

Somebody knows something: Oil & Gas Modelling

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CIBS & RCEM PROJECTS - Past & Future

- The ACEGES model: Fundamentals of oil and gas markets
- Brent & WTI oil prices: Probabilistic projections
- The GAMLSS framework: Regression models
- The GEST framework: Time series models
- Strategic Risks: European shale gas
- The ACEWEM model: Fundamentals of wholesale electricity markets

WHY MODEL?

- **Everyone runs some models**: Some of us run **explicit** models while others run **implicit** models
- Well designed models can be the **focal points of teams** involving experts from many disciplines
- Models can **discipline the dialogue** about (policy) options and make unavoidable judgments more considered

• ...fine but can you **accurately forecast ... ? NO**
but:

- I can **bound** outcomes to plausible ranges
- I can **illuminate** core dynamics
- I can **demarcate** core uncertainties
- I can **discover** new questions
- I can **offer** crisis options
- I can **demonstrate** tradeoffs
- I can **challenge** the robustness of energy strategies
- I can **reveal** the apparently simple to be complex (but not complicated)

The ACEGES model: OIL & GAS FUNDAMENTALS

Contributors

Carlo Di Maio (Deutsche Bank)

Mikis Stasinopoulos

Kenichi Matsumoto (University of Shiga Prefecture, Japan)*

Robert Rigby

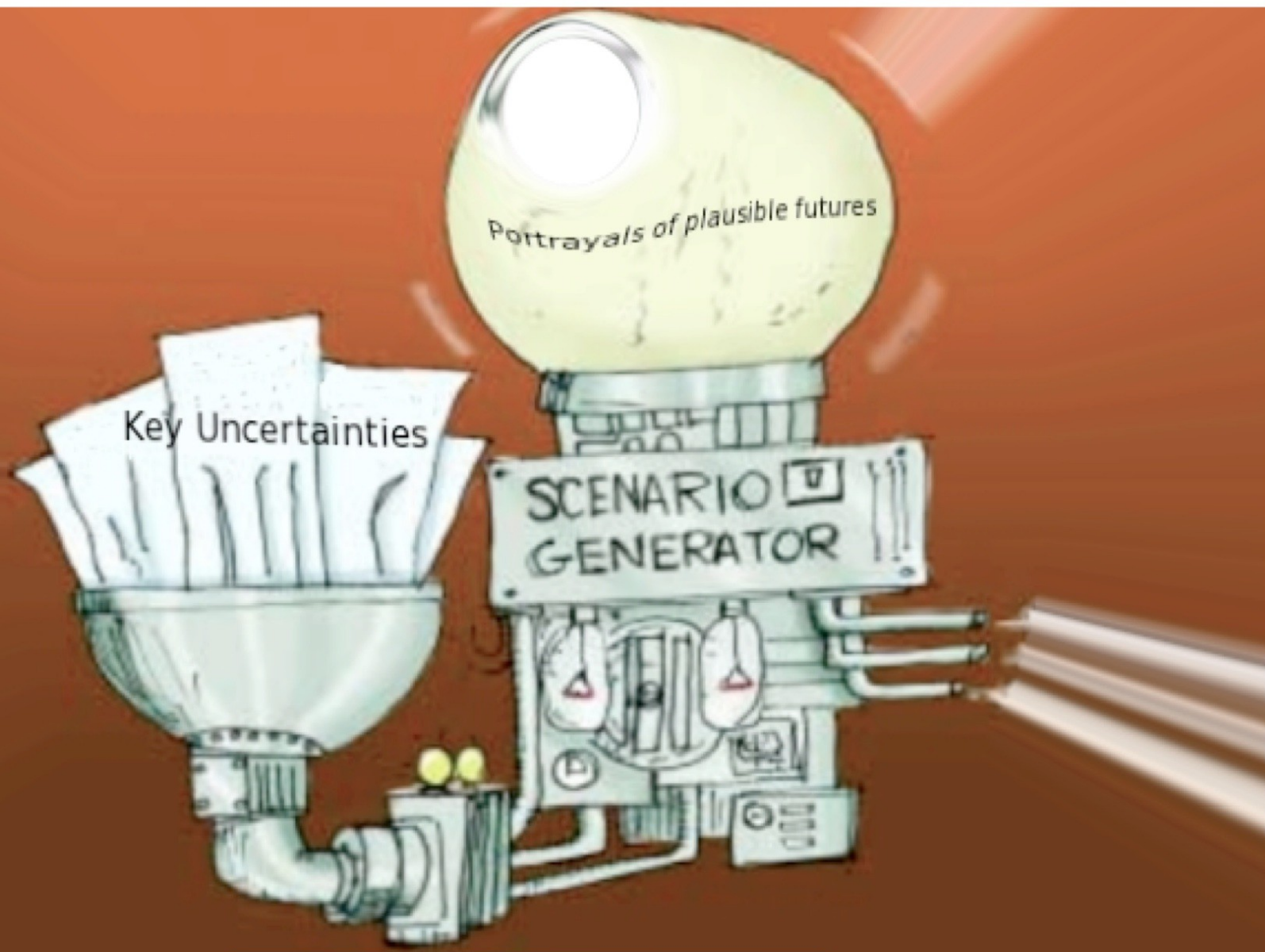
Michael Jefferson

John Sedgwick

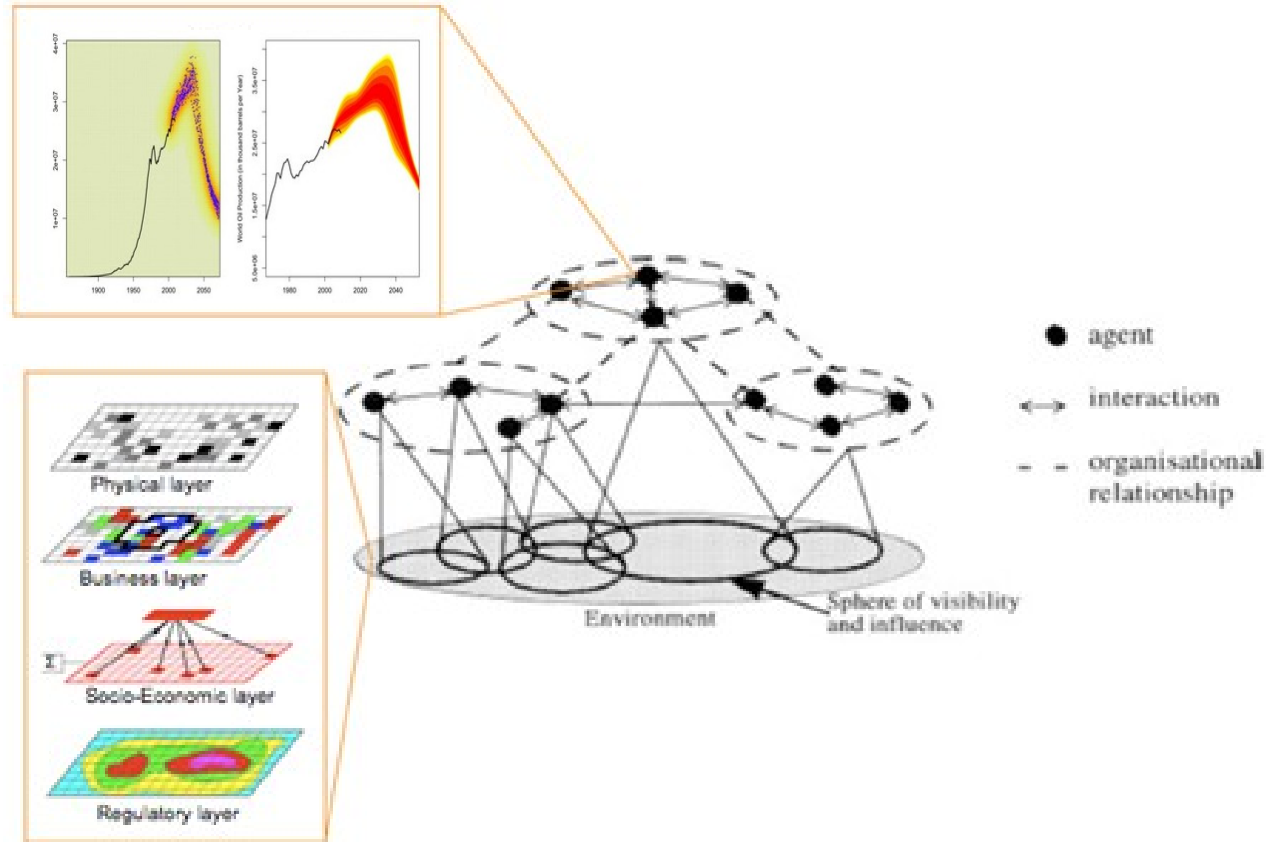
Vlasios Voudouris

*ACEGES funding by the Japanese Society for the Promotion of Science

The ACEGES model – Concept

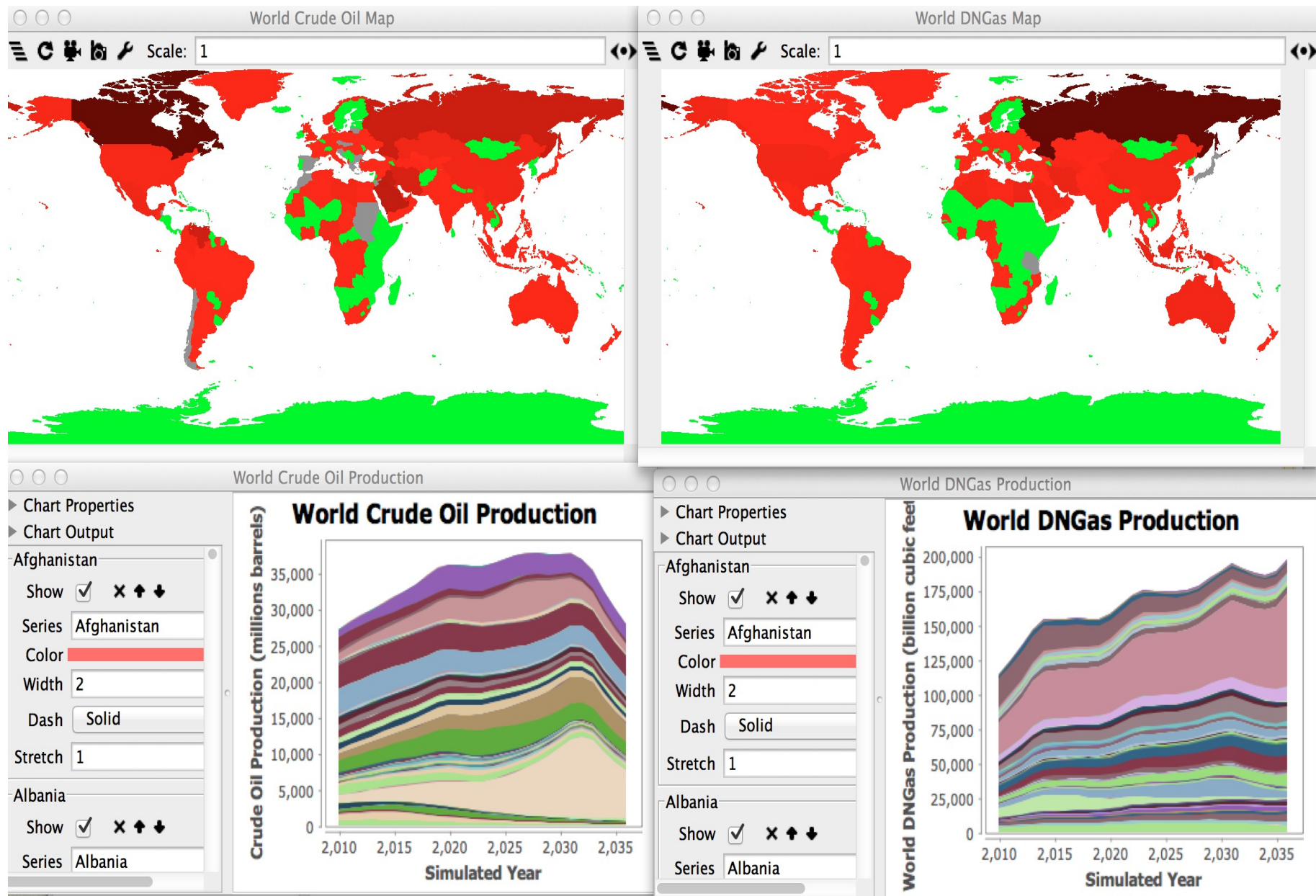


The ACEGES model – The building blocks



**Informed and integrated micro-macro view:
Better exploration of market dynamics and risks**

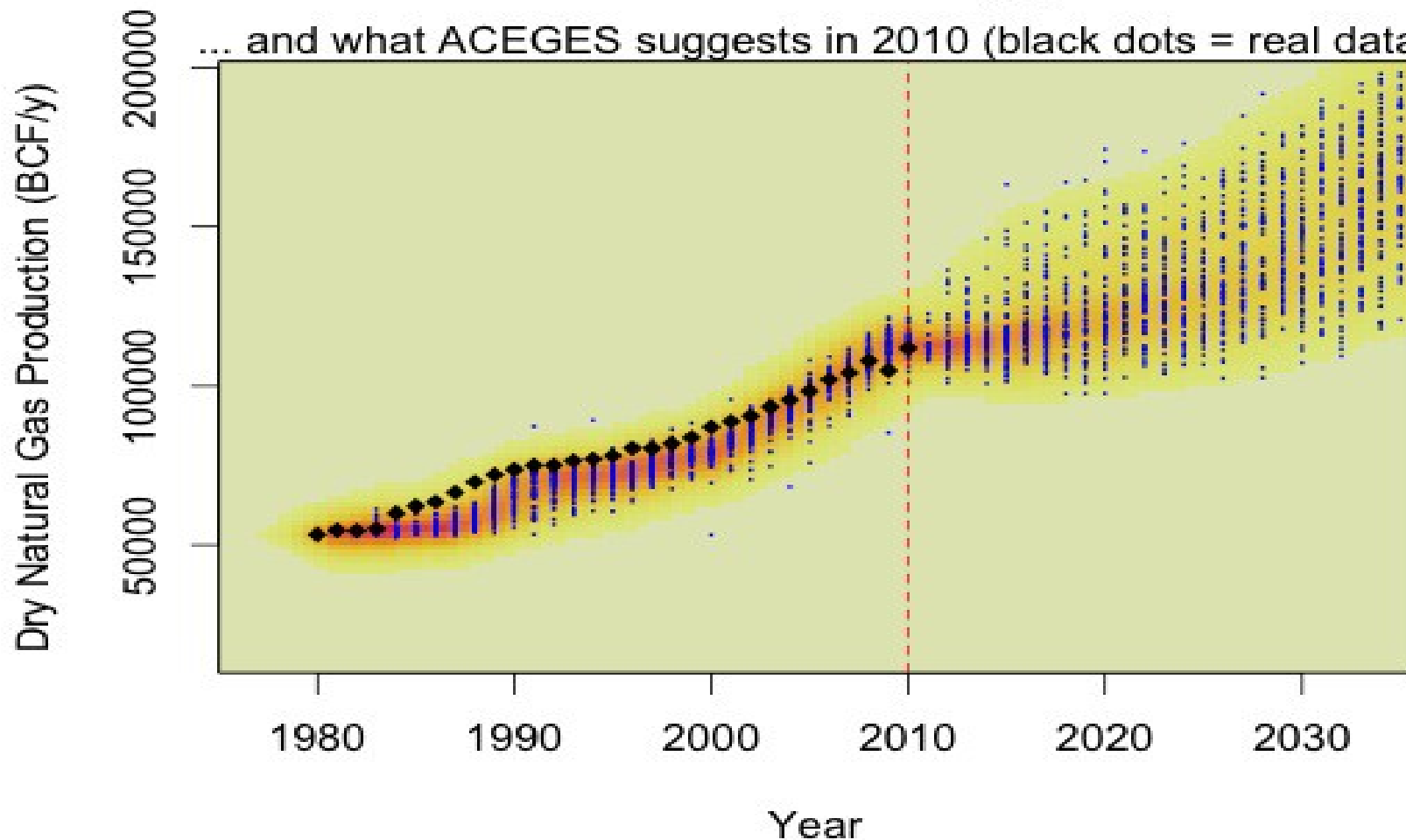
The ACEGES tool – The computational laboratory of the oil and gas market



The ACEGES scenarios: An example

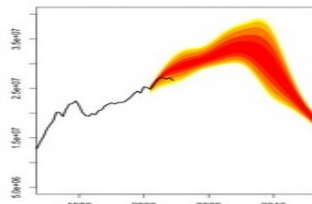
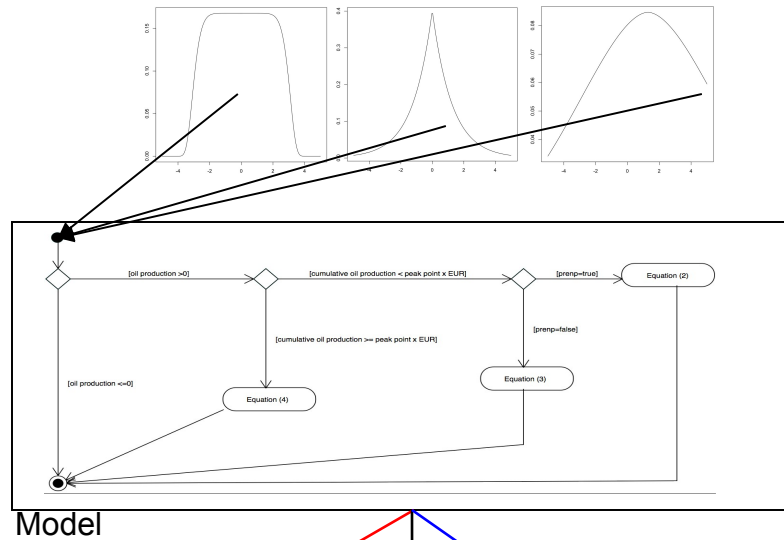
What would have ACEGES suggested in 1980

... and what ACEGES suggests in 2010 (black dots = real data)

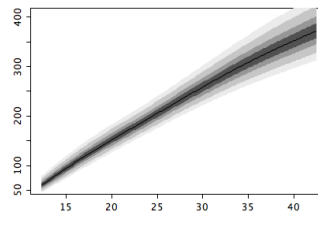


ACEGES-based scenarios : How?

