Somebody knows something: Oil & Gas Modelling

Dr. Vlasios Voudouris
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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
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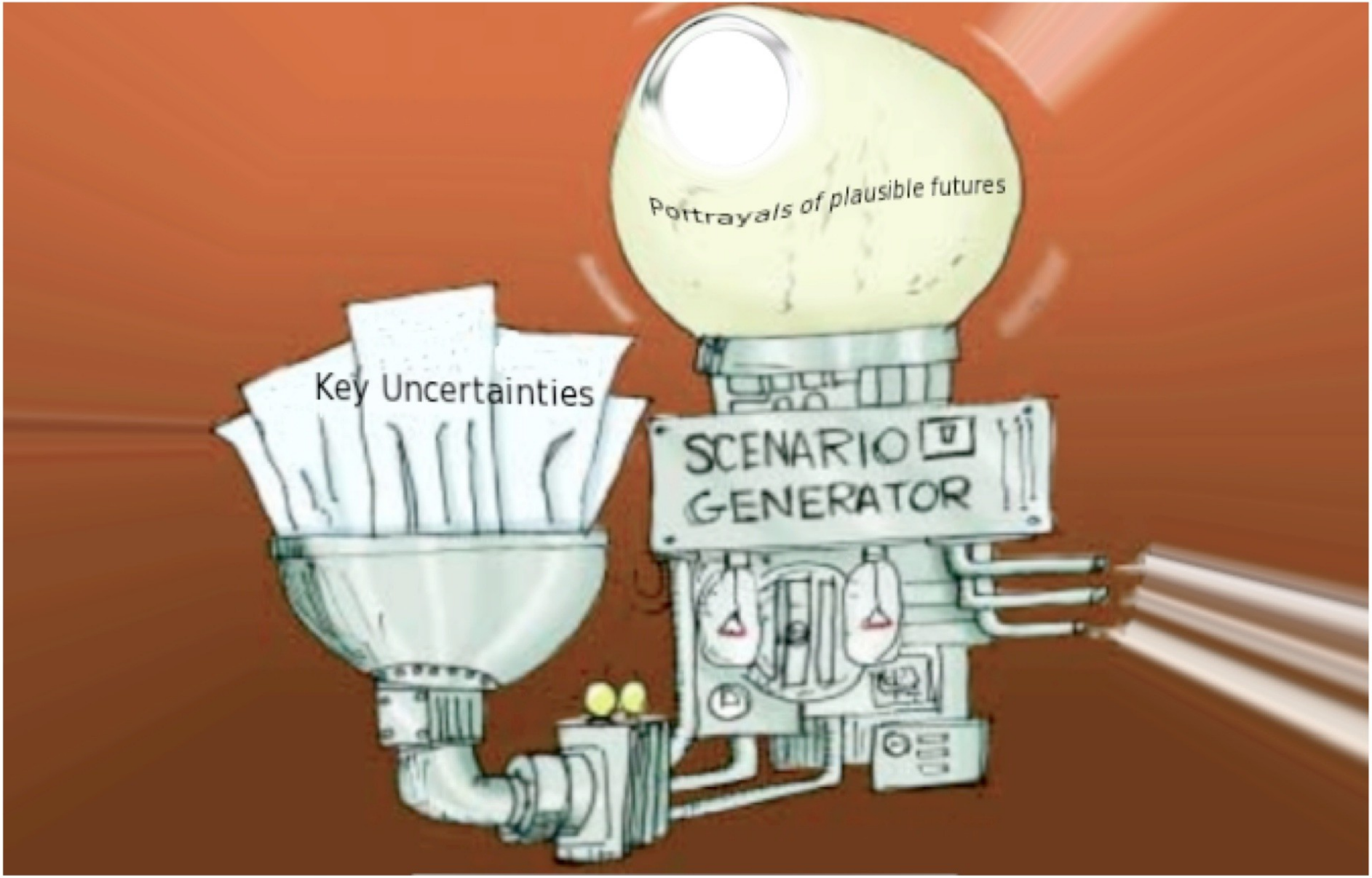
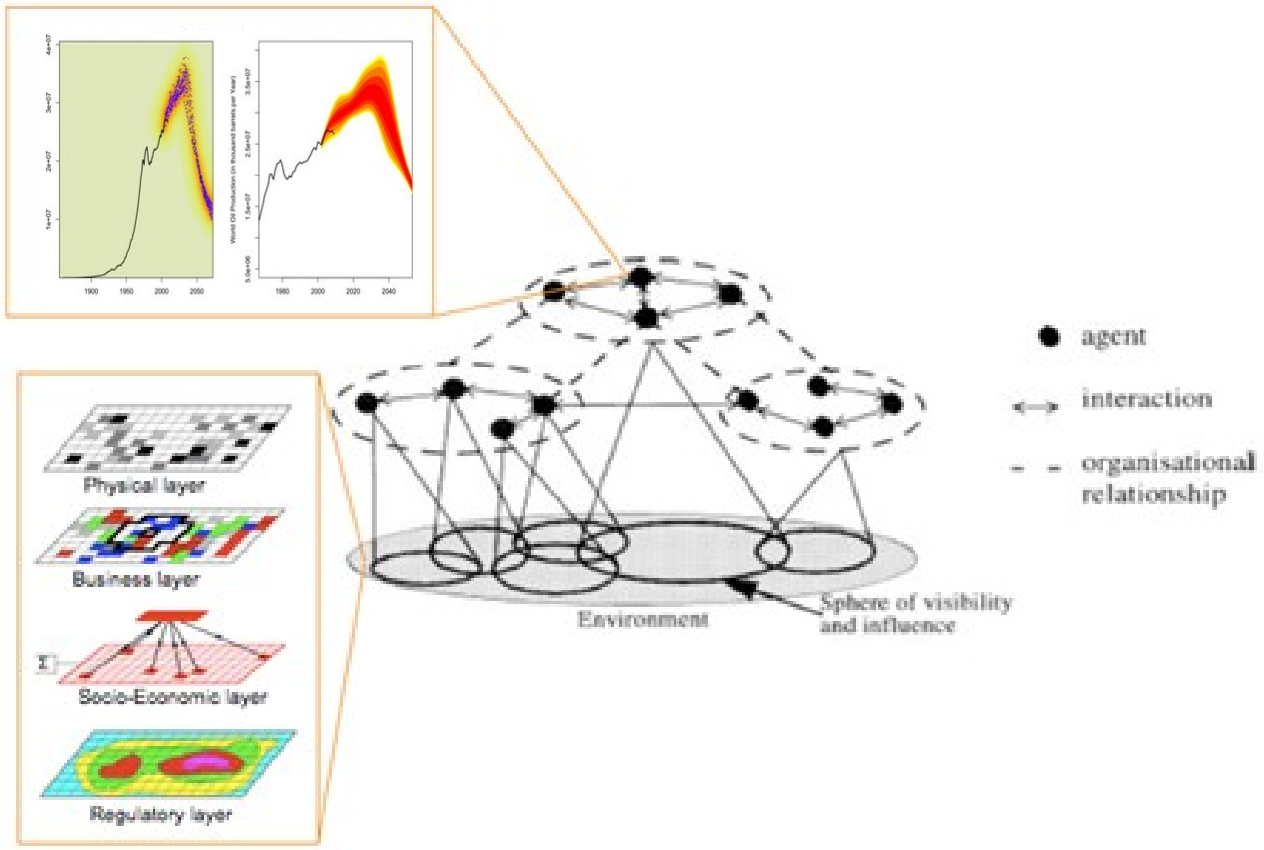
*ACEGES funding by the Japanese Society for the Promotion of Science

