Commodity Price Insurance: A Keynesian Idea Revisited

OIES Seminar

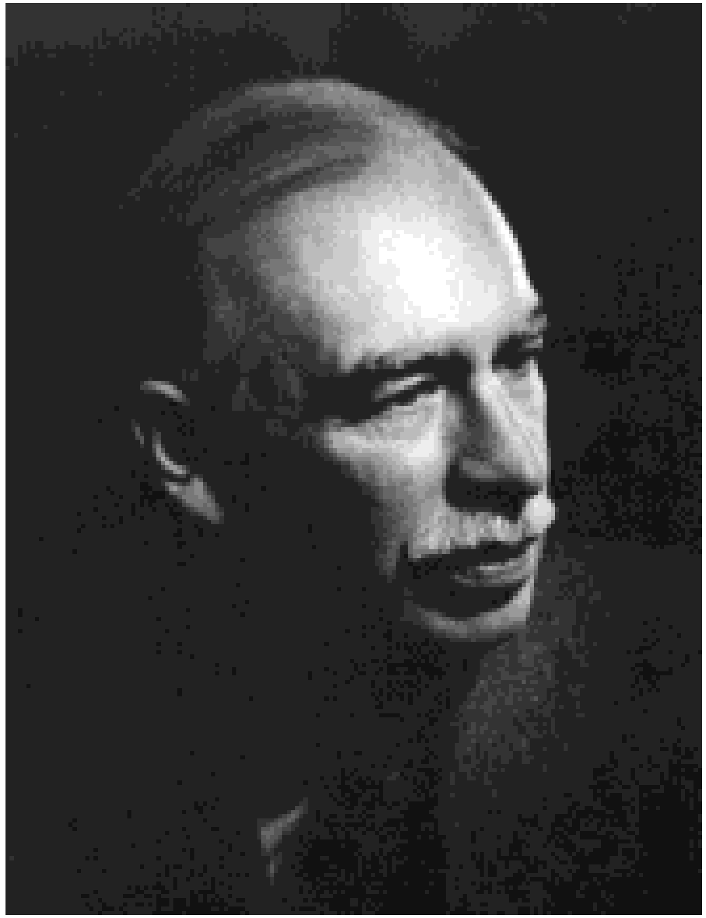
25 February 2003

John Bower   Nawal Kamel

Commodity price stabilisation mechanisms

At Bretton Woods conference Keynes' proposal lead to creation of IMF and World Bank…

JOHN MAYNARD KEYNES (June 5, 1883 - April 21, 1946)



Commodity price stabilisation mechanisms

… but his Commod Control idea was vetoed by the US and UK Treasury

COMMOD CONTROL

1. Prevent macroeconomic dislocations that had created Great Depression and WWII

   - Create physical buffer stocks of key commodities to be held in London
   - Finance their purchase with gold released from the Bank of England
   - Sell / Buy stocks when prices rise 10% above / below true long run equilibrium level

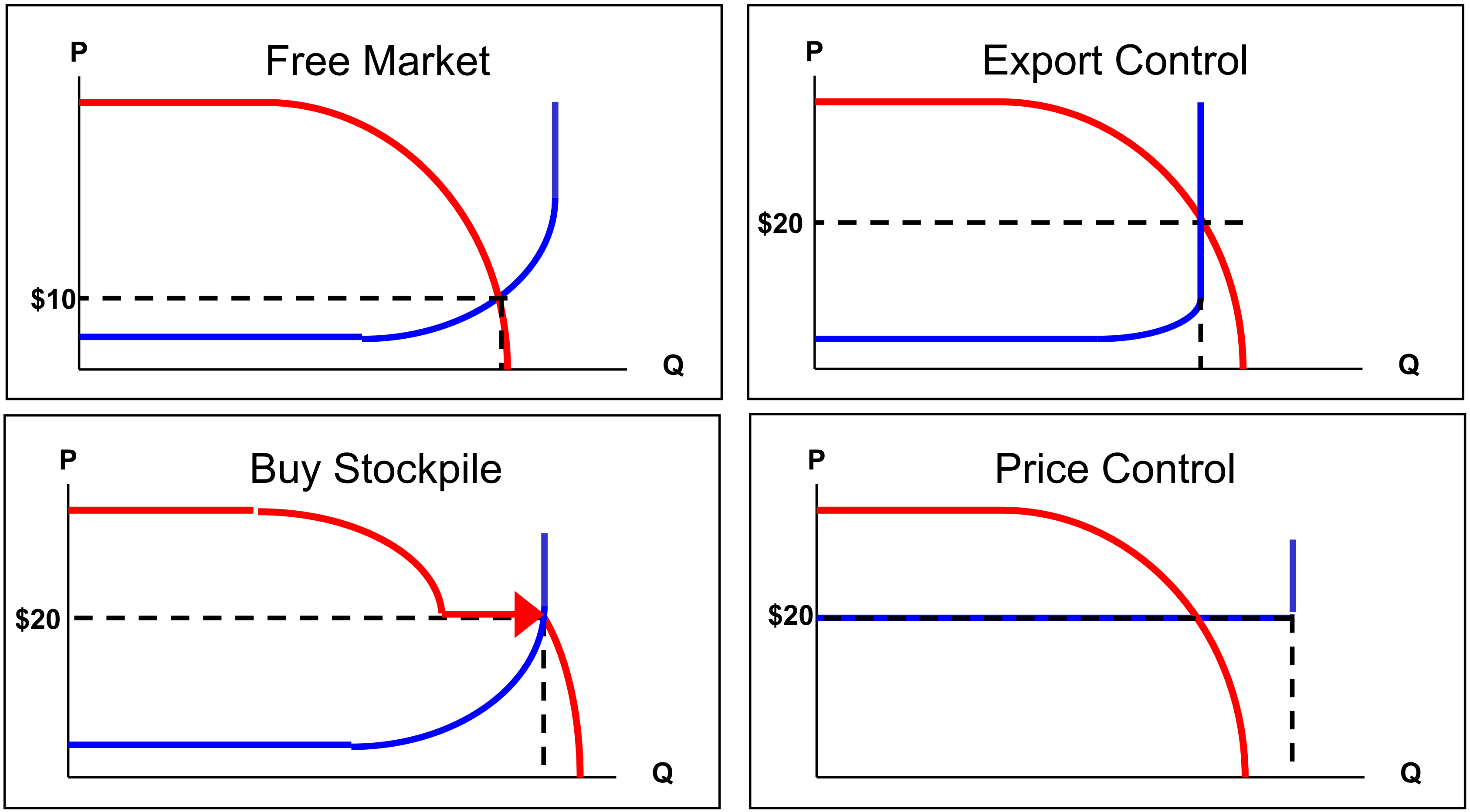
2. Objections to scheme that were raised