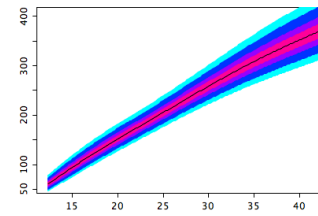
Uncertainties



Scenario 1

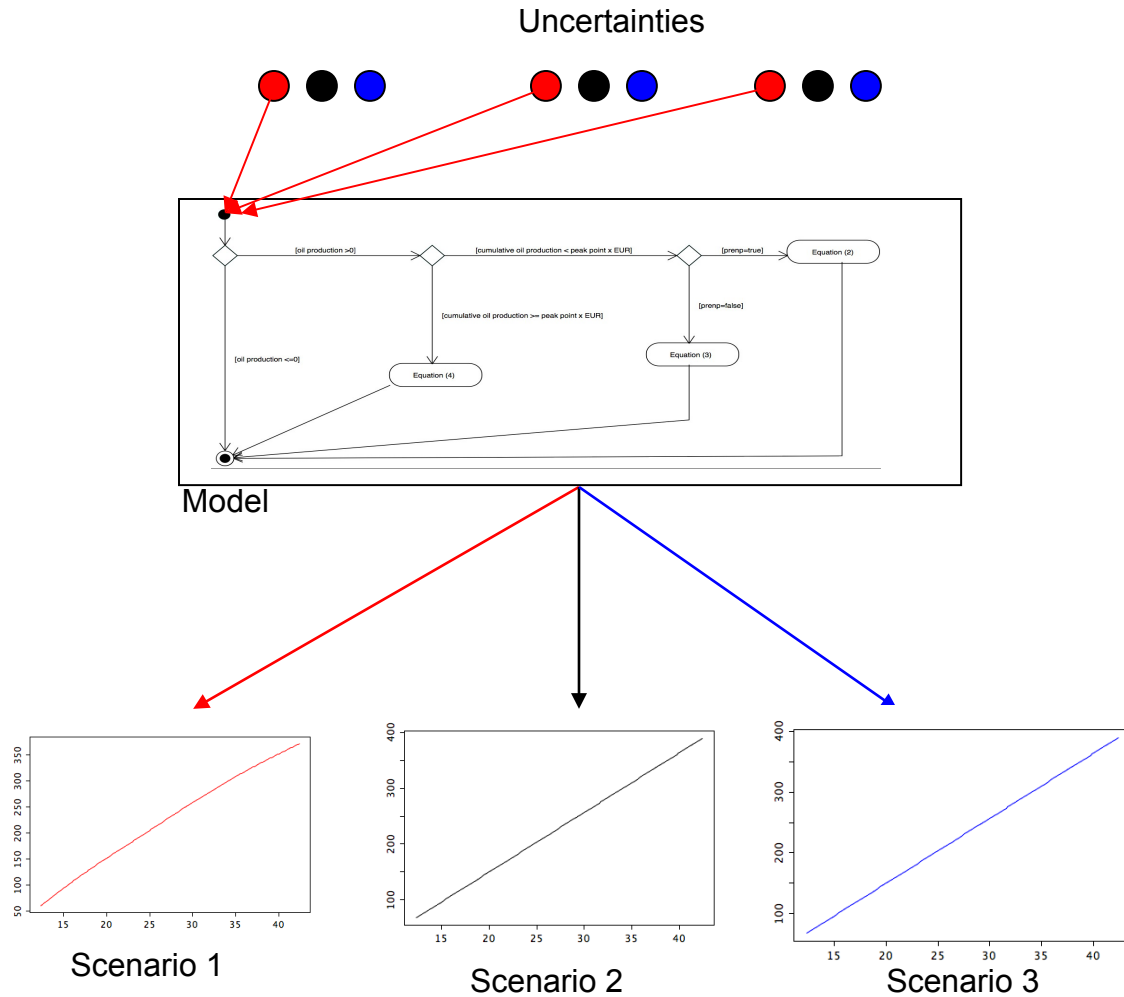


Scenario 2

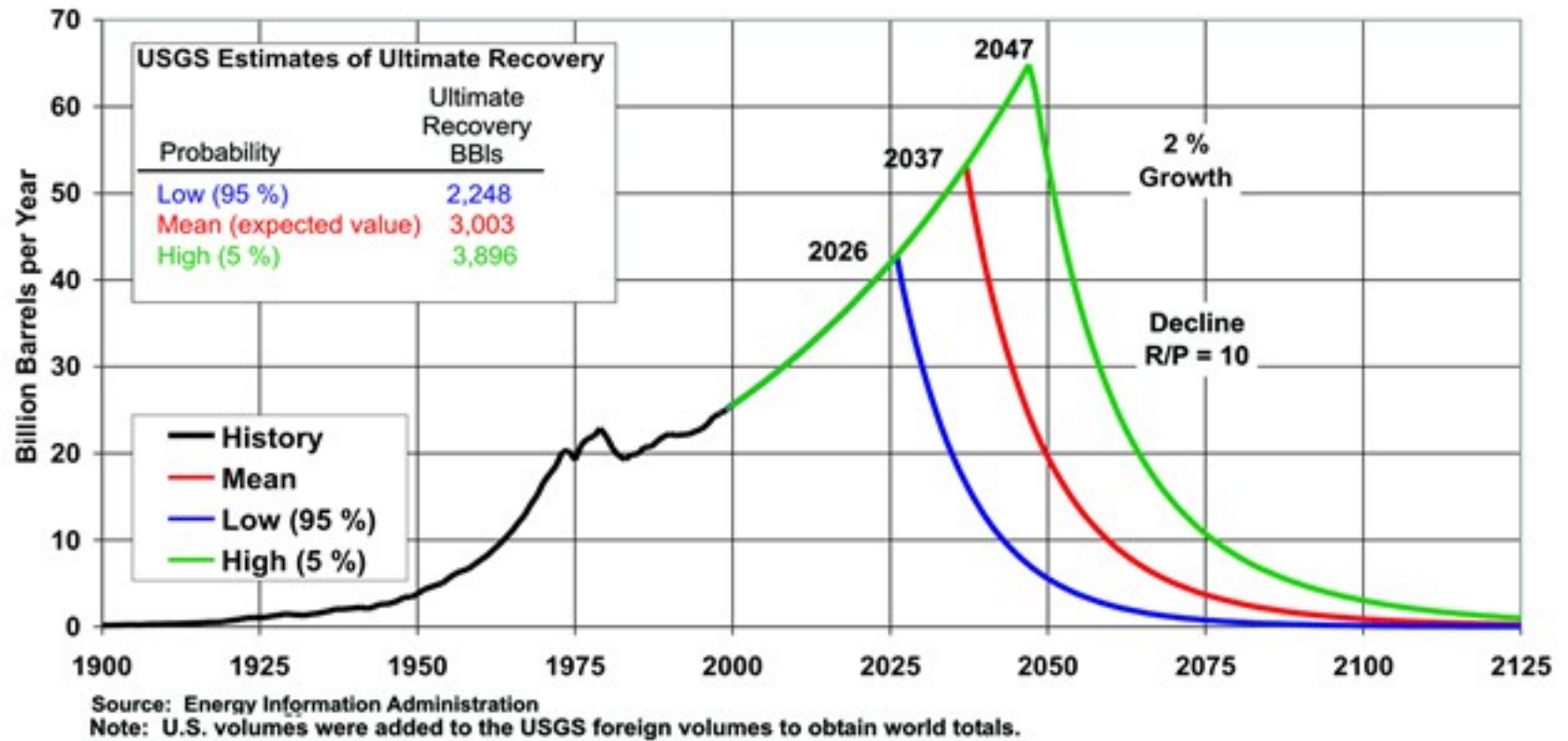


Scenario 3

Traditional models: How?

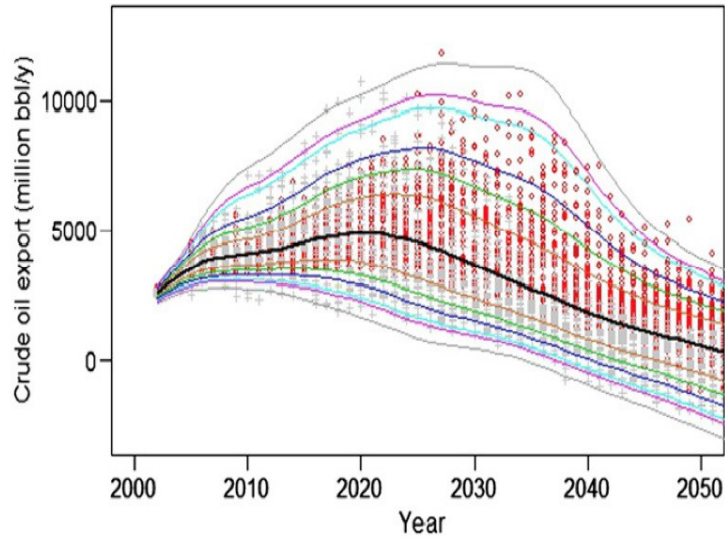


Traditional scenarios

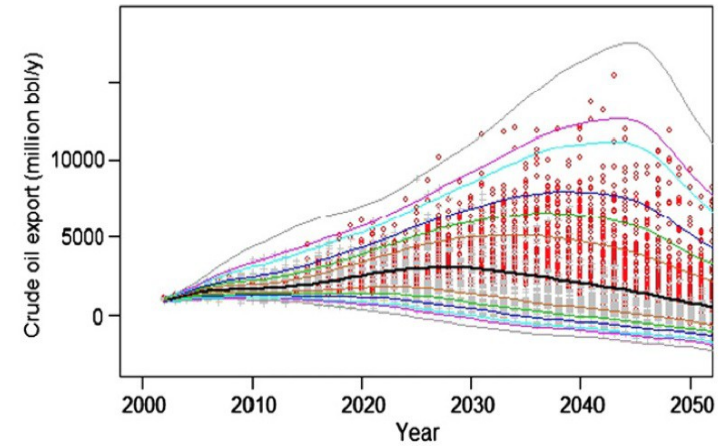


ACEGES-based scenarios of crude oil export capacity for:

