2.7	1.4	-0.6
Germany	1.0	0.5	0.1	-0.8
Japan	-1.2	-2	-2.5	-3.2
United Kingdom	2.2	1.2	0.6	-0.7
United States	2.7	0.6	-0.2	-1.6
World	2.7	1.9	1.4	0.6

# Global Macroeconomic Impacts - GDP@Risk

Scenarios	Baseline	S1		S2		X1	
Locations	5-year GDP	GDP@Risk (US\$, Tn)	GDP@Risk (%)	GDP@Risk (US\$, Tn)	GDP@Risk (%)	GDP@Risk (US\$, Tn)	GDP@Risk (%)
China	48.4	1.1	2.9%	2.0	3.9%	2.7	4.6%
Germany	19.1	0.1	1.1%	0.2	1.5%	0.5	1.7%
Japan	29.3	0.3	1.3%	0.4	1.8%	0.7	2.1%
United Kingdom	14.0	0.2	1.5%	0.3	2.2%	0.4	2.7%
United States	88.9	1.6	2.4%	2.5	3.1%	3.4	3.6%
<b>World</b>	<b>395.0</b>	<b>4.9</b>	<b>1.7%</b>	<b>8.0</b>	<b>2.2%</b>	<b>10.9</b>	<b>2.6%</b>





## However in Reality...

- The world we live in today VS
- Counterfactual scenario narrative we described

So how will our results differ?

# Signals or Noise?



Chicago Tribune

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## Futures support view of Fed raising rates in mid-2015

10:17 AM ET  
Jul 16, 2015

## WSJ Survey: Most Economists Expect Fed

THE WALL STREET JOURNAL

2 Dec 2015

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## Yellen Signals Fed on Track to Raise Rates in December

Fed chief says gains in labor market bolster her confidence that inflation will return to 2%

## U.S. Fed likely Reuters poll

WASHINGTON | BY MEGAN CASSELLA

FINANCIAL TIMES

[ft.com/globaleconomy](http://ft.com/globaleconomy)

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October 18, 2015 2:51 pm

## Economists still see Fed rate rise before year-end

Eric Platt in New York



# Reflections in our real world

*Imagine...*

- Short-term interest (Fed) rates now raised
- High inflation world sets in due to exogenous events
  - What are the mitigation options by governments and central banks

*Counter measures...*

- Contractionary monetary policy
  - Main goal of reducing money supply in the economy
  - Further increase interest rates
- Another option is to increase the reserve requirements banks are legally required to keep to cover withdrawals
  - Reduces the money (supply) in circulation
  - Further adds credit stresses to the banking sector

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