   - Buffer stock may run if prices rise is strong or finance may run out if prices fall
   - May cause under consumption if central stabilisation price is set above true equilibrium price

Commodity price stabilisation mechanisms

Keynes' recognised other measures may be required too such as import-export controls…

ALTERNATIVE MECHANISMS TO SUPPORT SPOT COMMODITY PRICES



Commodity price stabilisation mechanisms

… but now global capital markets may offer an alternative to commodity buffer stocks…

DERIVATIVE CONTRACT OPEN INTEREST

	OTC			Exchange Traded		
	Dec. 1998	**Dec. 2001**	**Change**	**Dec. 1998**	**Dec. 2001**	**% Change**
	$bn	$bn	%	$bn	$bn	%
Foreign exchange contracts	**18011**	**16748**	**-7.0%**	**80.9**	**93**	**15.0%**
Forwards, forex swaps, futures	12063	10336	-14.3%	31.7	65.6	106.9%
Currency swaps	2253	3942	75.0%	-	-	-
Options	3695	2470	-33.2%	49.2	27.4	-44.3%
Interest rate contracts	**50015**	**77513**	**55.0%**	**12654.9**	**21758.1**	**71.9%**
Forward rate agreements, futures	5756	7737	34.4%	8031.4	9265.3	15.4%
Interest rate swaps	36262	58897	62.4%	-	-	-
Options	7997	10879	36.0%	4623.5	12492.8	170.2%
Equity-linked contracts	**1488**	**1881**	**26.4%**	**1200**	**1946.9**	**62.2%**
Forwards, swaps, futures	146	320	119.2%	292.1	341.7	17.0%
Options	1342	1561	16.3%	907.9	1605.2	76.8%
Commodity contracts	**415**	**598**	**44.1%**	**N/A**	**N/A**	**26.3%**
Other Contracts	**10389**	**14375**	**38.4%**	**N/A**	**N/A**	**265.1%**

Source: Bank for International Settlements

Note: Exchange Traded Commodity contract data is calculated from contract open interest not notional value
Exchange Traded Other Contracts includes Single Equity option contracts only

Commodity price stabilisation mechanisms

… by insuring economies against severe commodity price shocks – up or down!

COMMODITY PRICE INSURANCE (CPI)

1. Global Commodity Insurer (GCI) established as the new Commod Control
2. GCI sells CPI-Max and CPI-Min contracts on 49 commodities in IMF Commodity Index
3. Governments buy insurance contracts on net national export or import exposure
4. Duration of cover is maintained to at least the 5 year horizon
5. CPI-Max pays out if mean annual spot price is >10% above LR equilibrium price
6. CPI-Min pays out if mean annual spot price is >10% below LR equilibrium price

An increasing need

Almost all global commodity price stabilisation mechanisms established since WWII failed