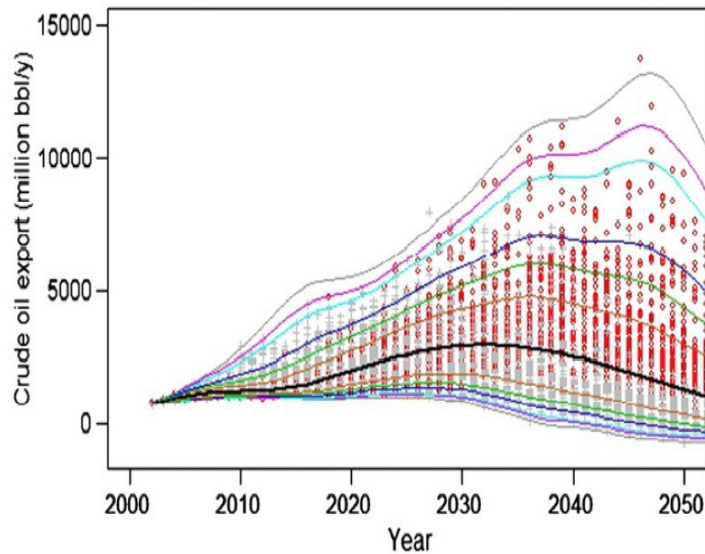
Saudi Arabia



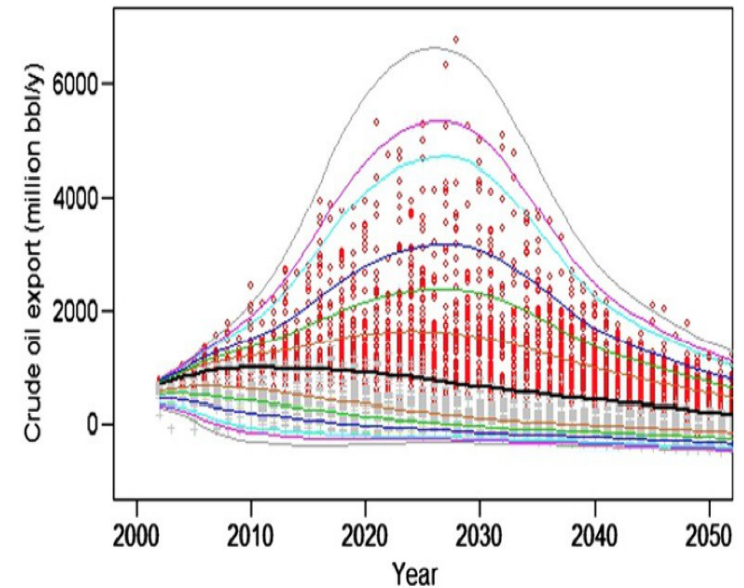
Iran



Iraq



Kuwait



PROBABILISTIC PROJECTIONS OF OIL PRICES

Contributors:

Monthly

Giacomo Scandroglio

Andrea Gori

Emiliano Vaccaro

Antonio Cau

Vlasios Voudouris

Daily

Kostas Andriosopoulos (ESCP Europe)

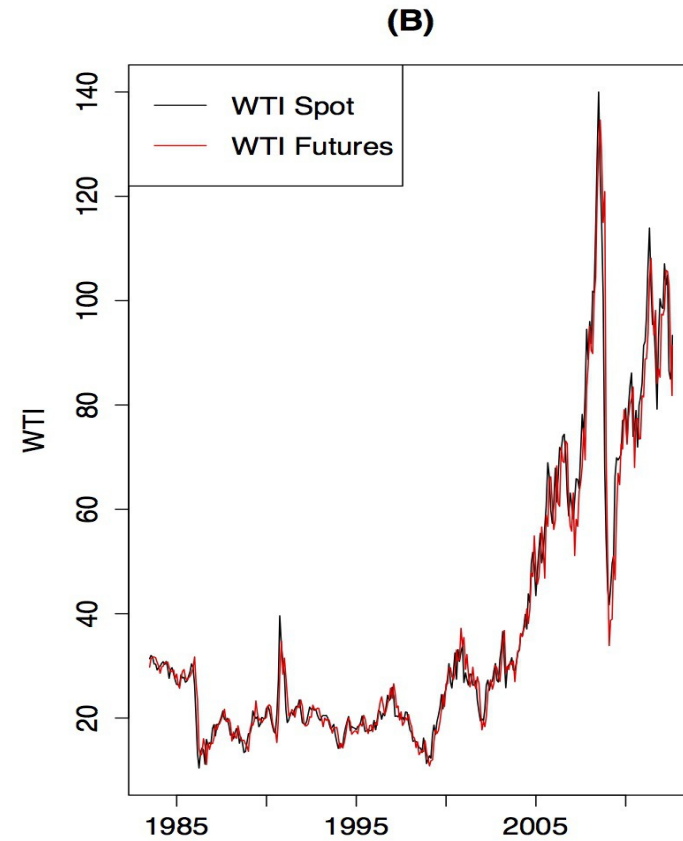
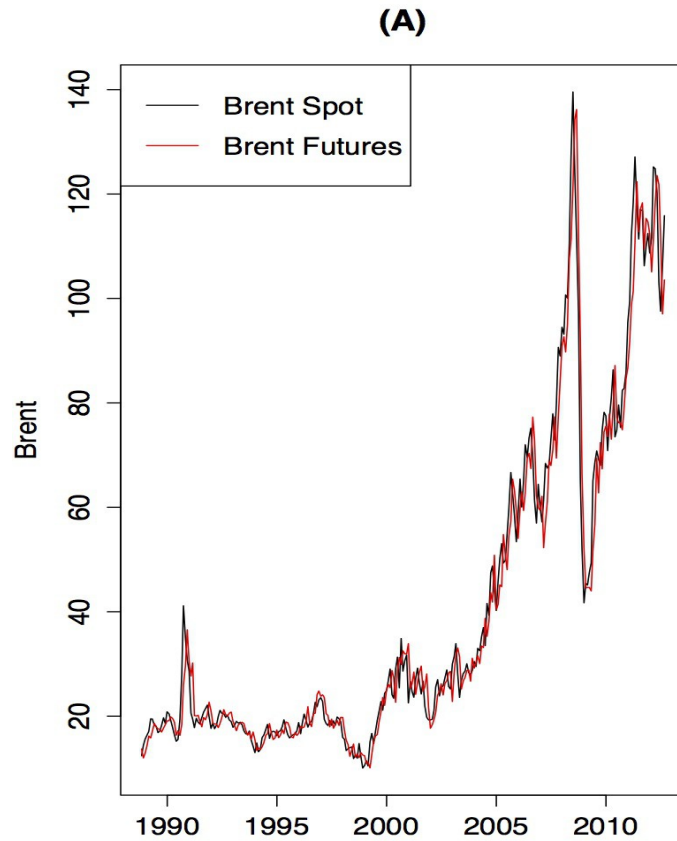
Mikis Stasinopoulos