The ACEGES model – Concept

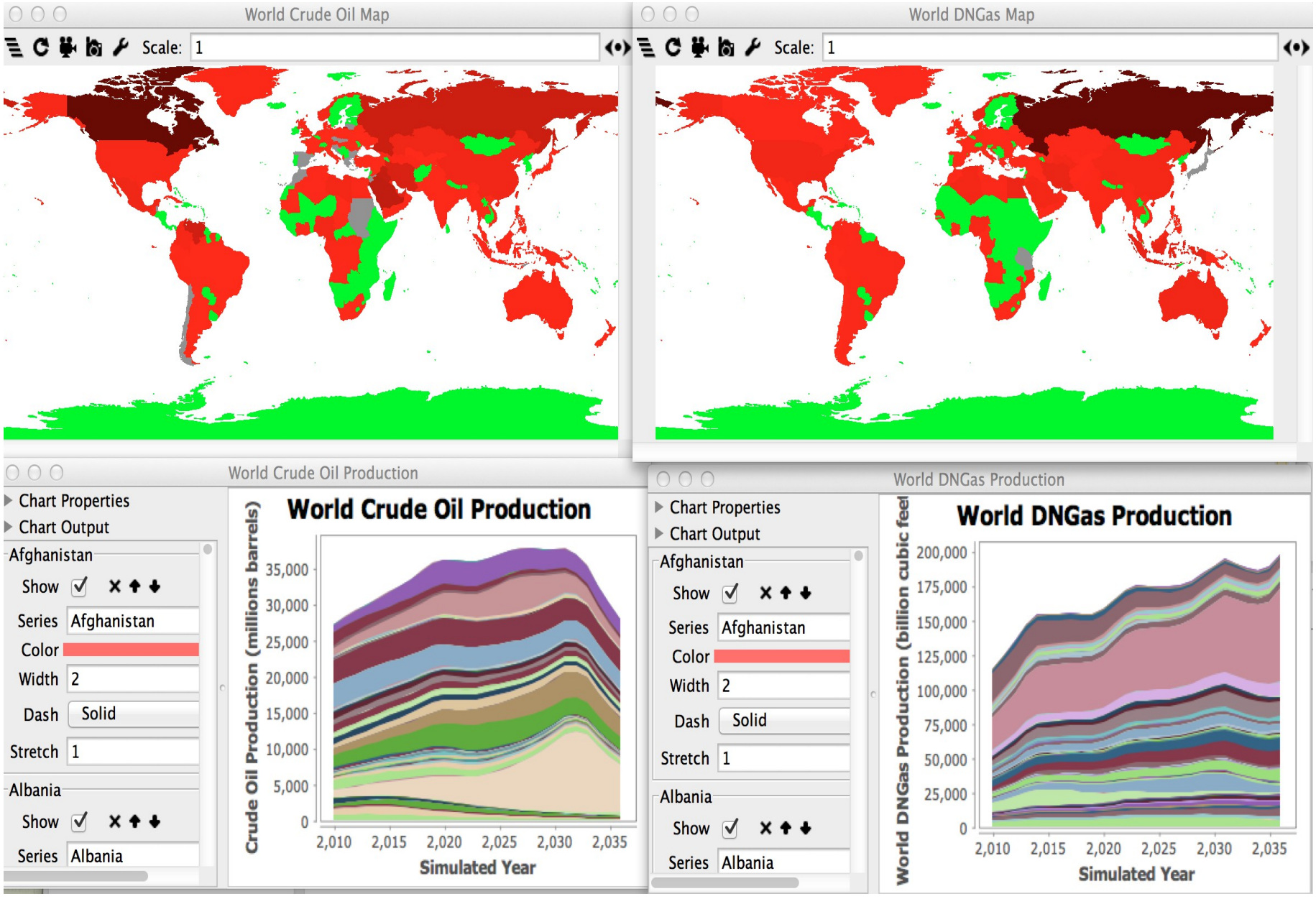


The ACEGES model – The building blocks

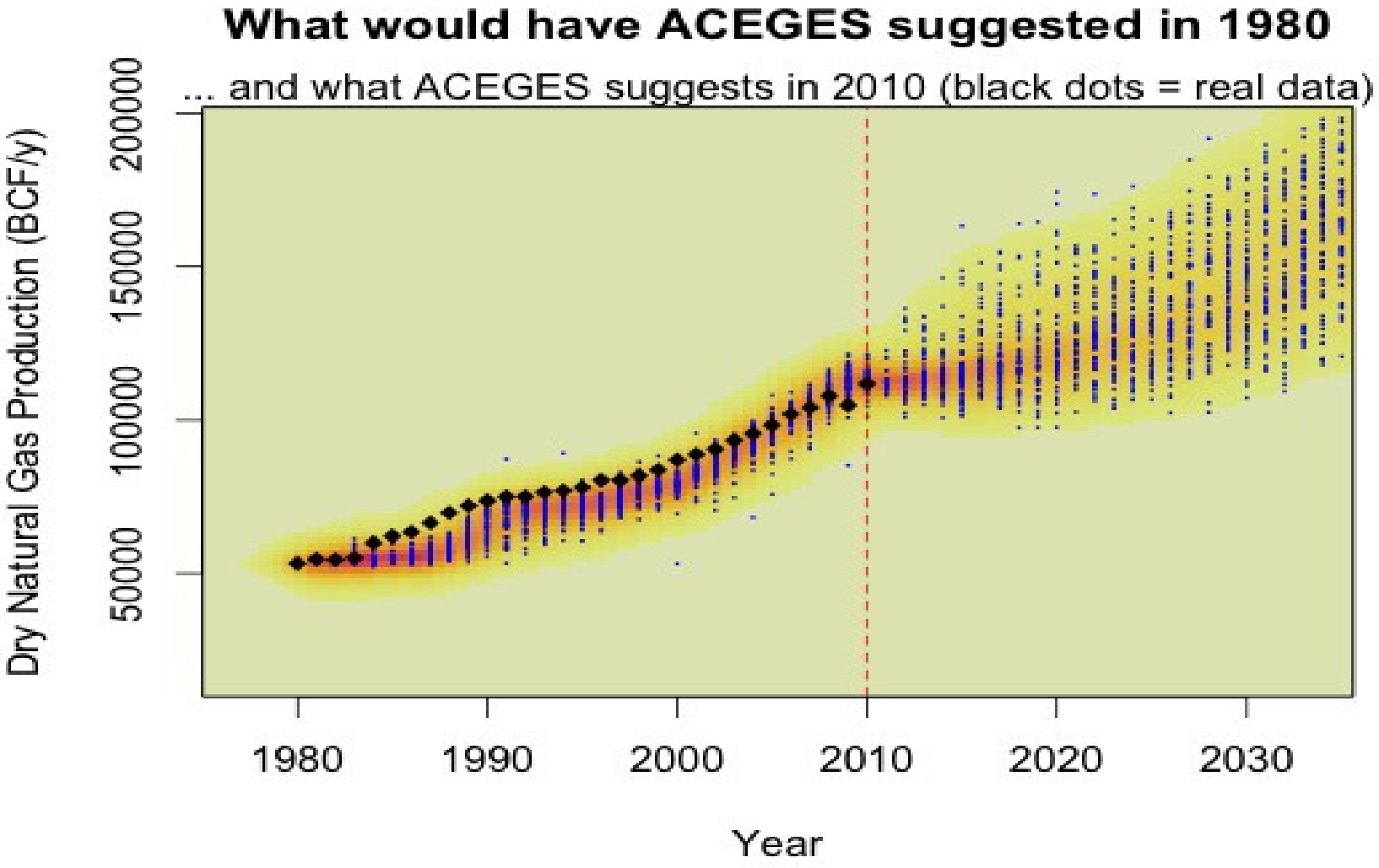


Informed and integrated micro-macro view:
Better exploration of market dynamics and risks

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

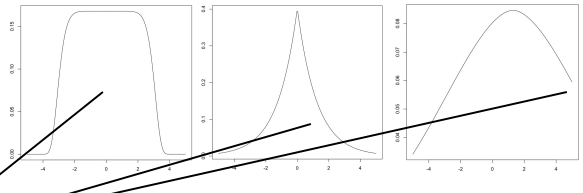


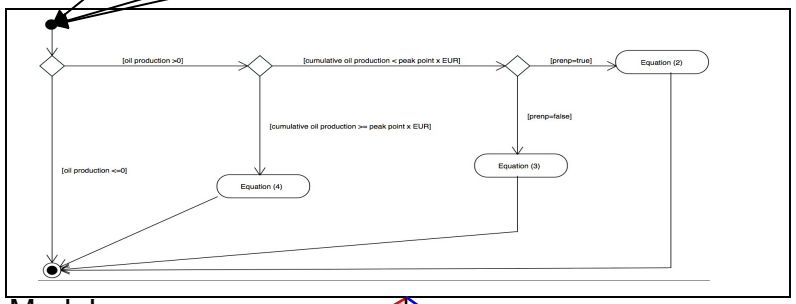
The ACEGES scenarios: An example



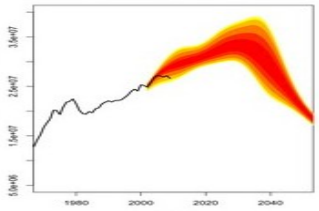
ACEGES-based scenarios : How?