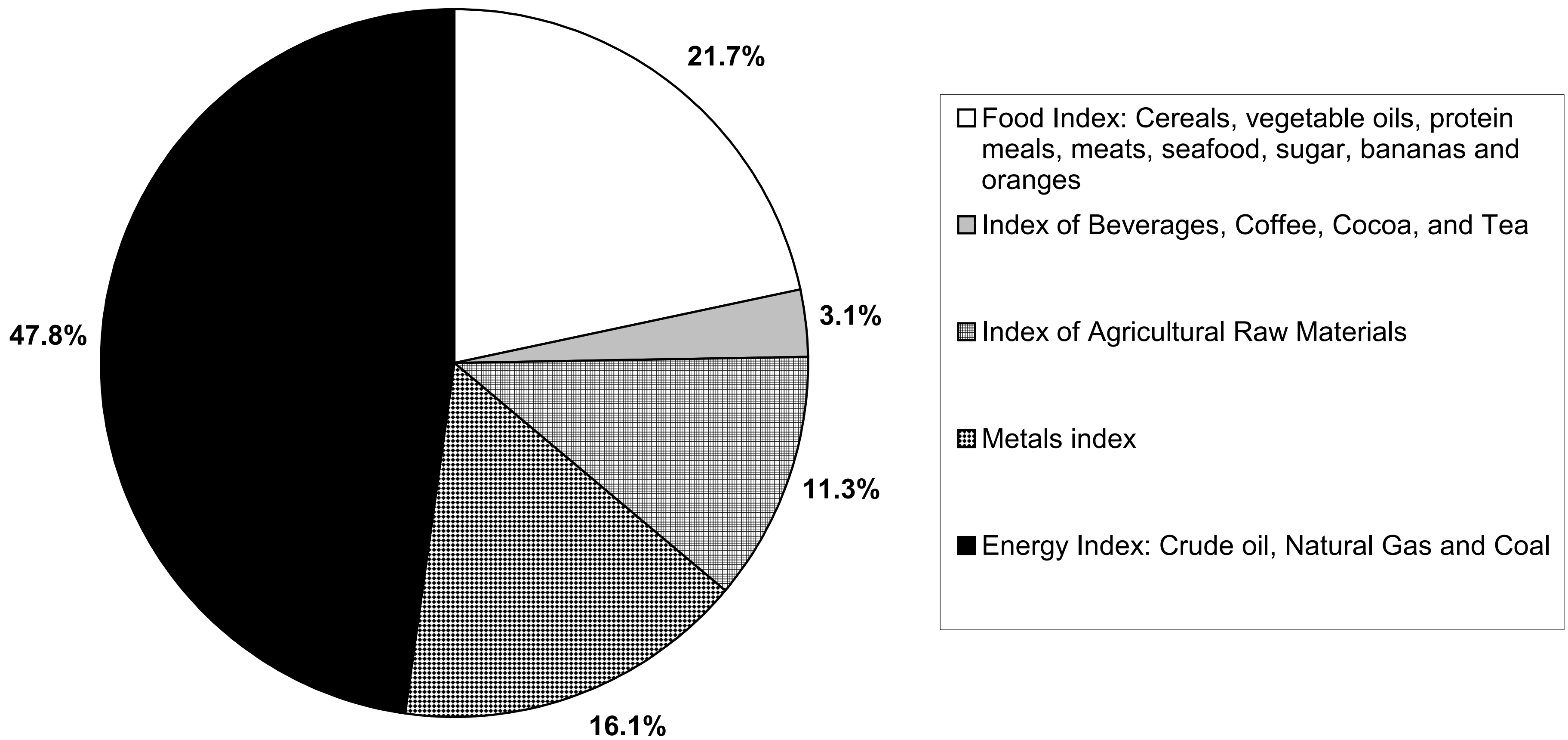
INTERNATIONAL COMMODITY PRICE STABILISATION SCHEMES

1. Sugar Agreement (1954-1983)
2. Tin Agreement (1954-1985)
3. Coffee Agreement (1962-1989)
4. Cocoa Agreement (1972-1988)
5. Rubber Agreement (1979-1999)
6. OPEC (1961-today) and IEA (1974-today)

An increasing need

Energy now dominates the world commodity export trade with…

NEW IMF TRADE WEIGHTED (1995-1997) COMMODITY PRICE INDEX



An increasing need

… Developed and Developing economies having similar long term debt liabilities …

DEVELOPED AND DEVELOPING WORLD ECONOMIC INDICATORS

Economic Groups	**GDP Consumption**		**GDP Investment**	**Public Debt/GDP**
	Public	Private		
Developed Countries	16%	59%	25%	4.0%
Developing Countries	13%	61%	25%	1.3%
OPEC Members	15%	58%	20%	3.1%
Other Developing Countries	13%	61%	25%	1.2%
Eastern Europe	16%	58%	21%	2.1%

Source:UNCTAD Handbook of Statistics 2002 (GDP) and Bank For International Settlements (Public Debt)

Note: GDP Consumption + GDP Investment = Exports - Imports
Public Debt = Internationally Issued Public Debt Securities
+ Domesticly Issued Public Debt Securities
+ Consolidated Bank Claims on Public Sector

An increasing need

… with Developed and Developing world now reciprocally exposed to an oil price shock…