Bob Rigby

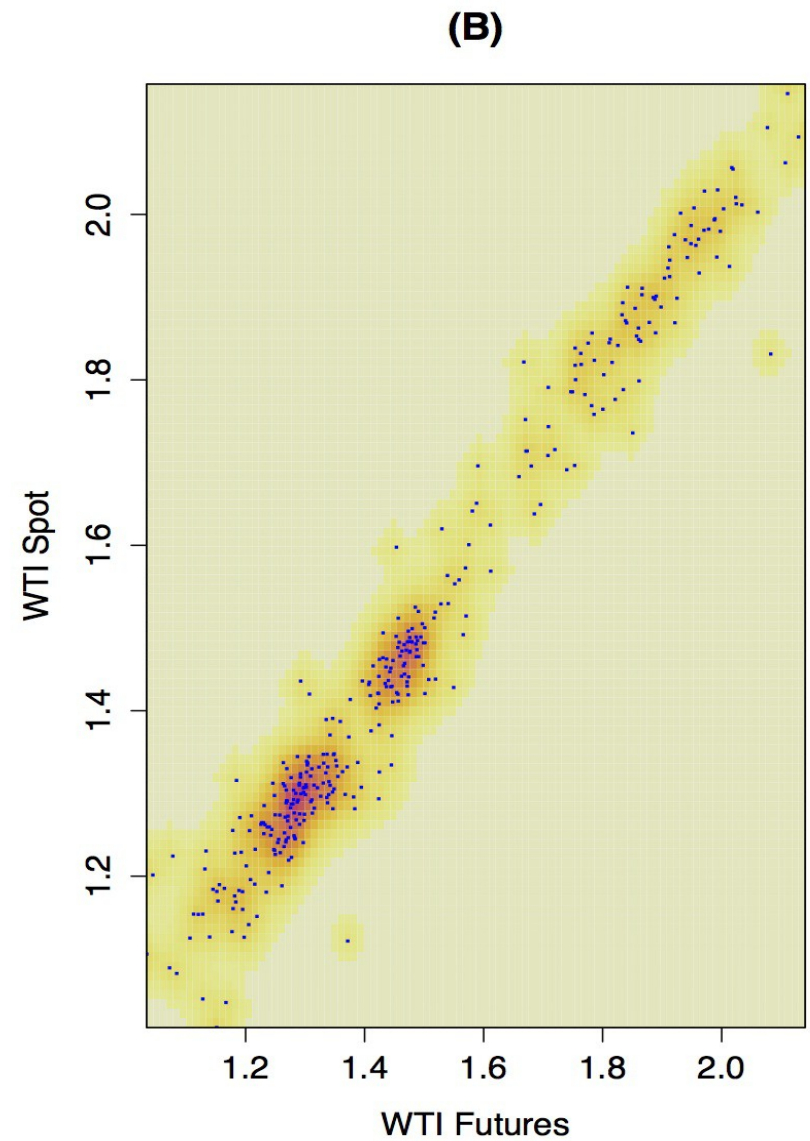
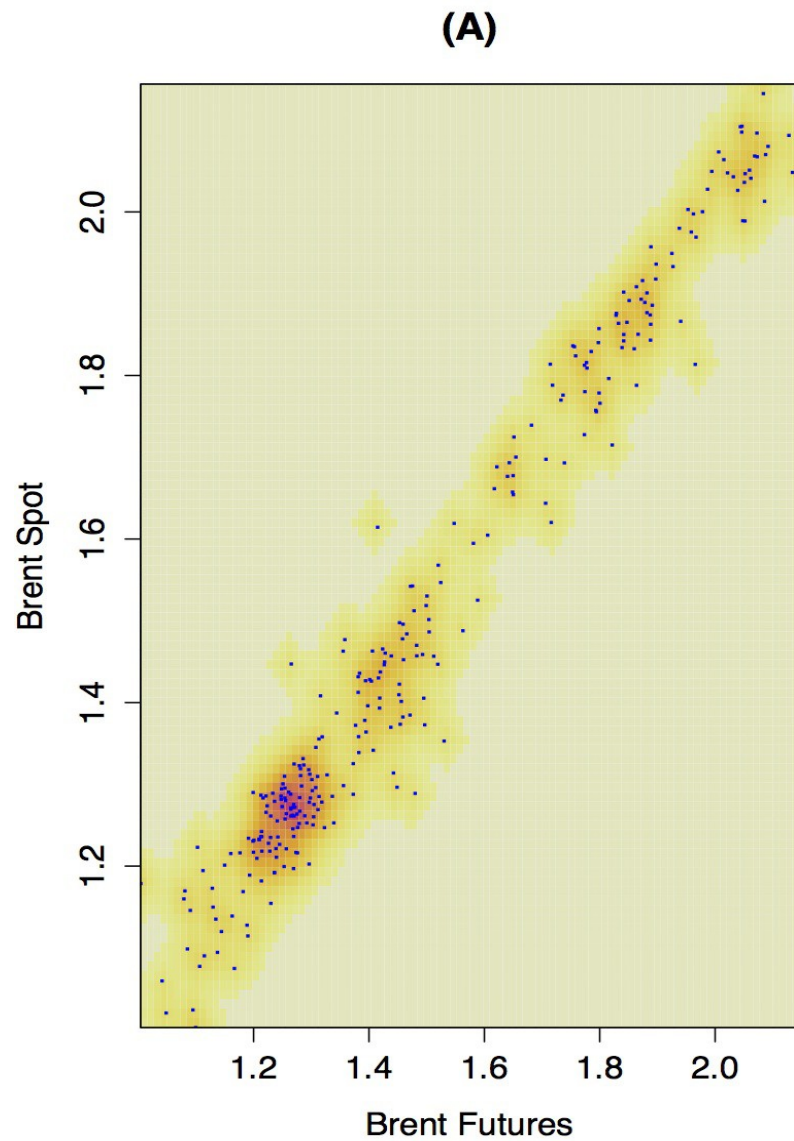
Konstantinos Skindilias

Vlasios Voudouris

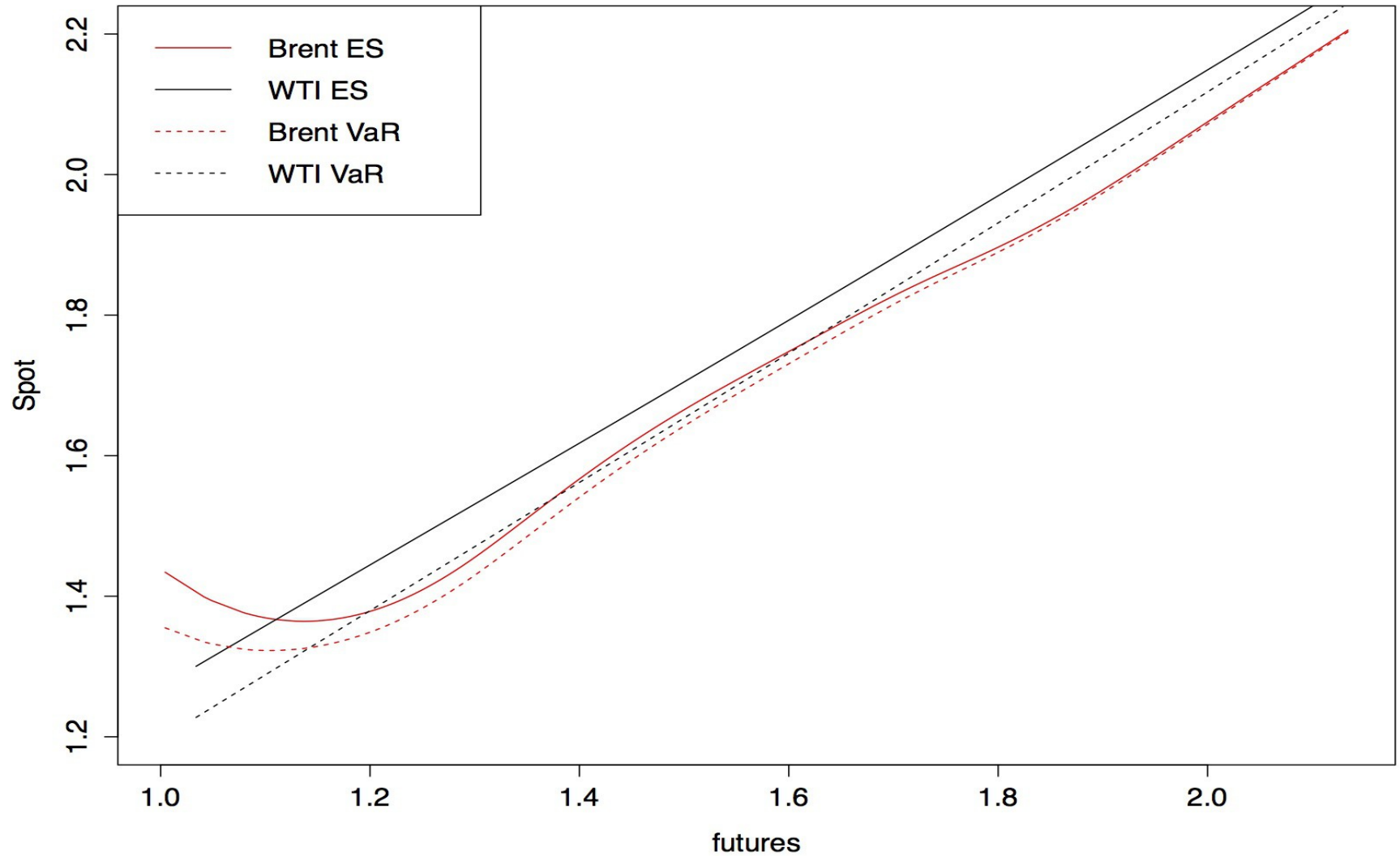
The Pythia of the Brent and WTI spot price of oil?