Uncertainties

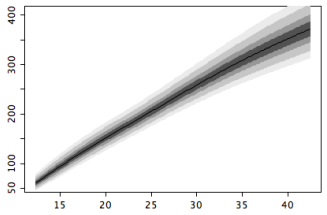




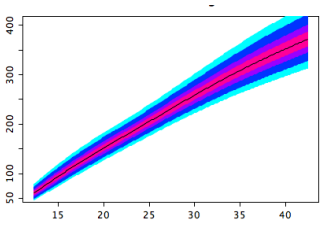
Model



Scenario 1

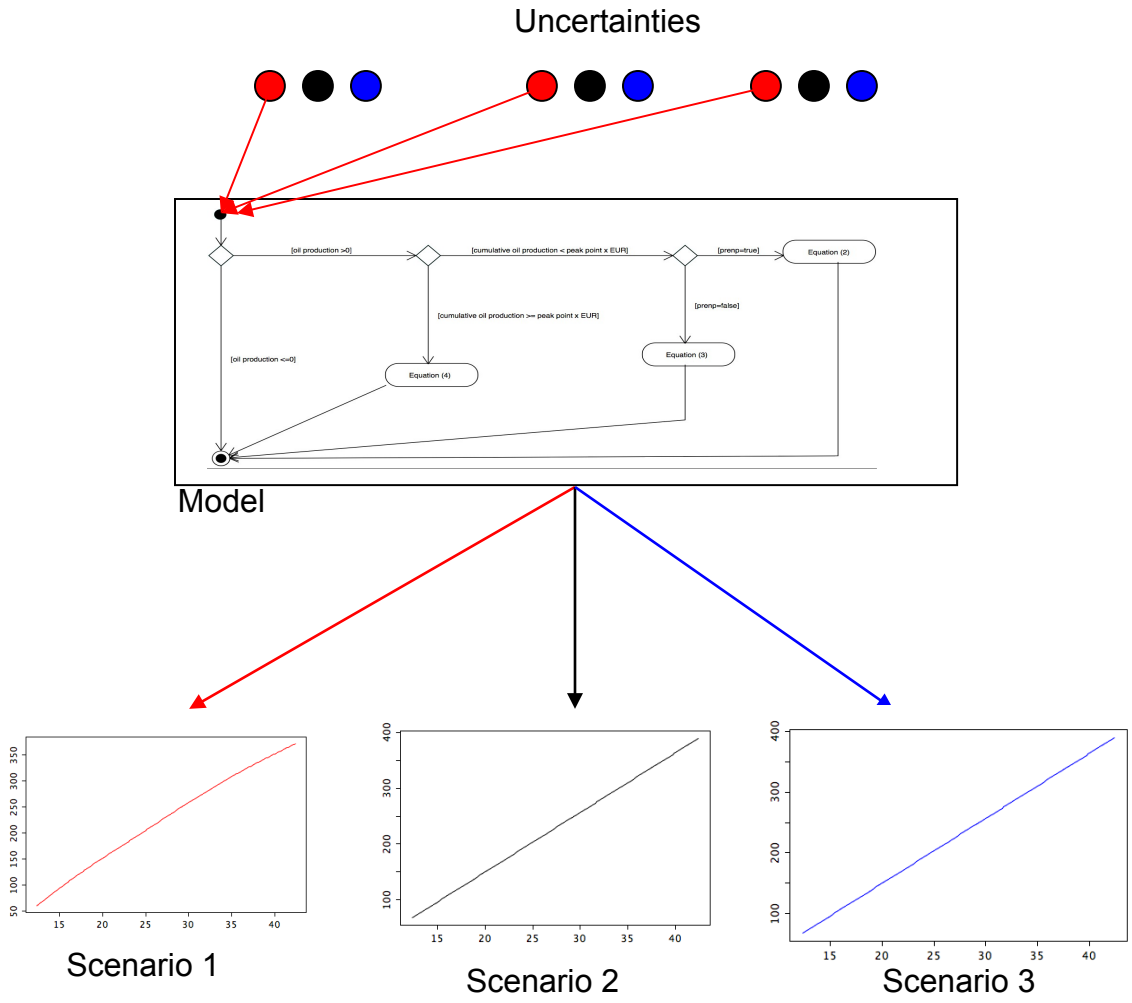


Scenario 2

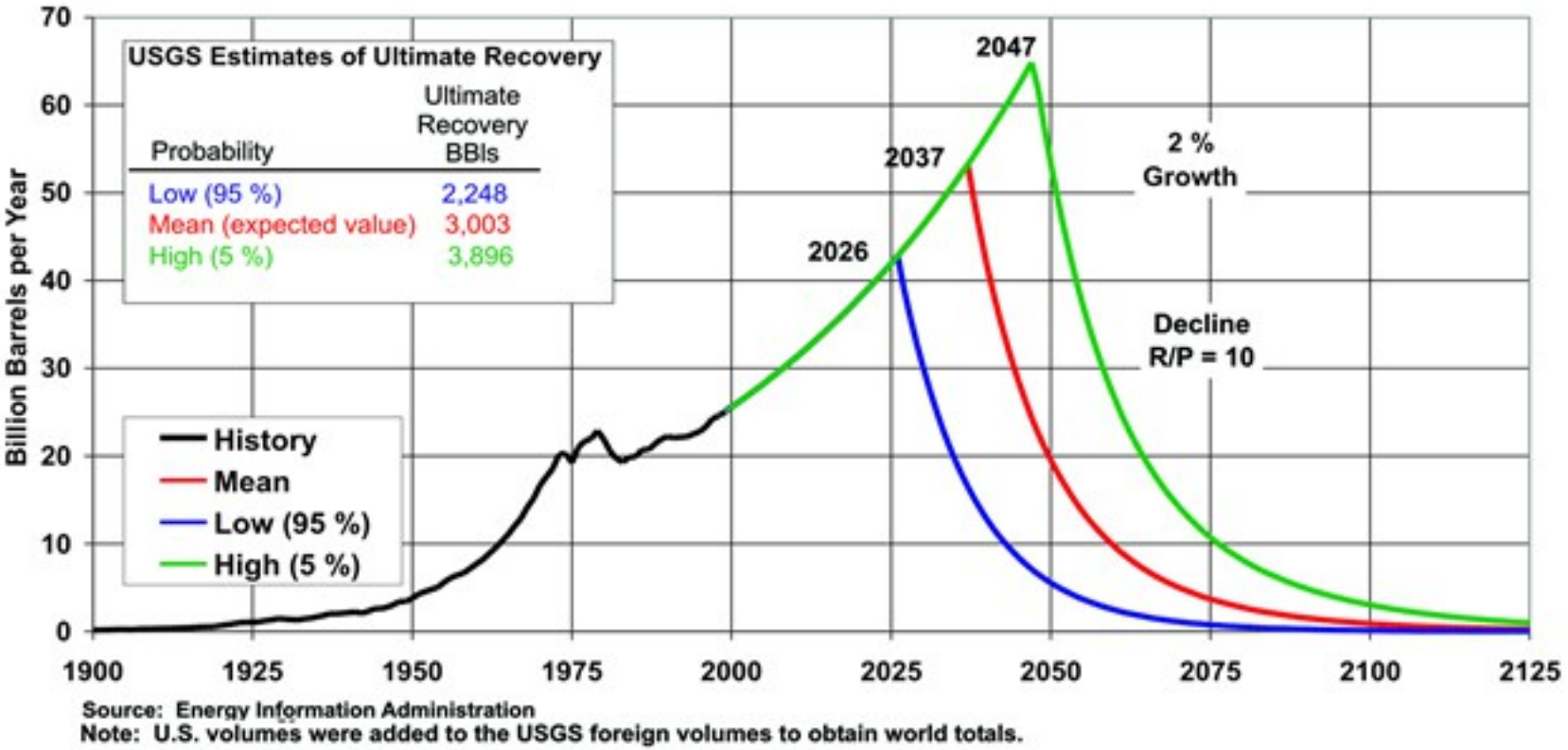


Scenario 3

Traditional models: How?



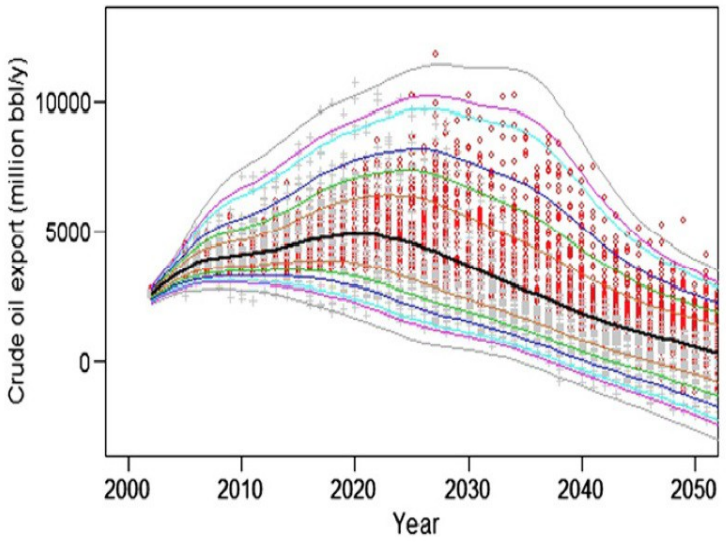
Traditional scenarios



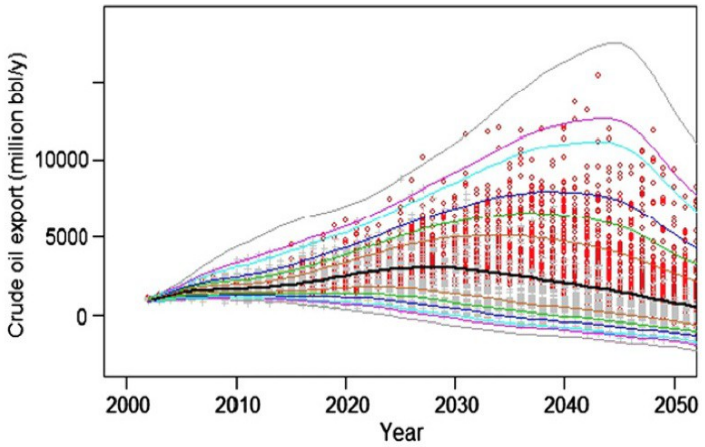
Source: Energy Information Administration
Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

