

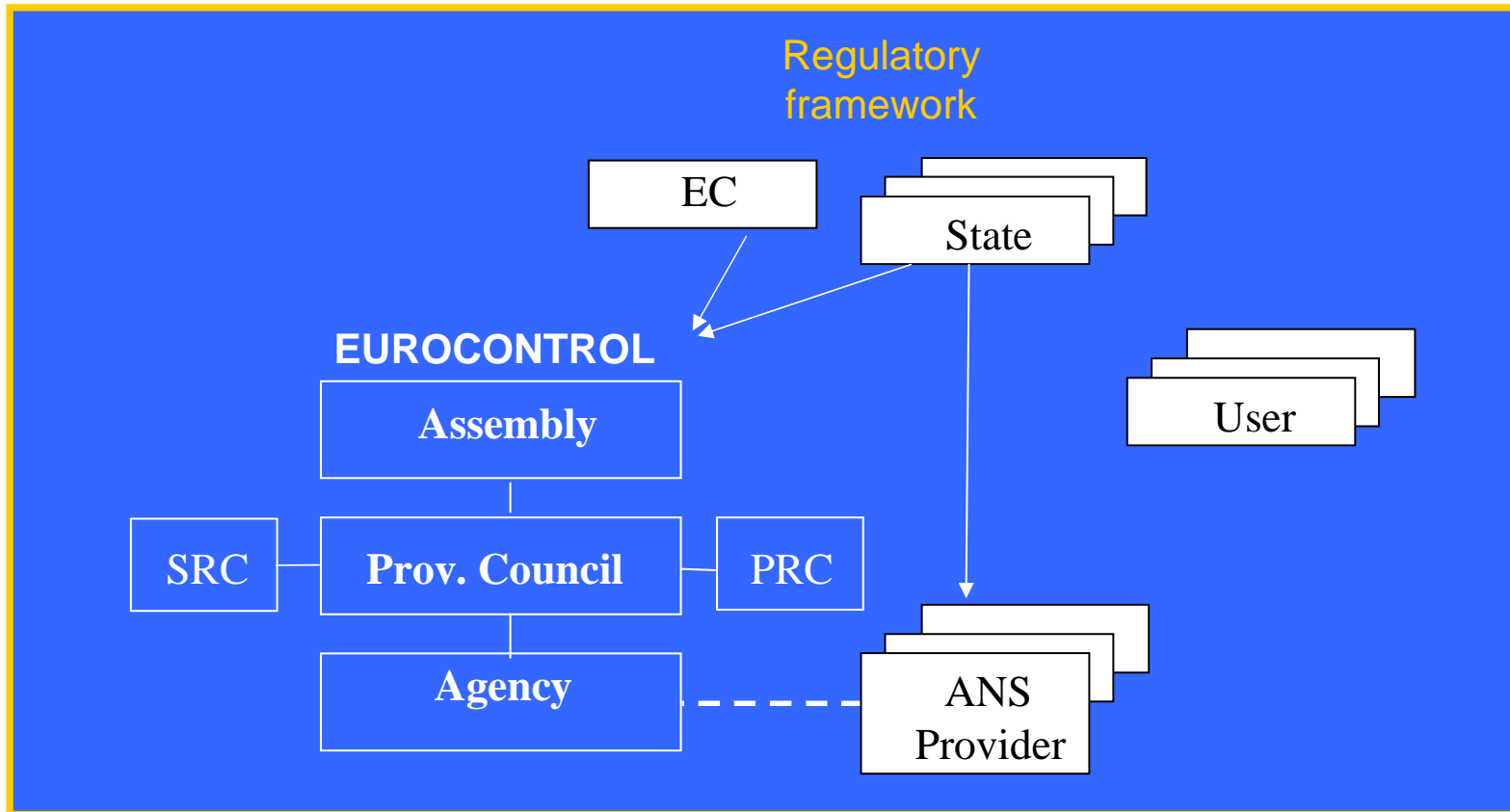
# **Five Years Experience in ATM Cost Benchmarking**

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**7th USA/Europe ATM 2007 R&D seminar  
2 July 2007**

Presentation by Sebastien Portet  
EUROCONTROL Performance Review Unit

# Institutional background of the EUROCONTROL Organisation



EUROCONTROL Organisation (37 Member States + European Community)  
Safe and efficient Air Navigation Services

# Performance Review Commission (PRC)

*“to ensure effective management of the European air traffic management system through a strong, transparent and independent performance review system”*

- Since 1998
- Independent expert commission
- **Monitor & analyse ATM performance**
  - Produce Annual Performance Review Reports
    - ATM KPAs (Safety, Capacity/Delays, Flight efficiency, Cost-effectiveness);
    - Special items;
  - Electronic versions of the Reports available on PRC website:  
[www.eurocontrol.int/prc/public/standard\\_page/doc\\_prr.html](http://www.eurocontrol.int/prc/public/standard_page/doc_prr.html)
- **Make recommendations on target setting**
- **Not economic regulator**