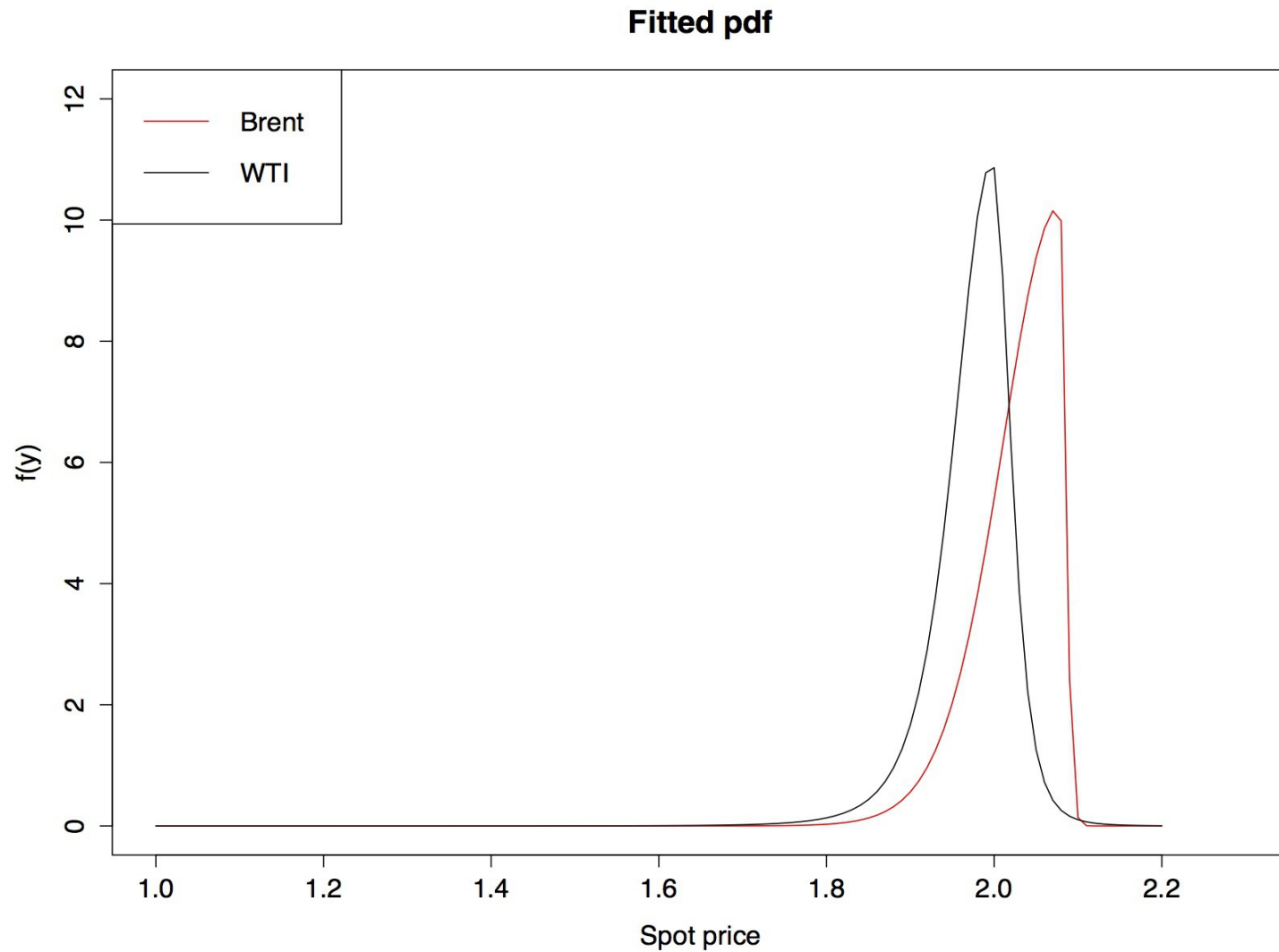
The Pythia of the Brent and WTI spot price of oil?



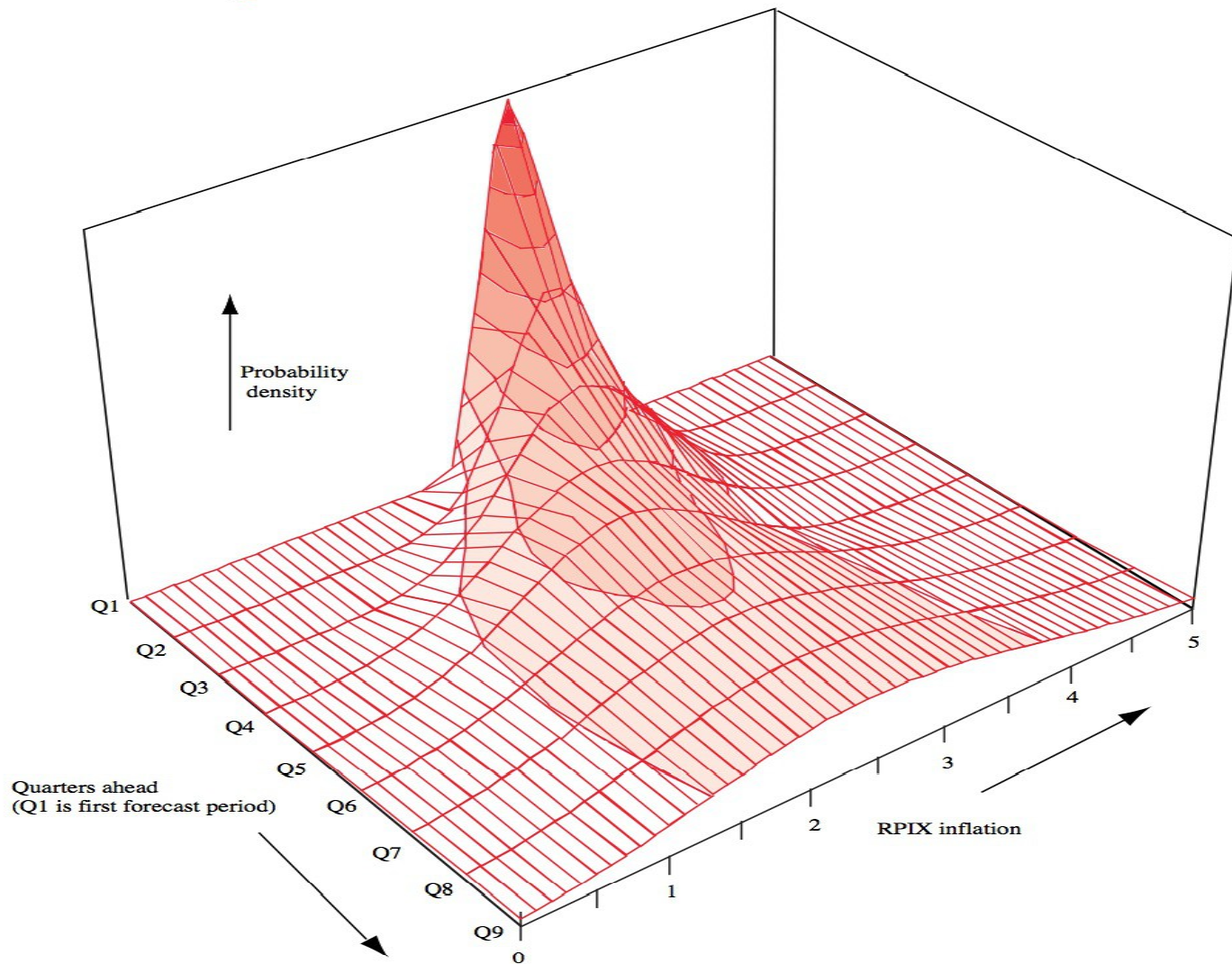
Risk measures for Brent and WTI with futures-varying centiles



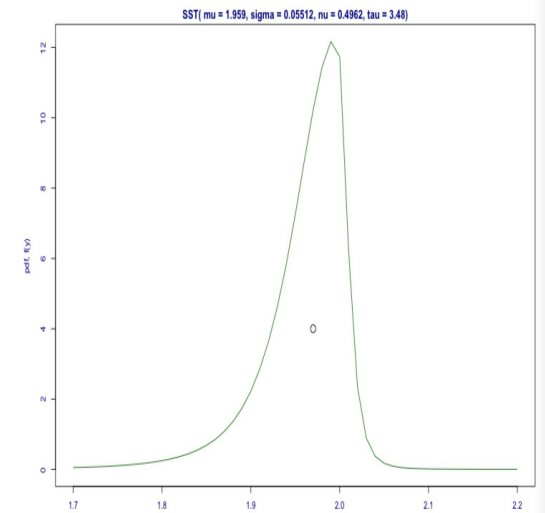
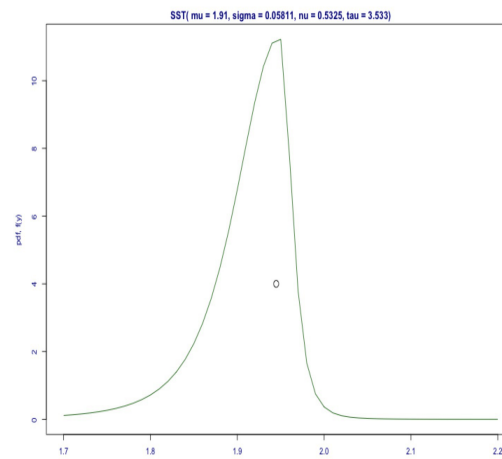
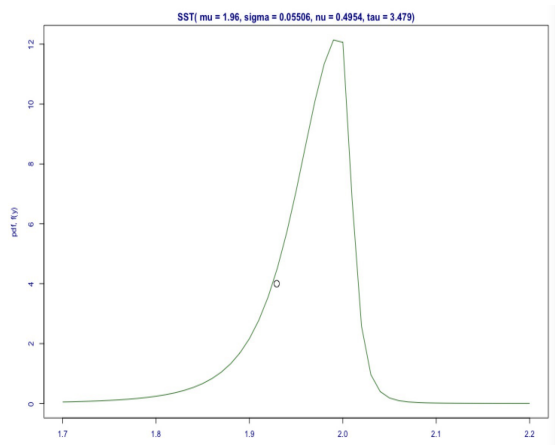
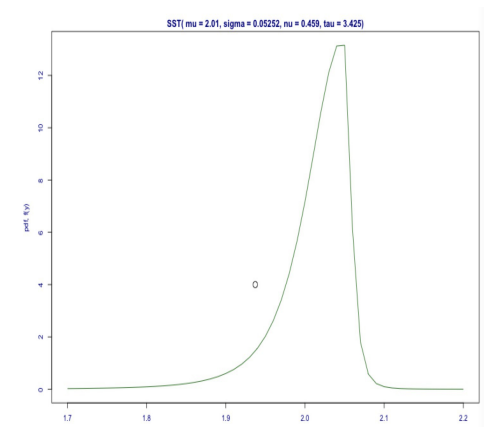
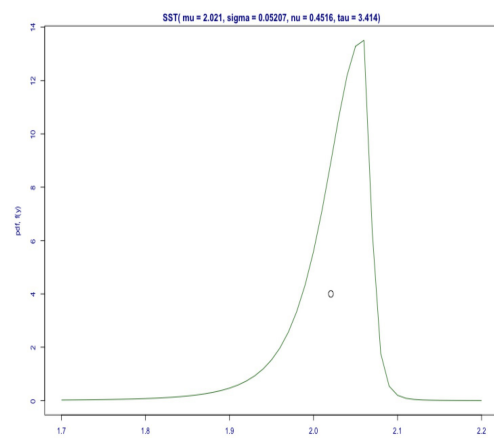
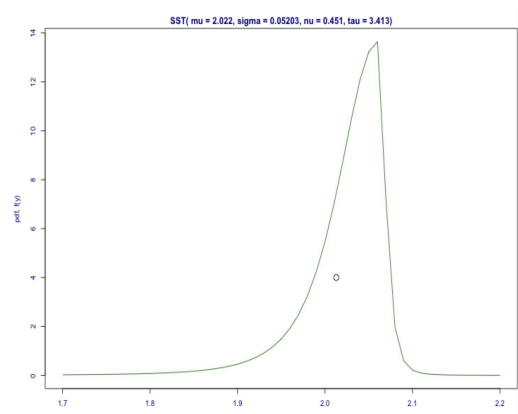
Brent and WTI pdfs