ACEGES-based scenarios of crude oil export capacity for:

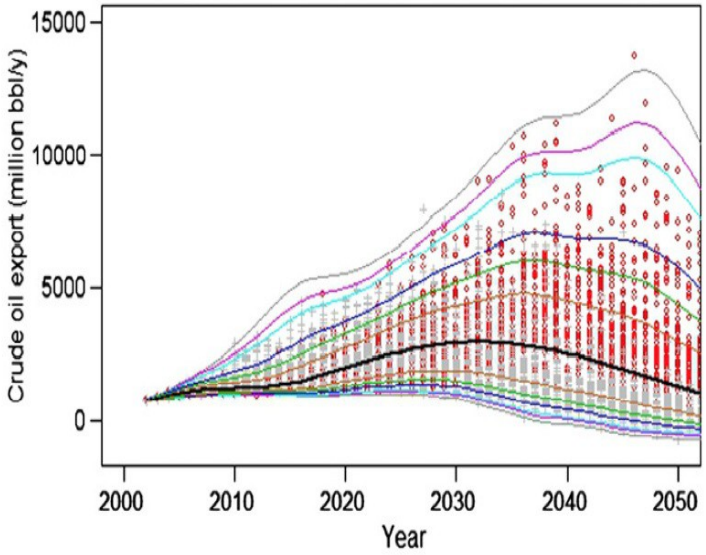
Saudi Arabia



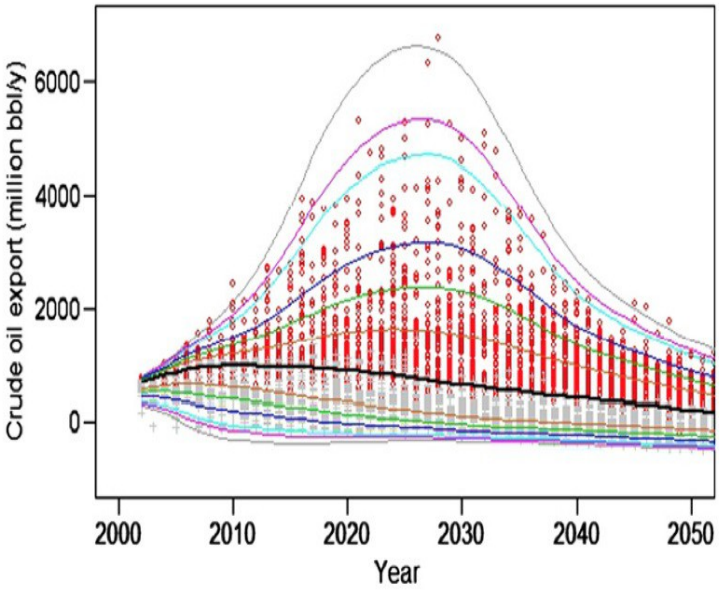
Iran



Iraq



Kuwait



PROBABILISTIC PROJECTIONS OF OIL PRICES

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