# Economic Information Disclosure

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- **En-route Air Navigation Services Providers**
  - statutory monopolies
- **Decision No. 88 of the EUROCONTROL Commission in Nov. 2001**
  - Mandatory provision of economic and related information by Air Navigation Service Providers (ANSPs)
  - Allow PRC/PRU to discharge its performance review role in the field of cost-effectiveness and produce detailed benchmarking analysis
- **Reduce asymmetry of information**
- **Allow sound quantitative analysis**

# PRC Benchmarking analysis

- **Least intrusive regulatory instrument: “sunshine regulation”**

- Production of Benchmarking Reports
  - Independent and impartial analysis
- Naming and shaming



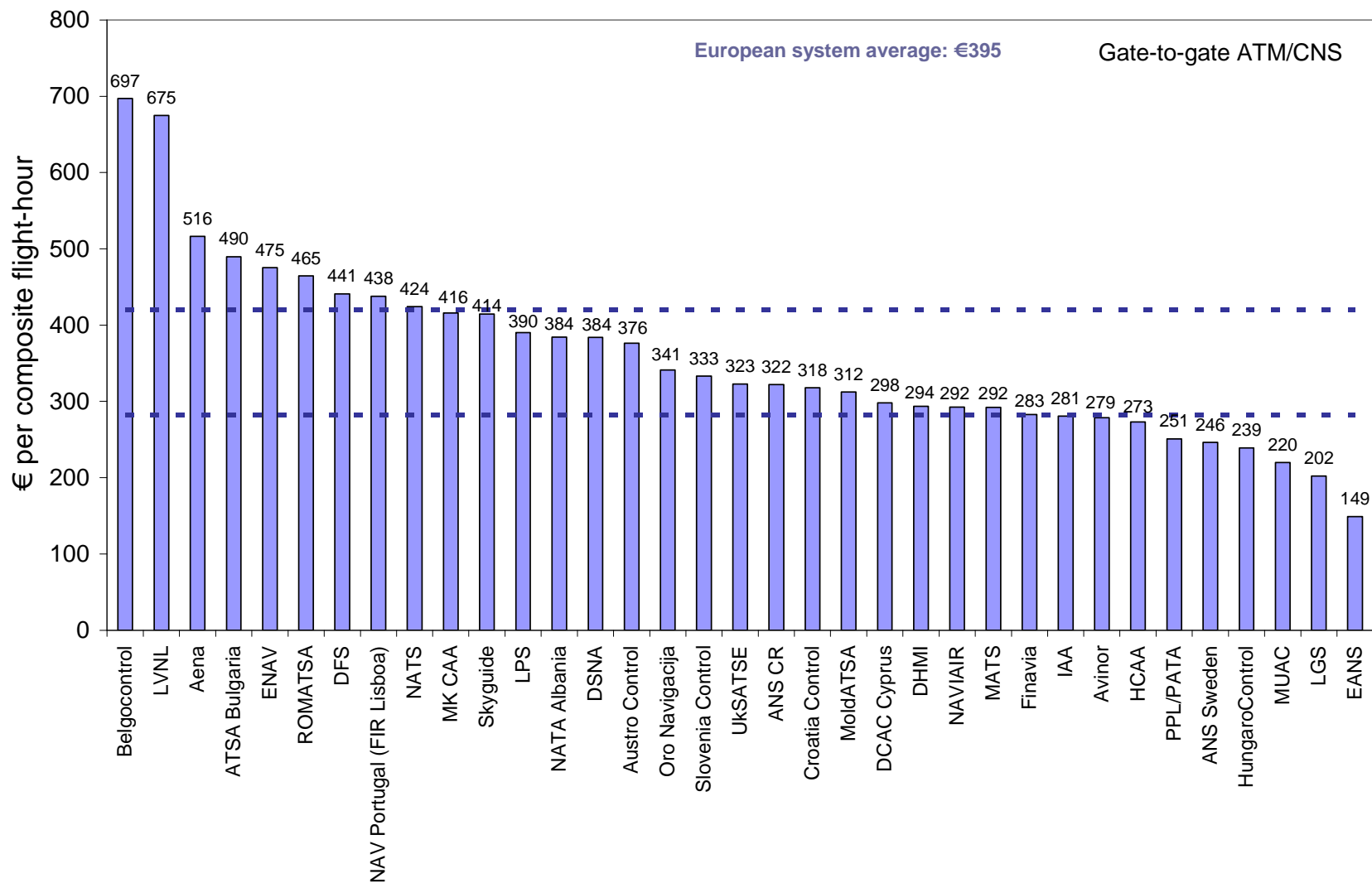
- **Who benefits from the PRC Benchmarking analysis?**