Supporting central banks by providing them with probabilistic projections of oil prices



... probabilistic forecasts (from April to August, 2012)



GAMLSS

Contributors:

Mikis Stasinopoulos

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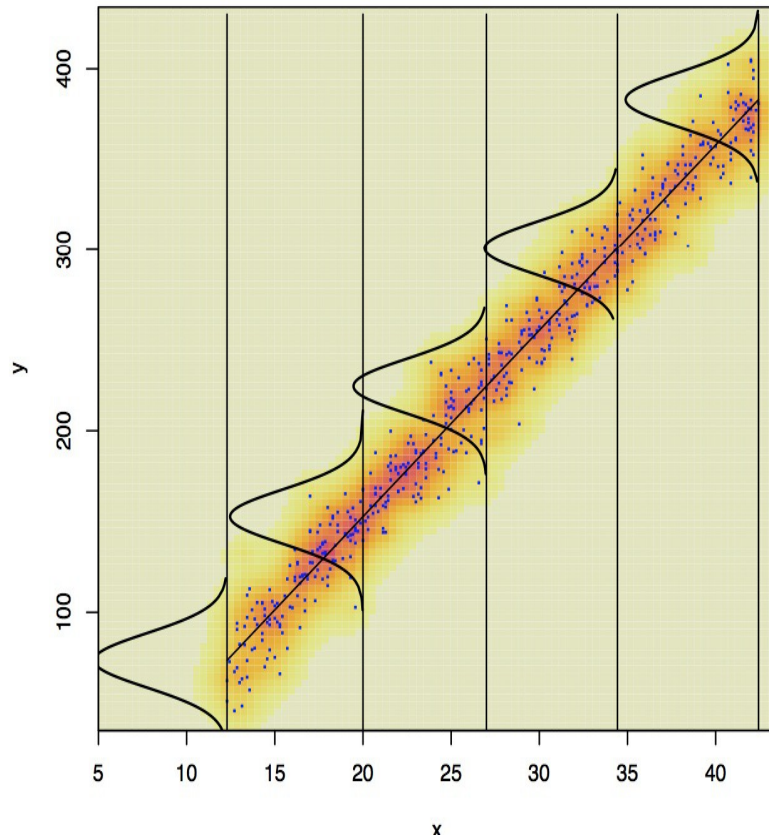
Paul Eilers (Erasmus University, Netherlands)

Majid Djennad

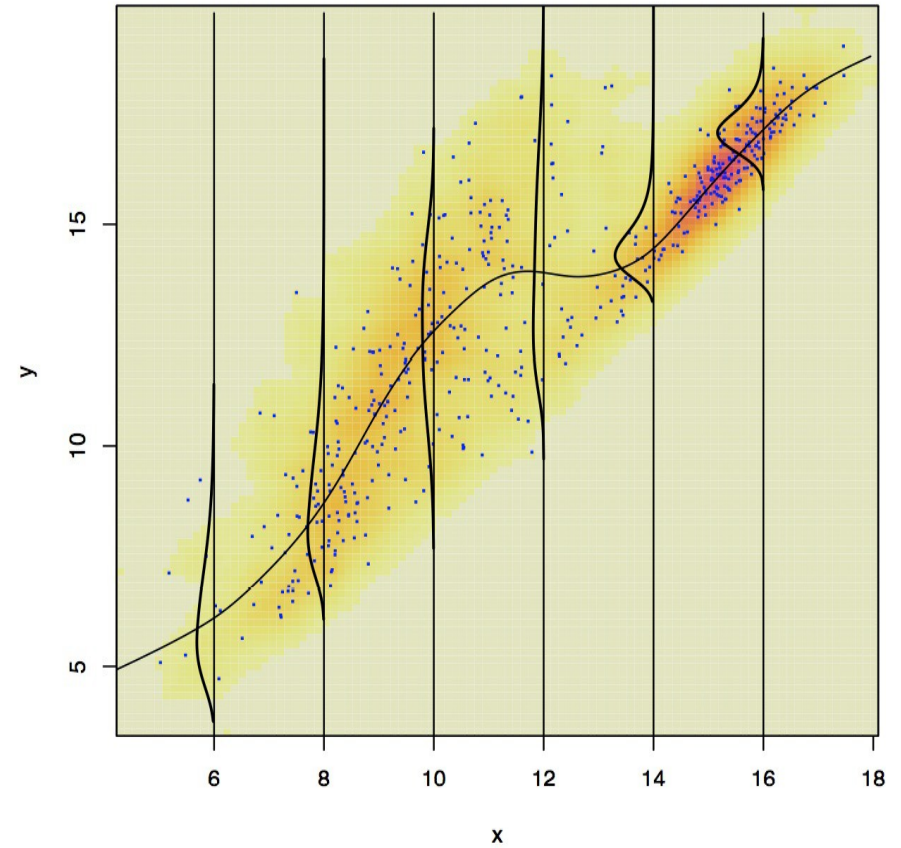
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GAMLSS – novel regression framework when life is not '**normal**'

Simple Regression



GAMLSS



GEST
(work in progress)

Contributors:

Majid Djennad

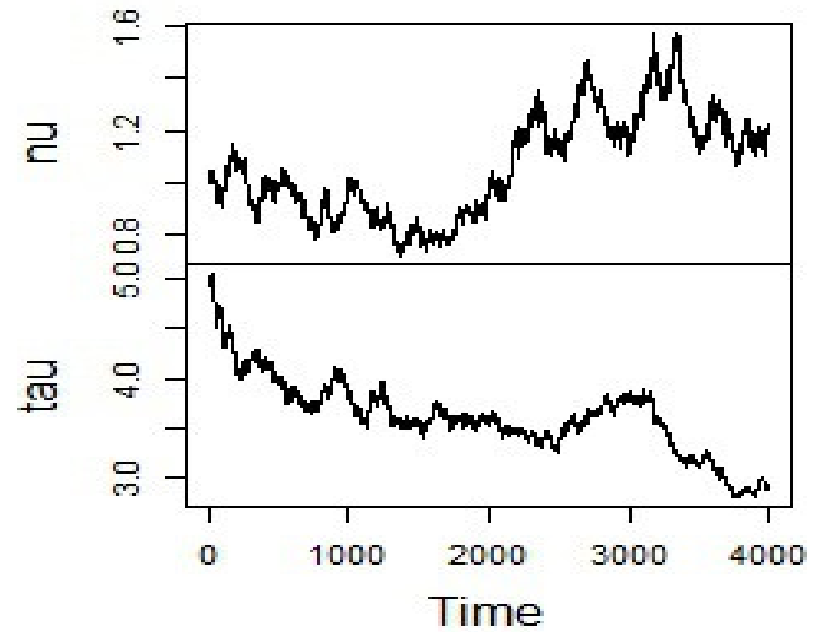
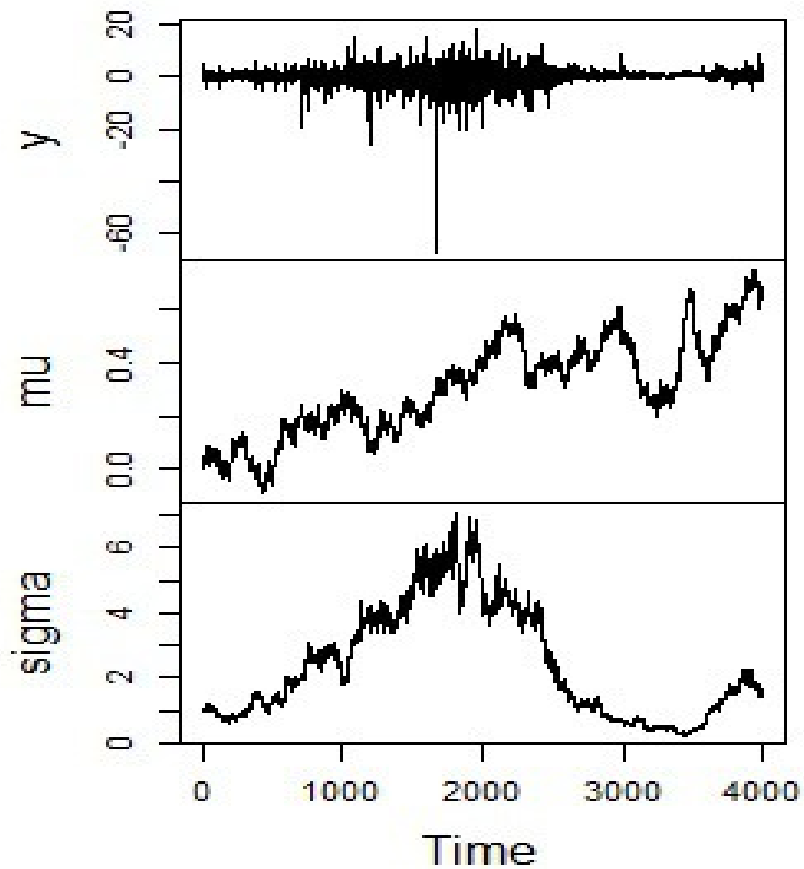
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GEST – when 'black swans' are part of reality