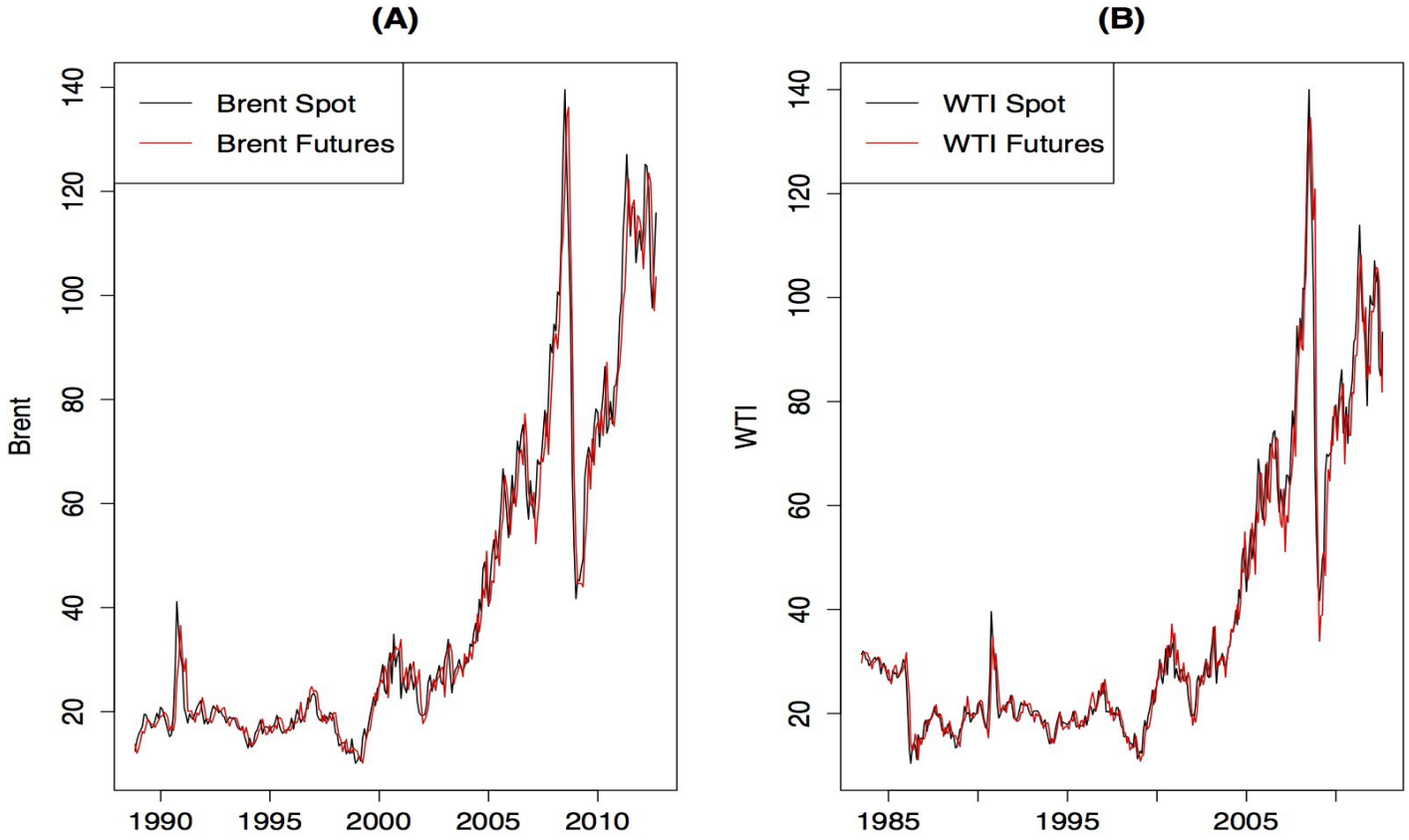
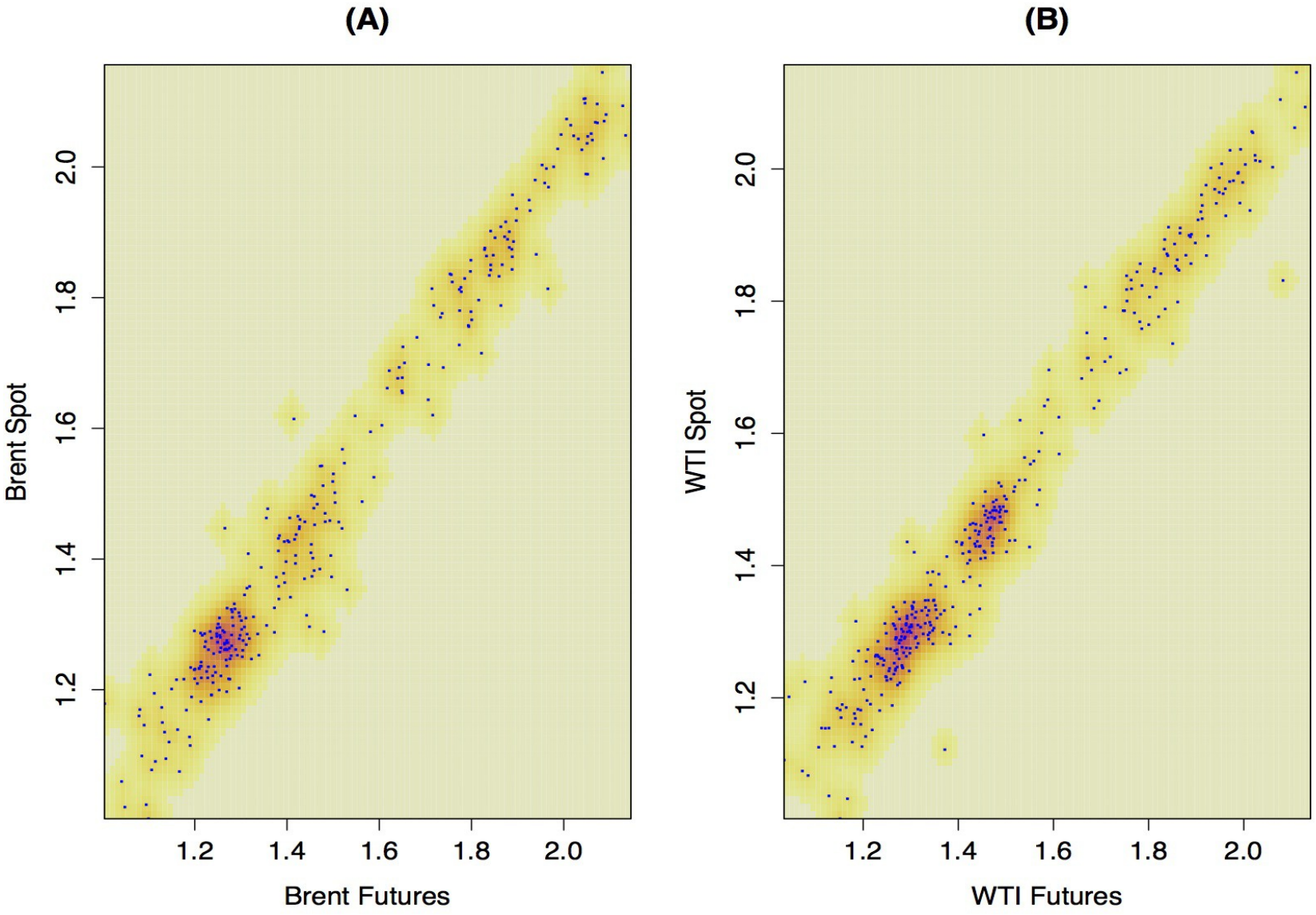
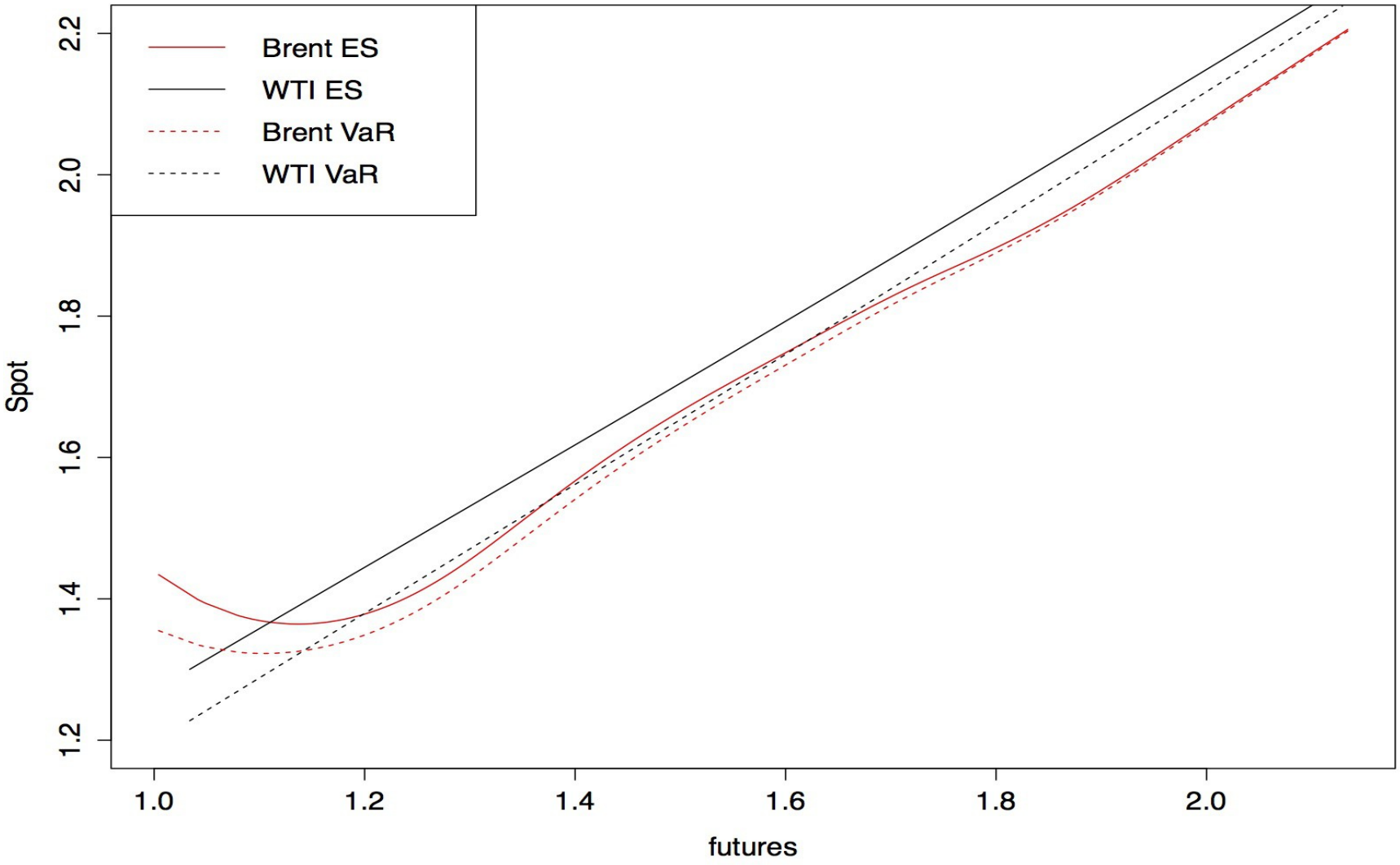
The Pythia of the Brent and WTI spot price of oil?



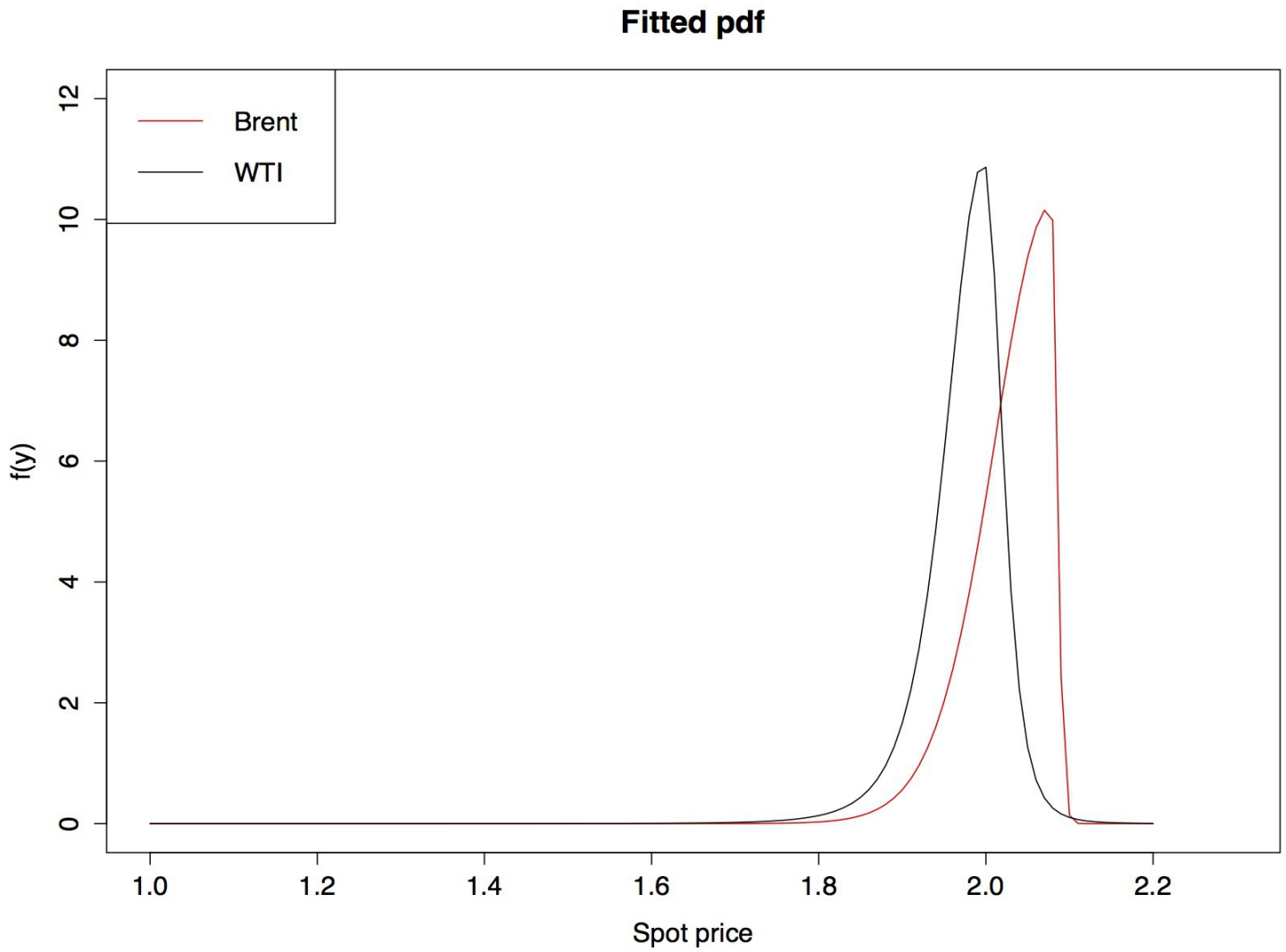
The Pythia of the Brent and WTI spot price of oil?