GLOBAL COMMODITY EXPORT TRADE BY ECONOMIC GROUP

Economic Groups	SITC	1955				1999			
		Developed	Developing	Socialist	World	Developed	Developing	E. Europe	World
All Food Items	0+1+22+4	16.5%	36.5%	19.2%	21.8%	7.6%	8.5%	4.9%	7.8%
Agricultural Raw Materials	2-22-27-28	9.8%	20.5%	13.2%	12.9%	1.9%	2.1%	3.2%	2.0%
Ores and Metals	27+28+68	6.5%	9.9%	7.8%	7.5%	2.5%	3.5%	6.9%	3.0%
Fuels	3	5.5%	25.2%	12.0%	11.2%	3.3%	14.3%	18.6%	7.2%
Total Primary Commodities	0+1+2+3+4-68	38.3%	92.1%	52.2%	53.4%	15.3%	28.4%	33.6%	20.0%
Total Manufactured Goods	5+6+7+8+9-68	61.7%	7.9%	47.8%	46.6%	84.7%	71.6%	66.4%	80.0%
Total Exports		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Economic Groups	SITC	1955				1999			
		Developed	Developing	Socialist	World	Developed	Developing	E. Europe	World
All Food Items	0+1+22+4	43.0%	39.7%	36.7%	40.9%	49.7%	29.9%	14.6%	39.0%
Agricultural Raw Materials	2-22-27-28	25.7%	22.2%	25.2%	24.1%	12.4%	7.4%	9.5%	10.0%
Ores and Metals	27+28+68	17.0%	10.8%	15.0%	14.1%	16.3%	12.3%	20.5%	15.0%
Fuels	3	14.4%	27.4%	23.0%	21.0%	21.6%	50.4%	55.4%	36.0%
Total Primary Commodities	0+1+2+3+4-68	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Handbook of International Trade and Development Statistics 1969 (1955 data), UNCTAD Handbook of Statistics 2002 (1999 data)

An increasing need

… and interdependence increasing as Developed country oil (coal + gas) reserves decline

GLOBAL COMMODITY EXPORT TRADE BY ECONOMIC GROUP

Economic Groups	Commodity Trade v Total Trade			GDP By Activity			
	Exports	Imports	Exports/Imports	Agriculture	Other Primary	Manufacturing	Services
World	24%	24%	100%	-	-	-	-
Developed Countries	19%	22%	88%	2%	23%	4%	71.0%
Developing Countries	31%	22%	141%	14%	11%	24%	51.0%
OPEC Members	77%	25%	308%	15%	22%	18%	45.0%
Other Developing Countries	23%	22%	106%	13%	11%	25%	51.0%
Eastern Europe	41%	28%	146%	7%	27%	9%	57.0%

* Major Petroleum Exporting Countries include 11 OPEC countries for Export-Import data columns but top 20 oil exporting countries for GDP by Activity columns

Source: UNCTAD Handbook of Statistics 2002 (1999 data)

An increasing need

Not surprisingly the OPEC and IEA oil buffer stocks are the only schemes to endure

OPEC STATUTE

Article 2.

B. The organization shall devise ways and means of ensuring the stabilization of prices in international oil markets with a view to eliminating harmful and unnecessary fluctuations

Source: www.opec.org/Publications/OS/OS.pdf

THE ONLY PRESIDENTIALLY –ORDERED EMERGENCY USE OF SPR

The rapid decision to release crude oil from government-controlled stocks in the United States and other OECD countries helped calm the global oil market, and prices began to moderate. On January 30, 1991, the Energy Department accepted bids from 13 companies offering the best prices for 17.3 million barrels of Strategic Reserve oil.

Source: www.fossil.energy.gov/spr/spr_oilreleases.shtml

How oil CPI would work

LR equilibrium price and mean reversion parameter has been estimated for oil and…