STRATEGIC RISKS

Contributors:

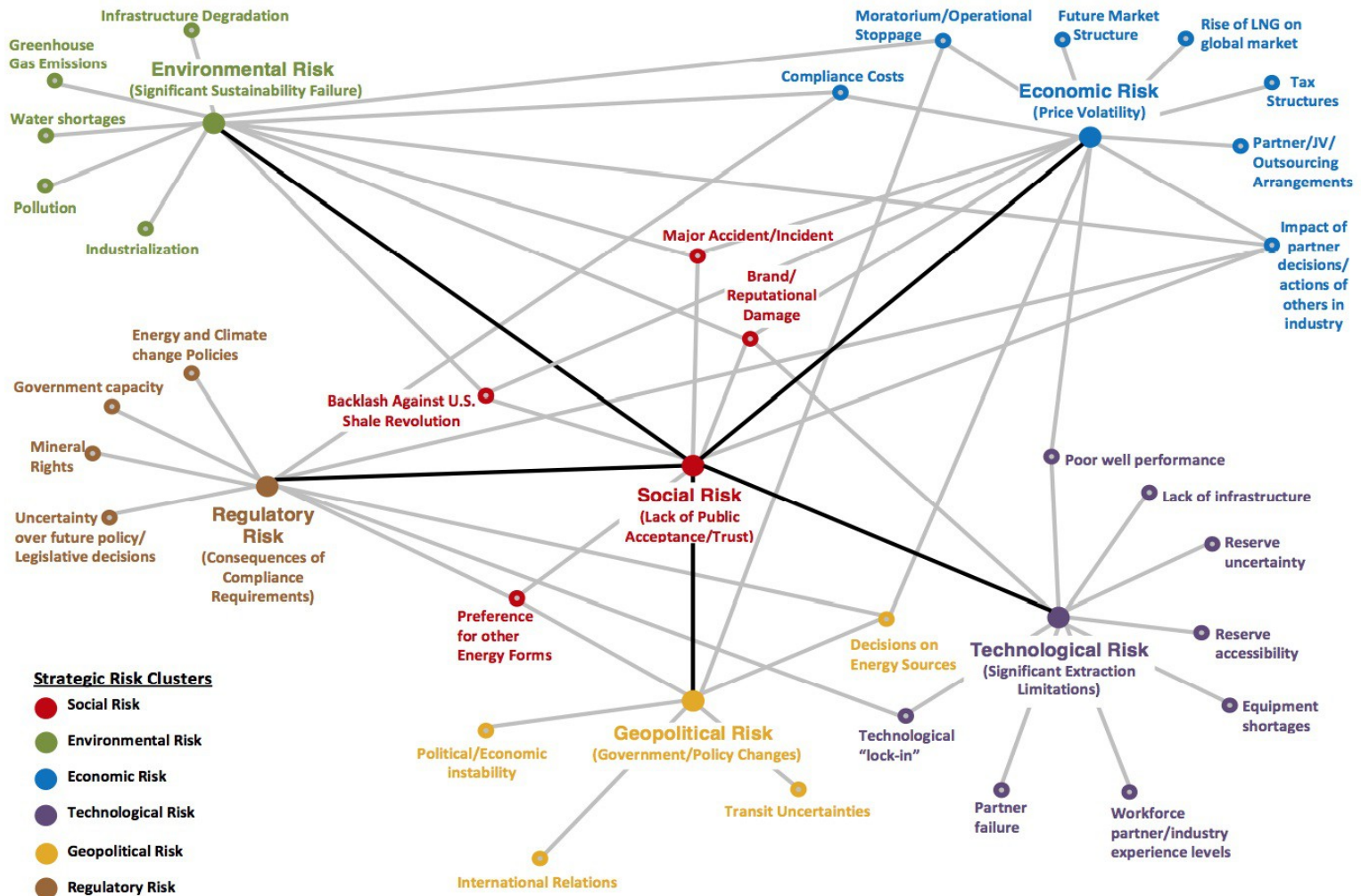
Jim Seaton

Lucie Roux

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European shale gas



ACEWEM
(work in progress)

Contributors:

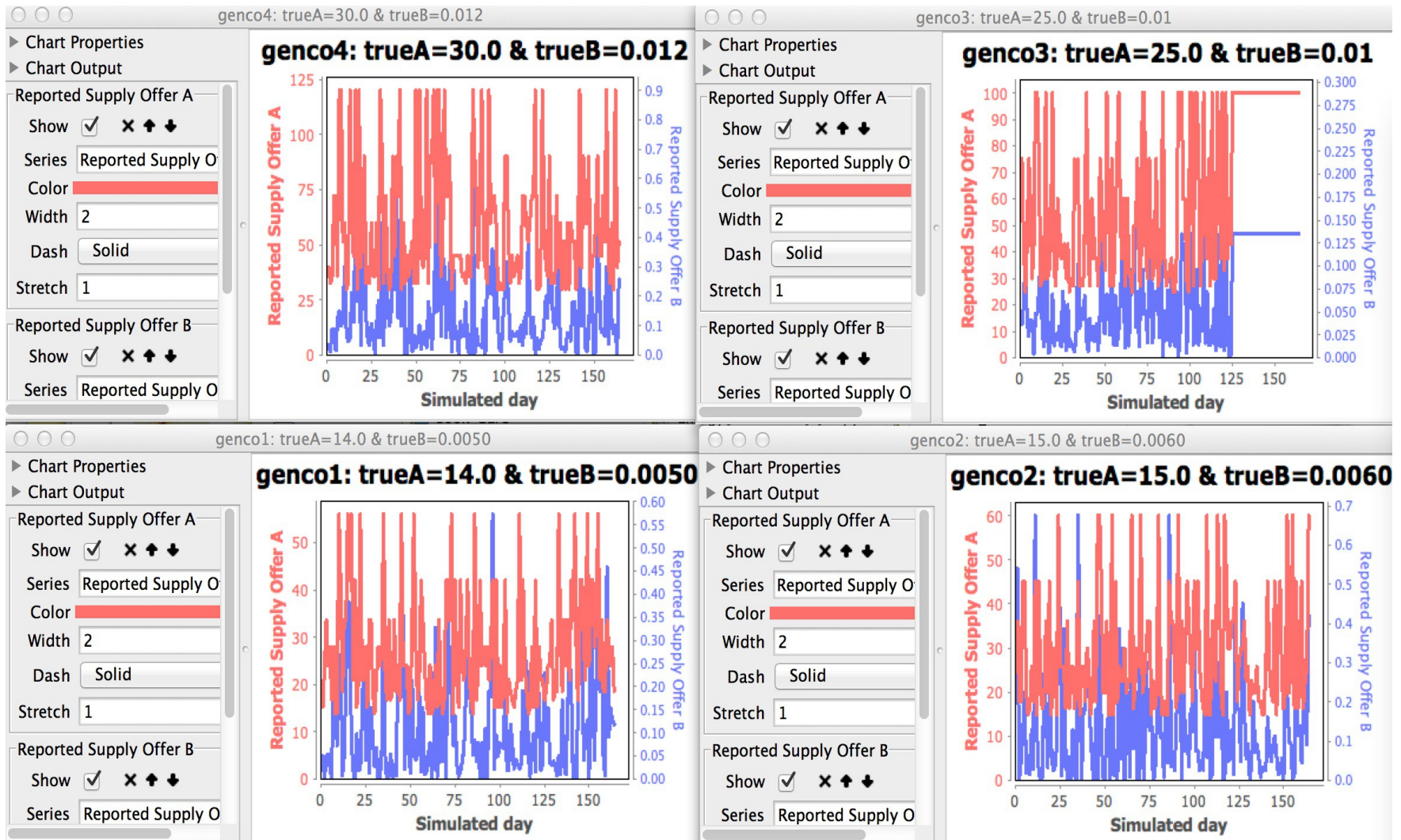
Daniil Kiose

Mikis Stasinopoulos

Konstantinos Skindilias

Vlasios voudouris

ACEWEM – Agent-based model for wholesale electricity markets



WHY MODEL?

Because by joining forces, CIBS & RCEM:

- Can **bound** outcomes to plausible ranges
- Can **illuminate** core dynamics
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Thank You

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