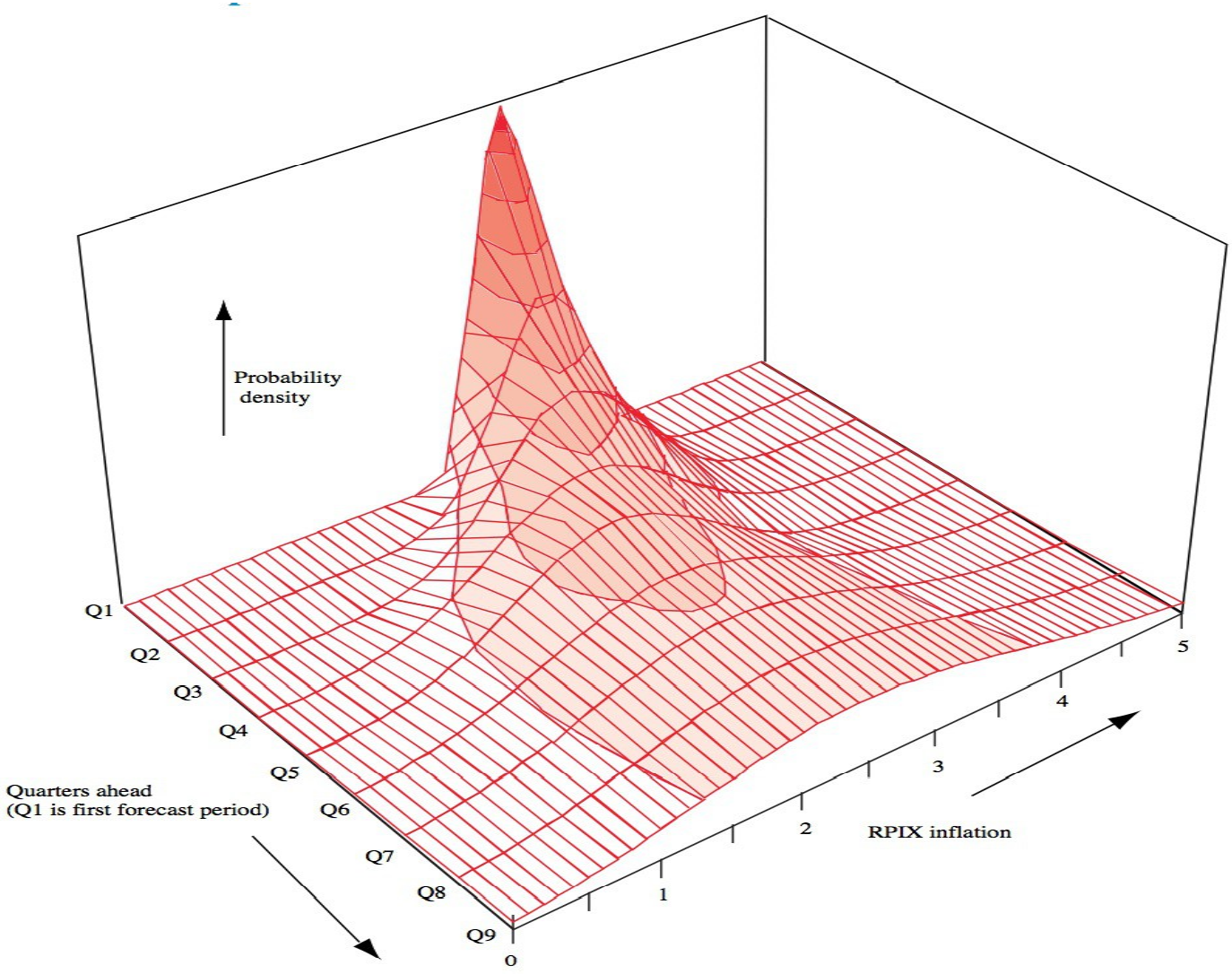
Risk measures for Brent and WTI with futures-varying centiles



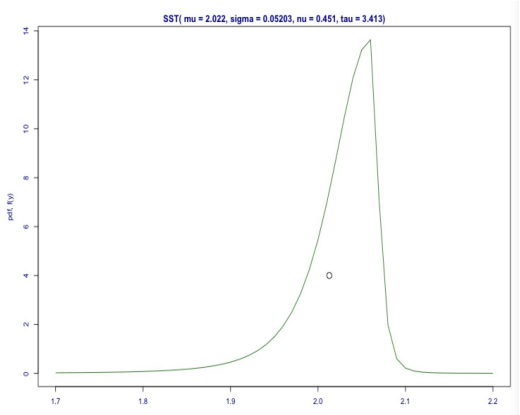
Brent and WTI pdfs

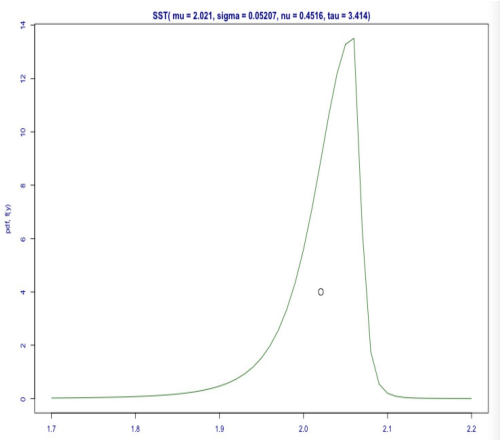


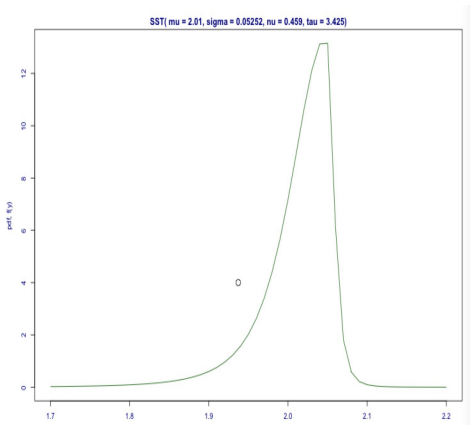
Supporting central banks by providing them with probabilitistic projections of oil prices

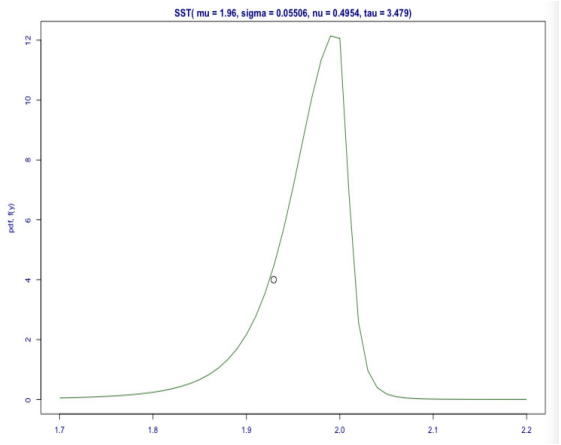


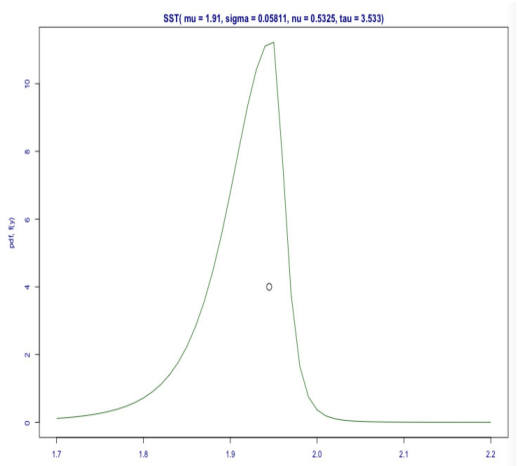
… probabilistic forecasts (from April to August, 2012)