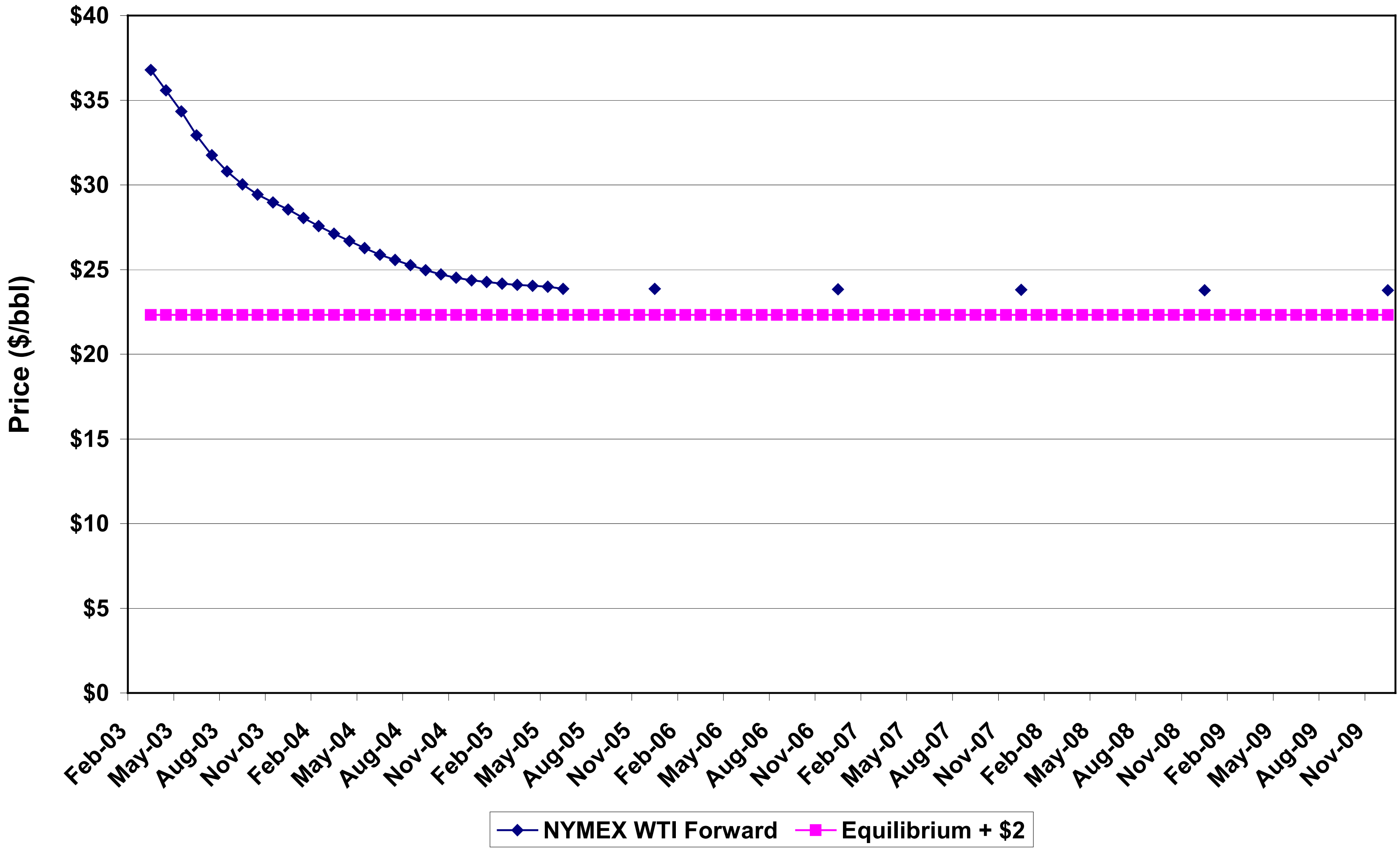
10 YEAR EQUILIBRIUM OIL PRICE

Index Constituents	Index Weight %	Equilibrium Prices	Strike Prices		CPI Values	
			CPI-Max	CPI-Min	CPI-Max	CPI-Min
Oil; Average of U.K. Brent, Dubai, and West Texas Intermediate	39.9	20.32	22.35	18.28	1.00	0.61

How oil CPI would work

… and even under current system stress LR forward price is close to LR equilibrium