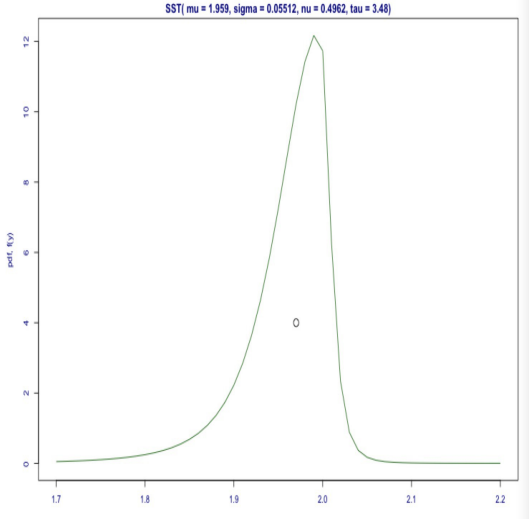












GAMLSS

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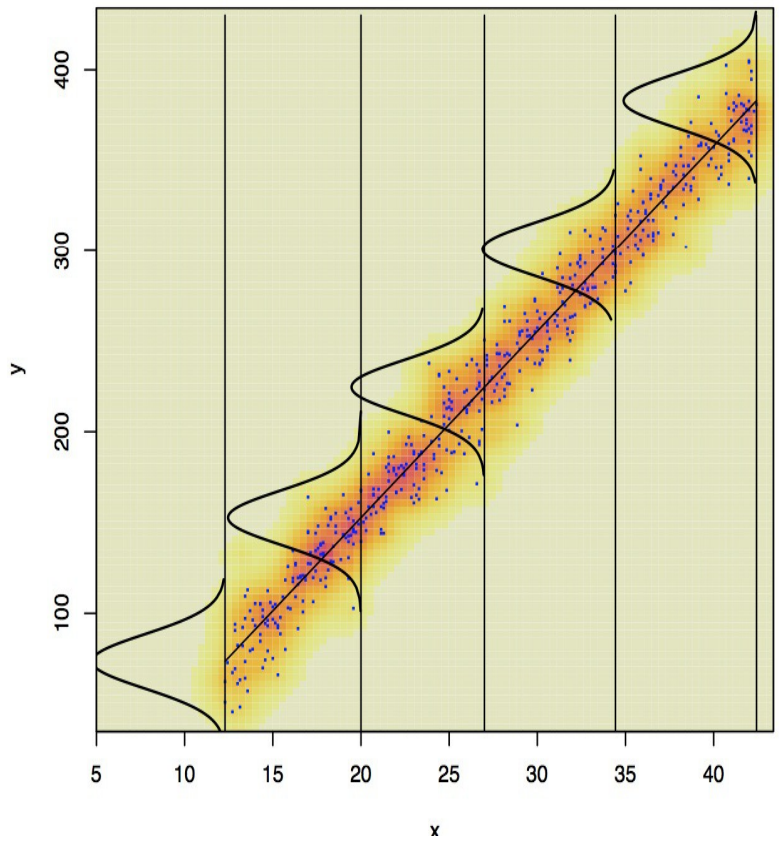
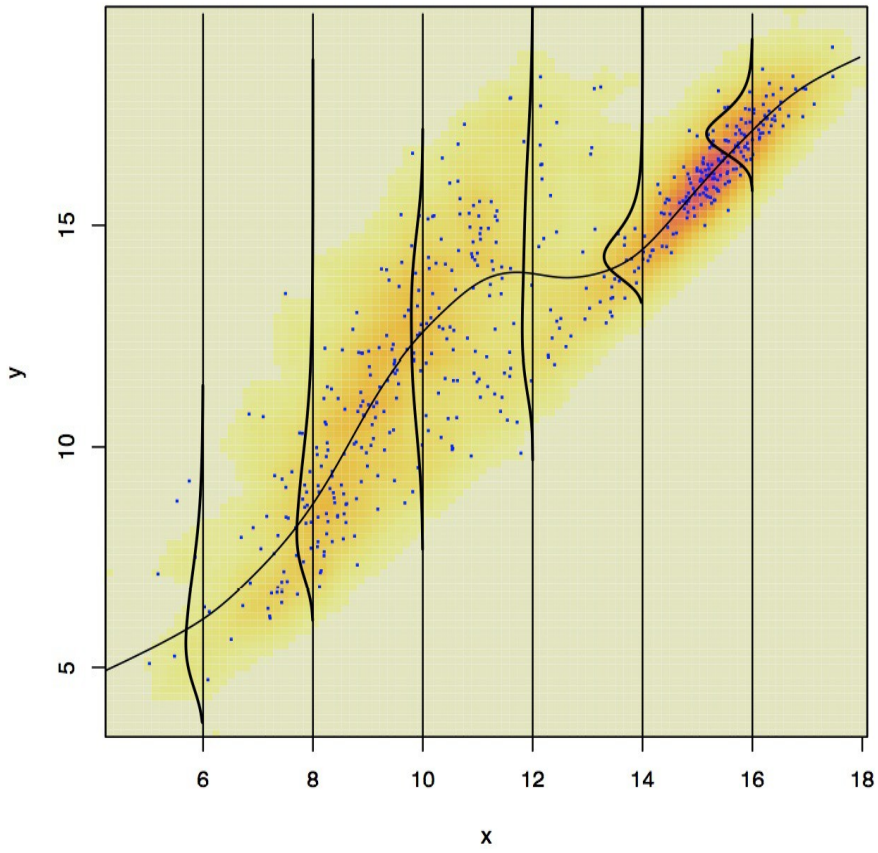
GAMLSS – novel regression framework when life is not '**normal**'

Simple Regression



GAMLSS



GEST
(work in progress)

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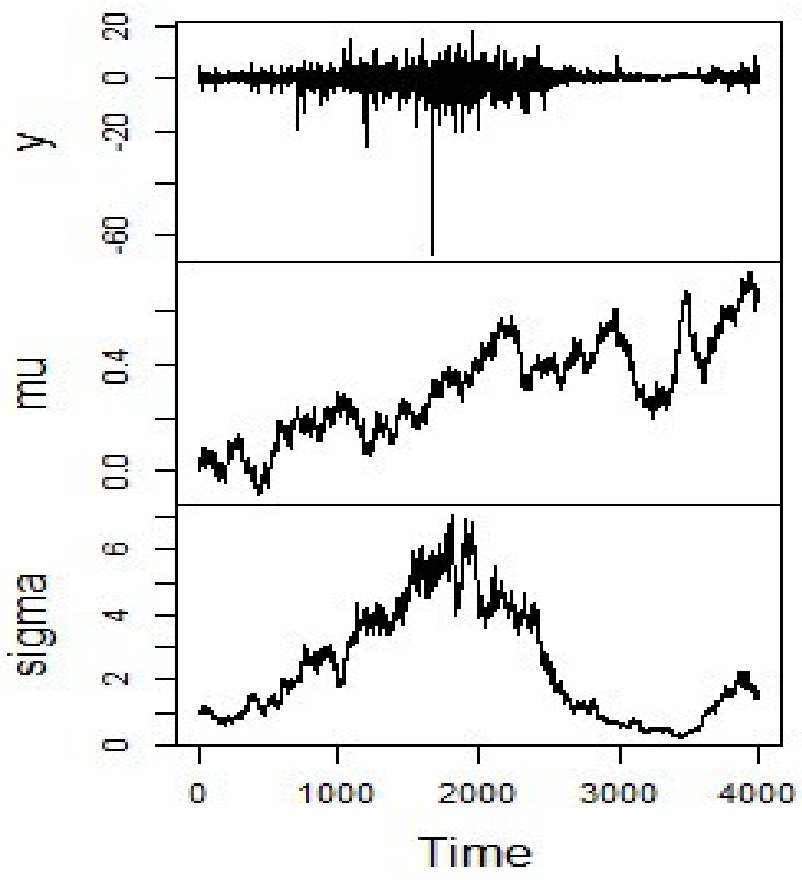
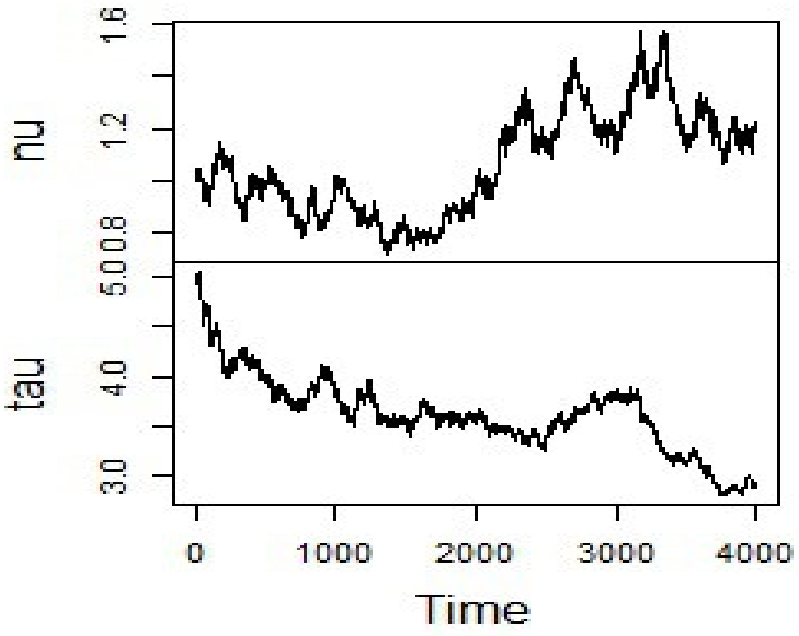
GEST – when 'black swans' are part of reality