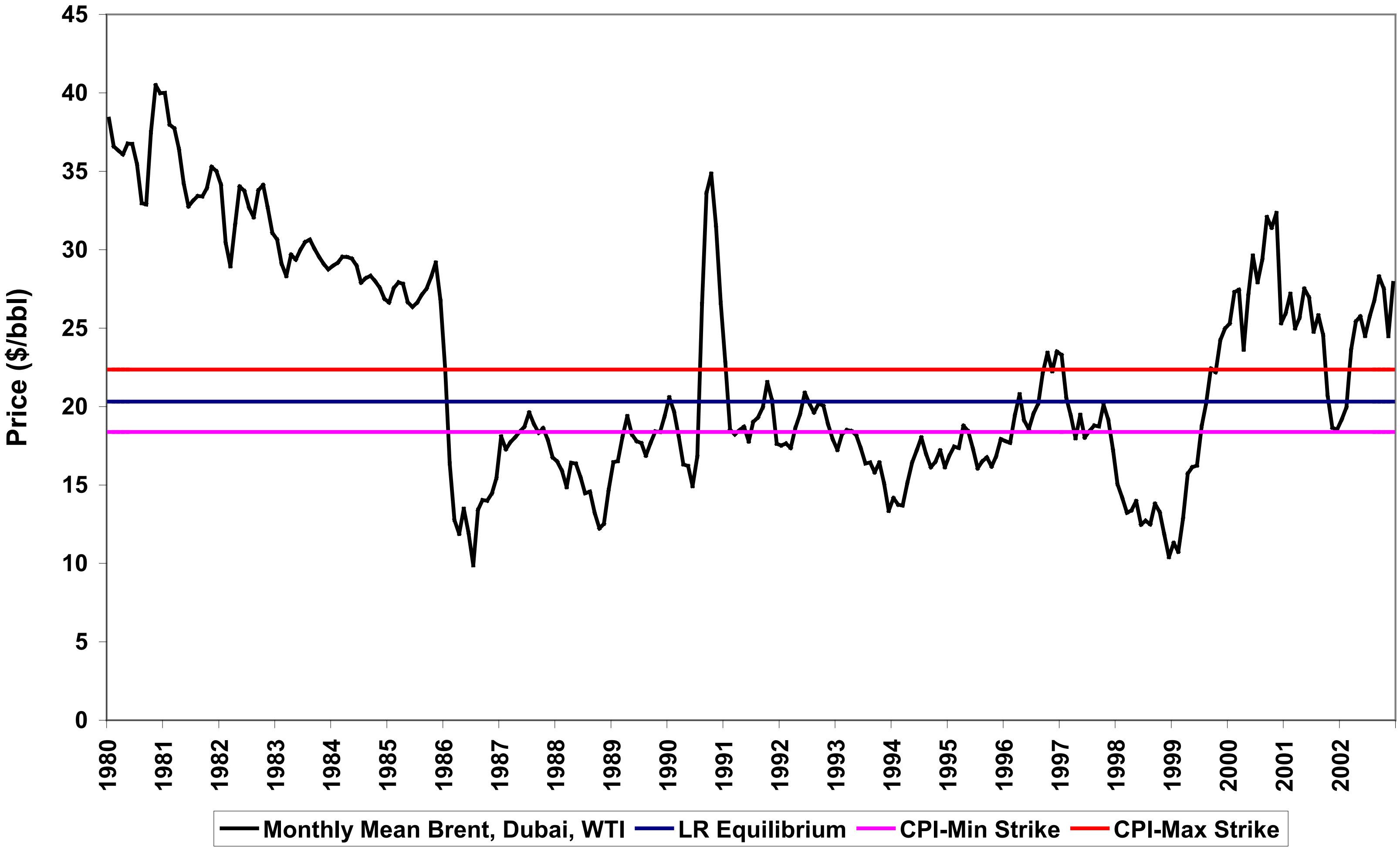
NYMEX FORWARD CURVE (23 FEB 2003) AND EQUILIBRIUM PRICE



How oil CPI would work

GCI hedges CPI-Max and CPI-Min contract sales with cheap Asian Call and Put options…

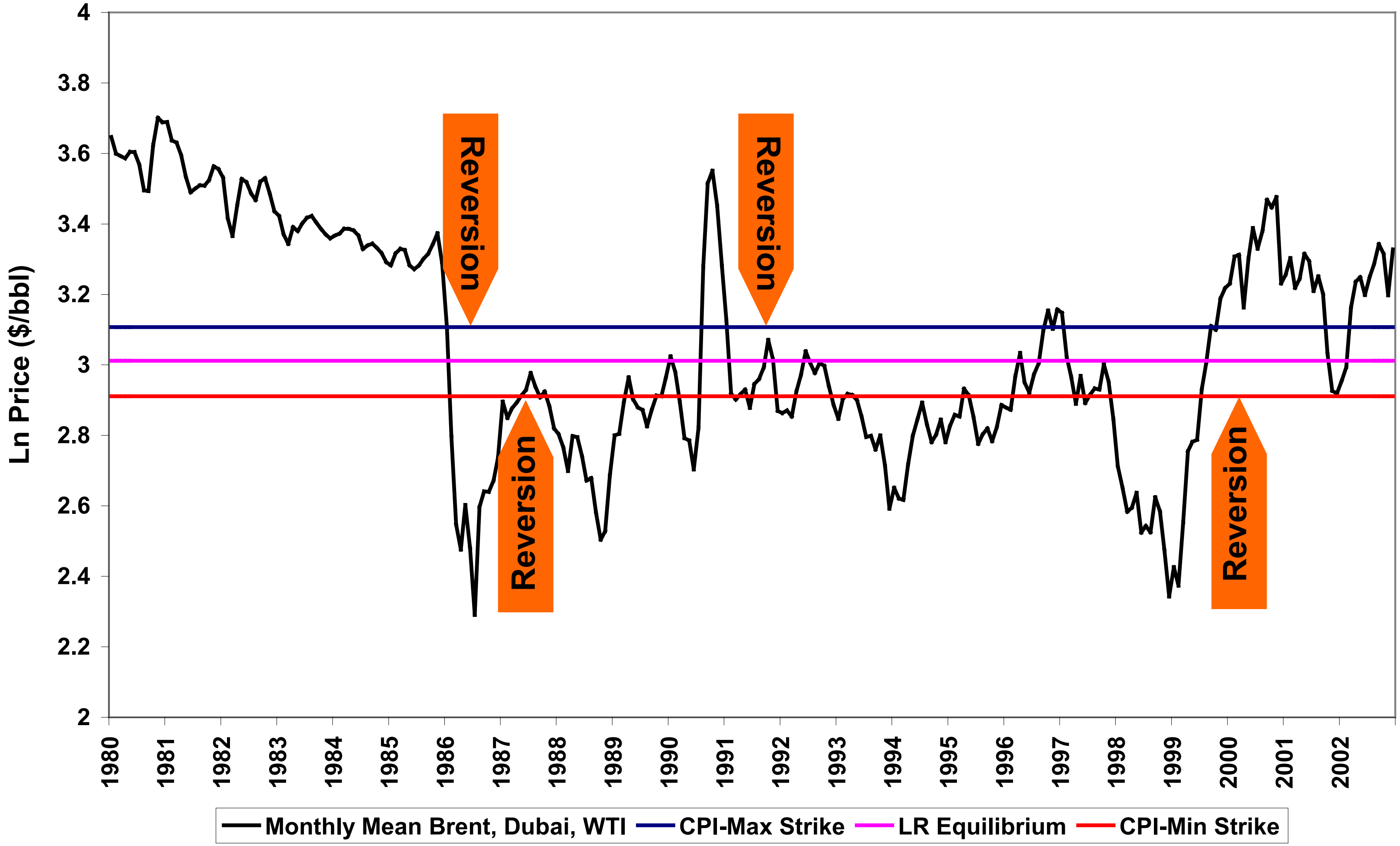
HISTORIC CPI INTERVENTIONS WITH 10% MAX MIN STRIKE PRICES



How oil CPI would work

… because of log price mean reversion process and pay off against annual mean price