STRATEGIC RISKS

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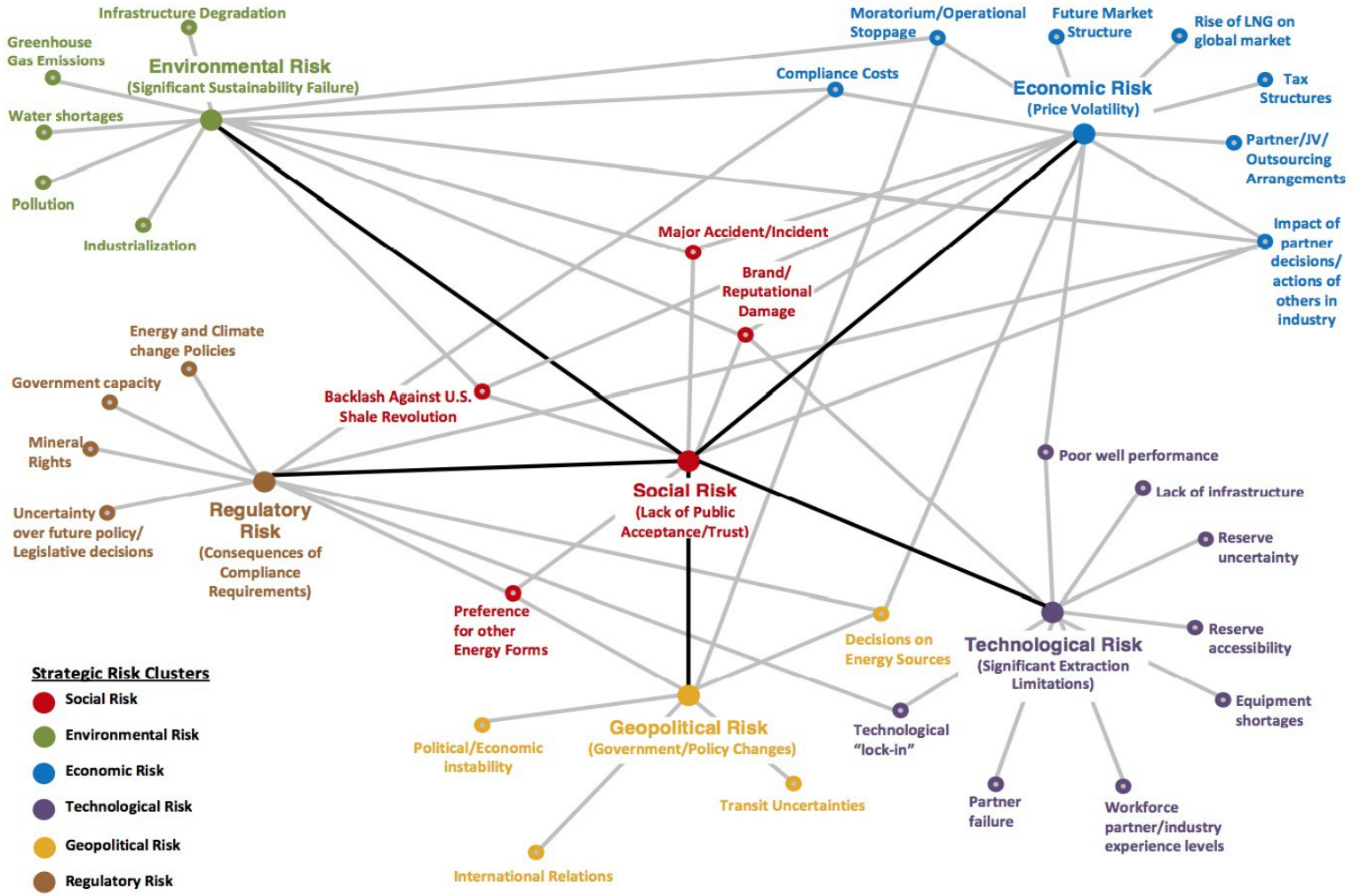
European shale gas



ACEWEM
(work in progress)

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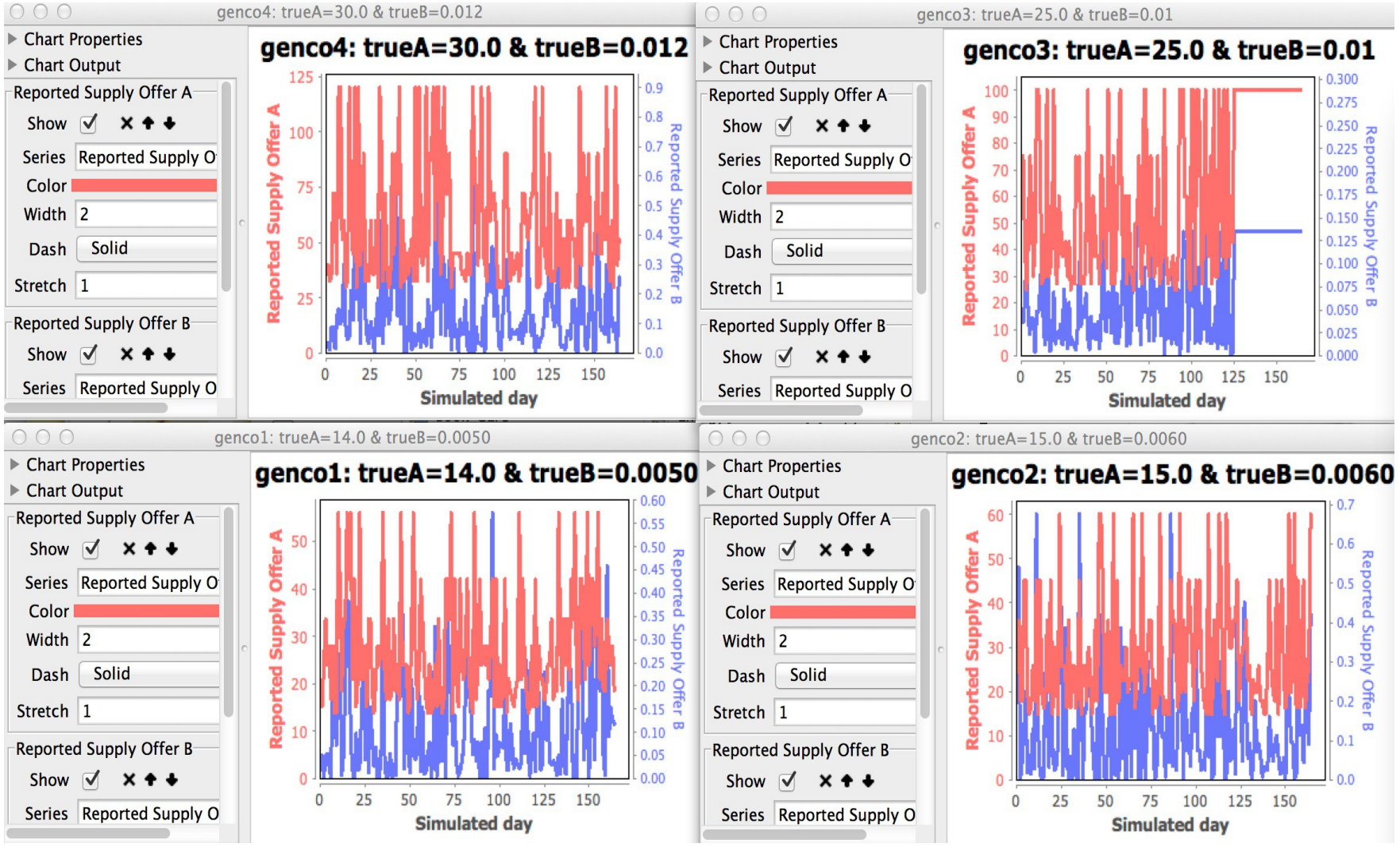
ACEWEM – Agent-based model for wholesale electricity markets



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Thank You

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