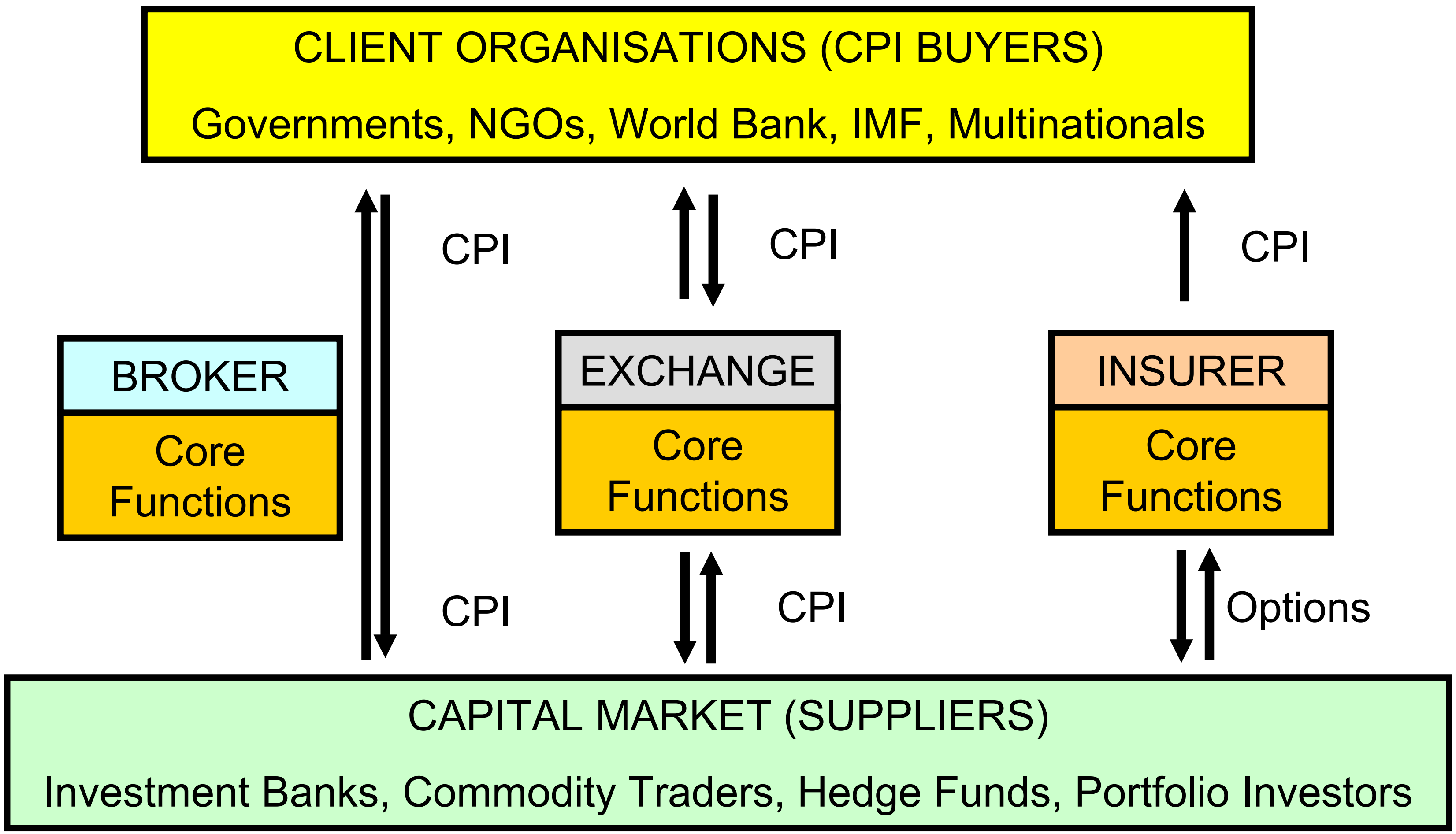
HISTORIC CPI INTERVENTIONS WITH 10% MAX MIN STRIKE PRICES



Issues to be resolved

GCI initially could be CPI contract market maker but then gradually withdraw …

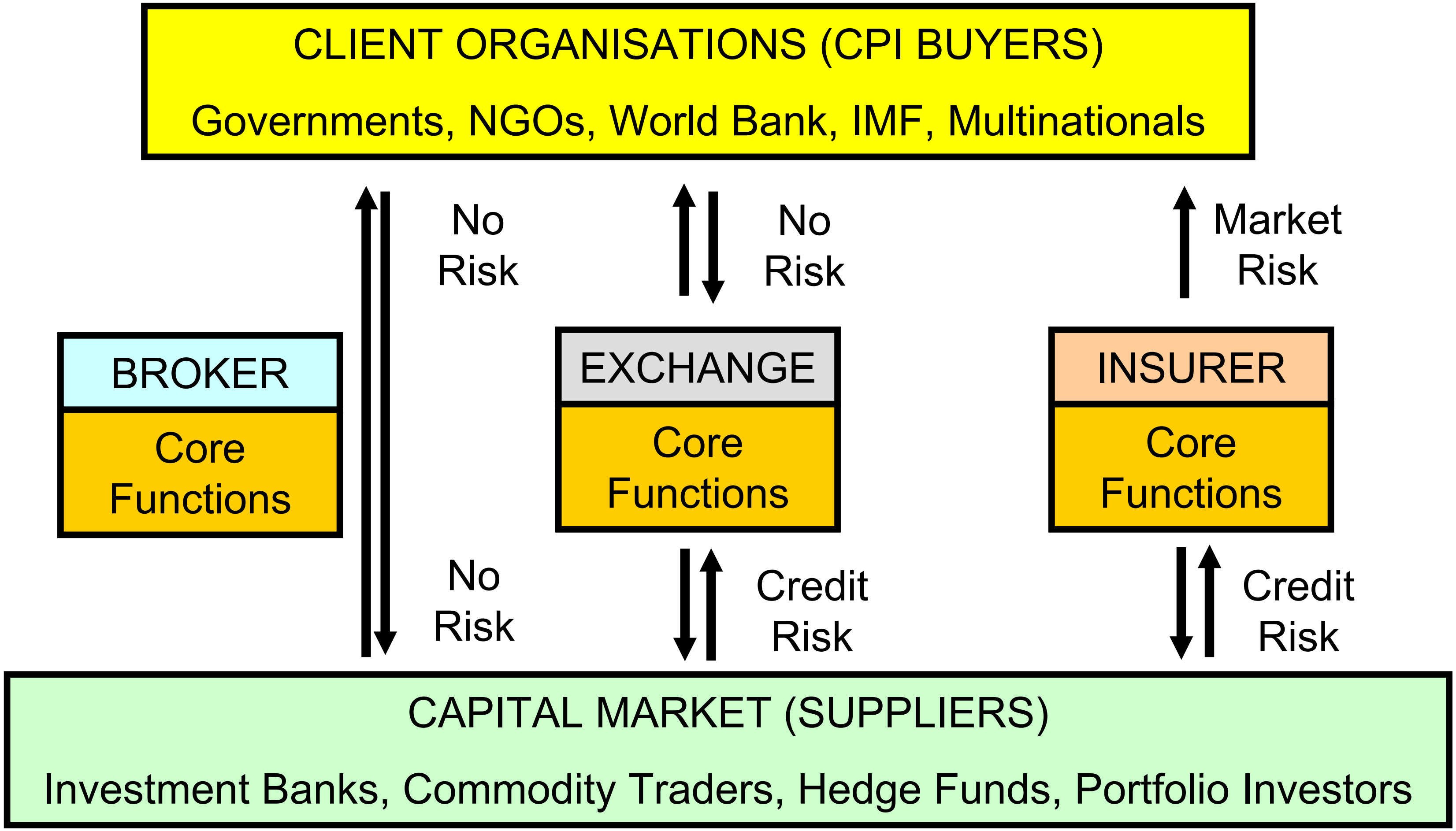
GCI STRUCTURE



Issues to be resolved

… its role determines the type of risk and amount of risk capital required

GCI STRUCTURE



Speaker

John Bower is Senior Research Fellow at the Oxford Institute for Energy Studies. His research interest is in the emergence and evolution of cross-border electricity and gas markets. Specifically; the development of efficient pricing and investment mechanisms for transmission capacity, integration of energy markets, and energy price / credit risk management.

John's previous career was in the commodity industry and his experience ranges from energy trading, at Marc Rich & Co, to risk management consultancy, with Coopers & Lybrand, advising commodity traders, producers and processors in base metal, precious metal, 'softs' and energy markets. Before joining the PhD programme he was Global Controller Metals/Commodities at Deutsche Morgan Grenfell.

John completed his PhD at London Business School in 2000. He also has an MBA from London Business School and an MA in Biochemistry from Oxford University.

Oxford Institute for Energy Studies

57 Woodstock Road

Oxford OX2 6FA

United Kingdom

Telephone: +44 (0)1865 311 377

Facsimile: +44 (0)1865 310 527

Email: john.bower@oxfordenergy.org

URL: http://www.oxfordenergy.org