- Airspace users
- Policy makers
- ANSPs
- Others

- **Cooperative process**

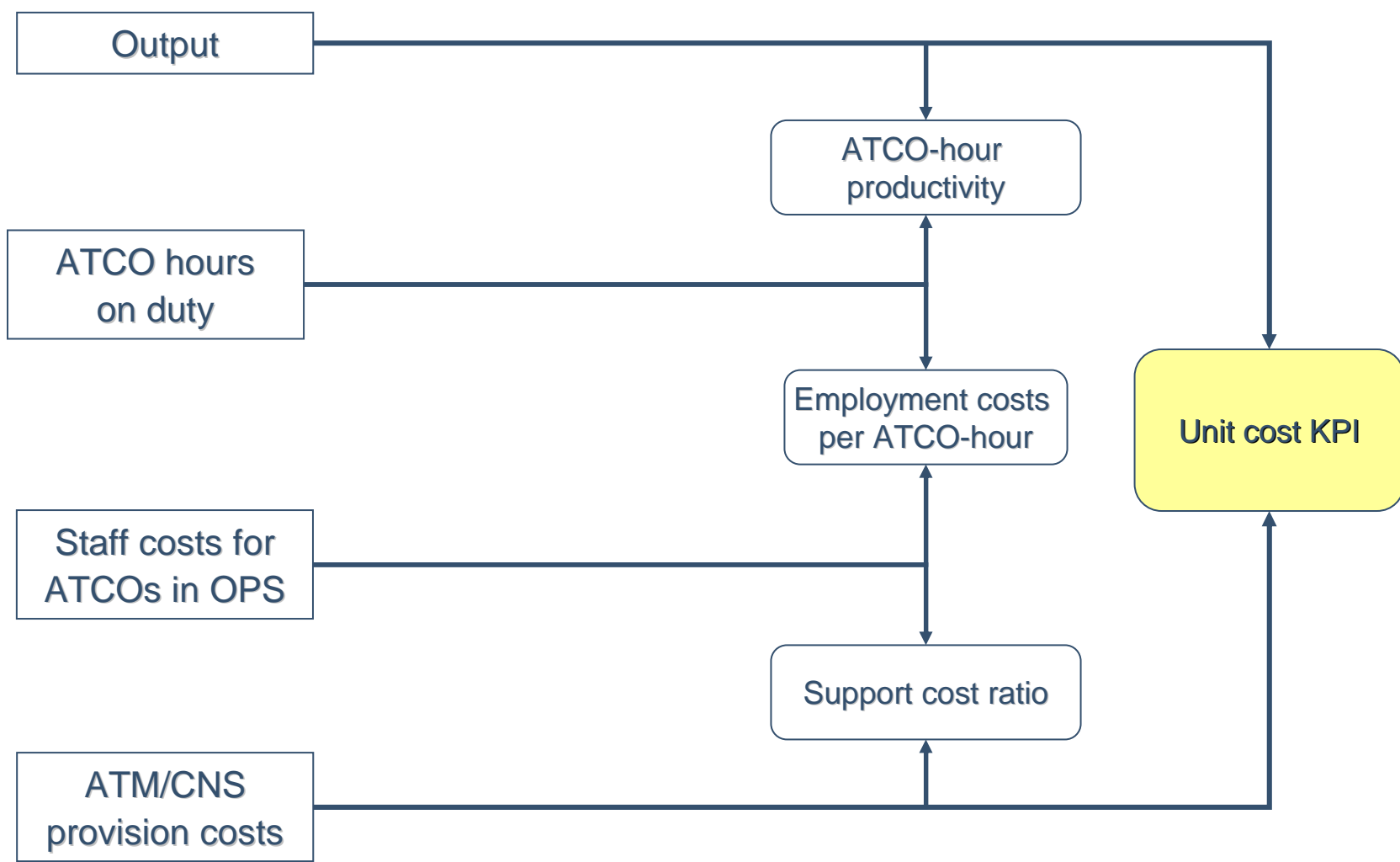
- Creation of a working group with ANSPs, regulators and airspace users
- Identify areas for improvement & best practices
- Culture of performance measurement & management

# Range in ANSPs unit costs in 2005



**Factual indicator: cannot be interpreted as a measure of cost-inefficiency**

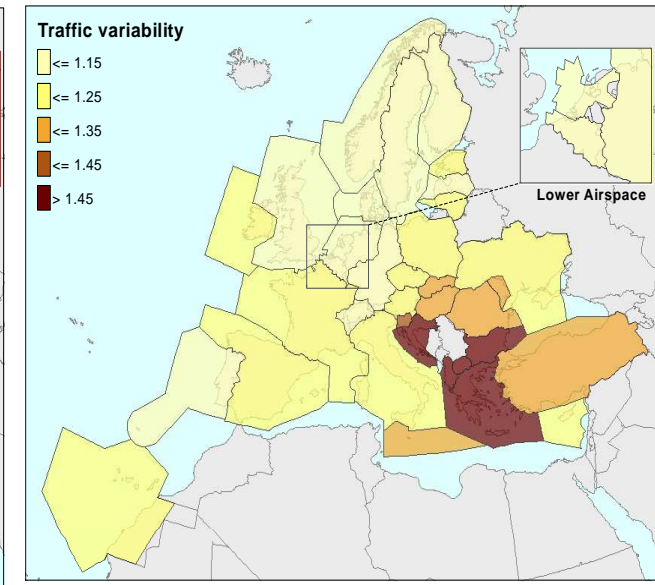
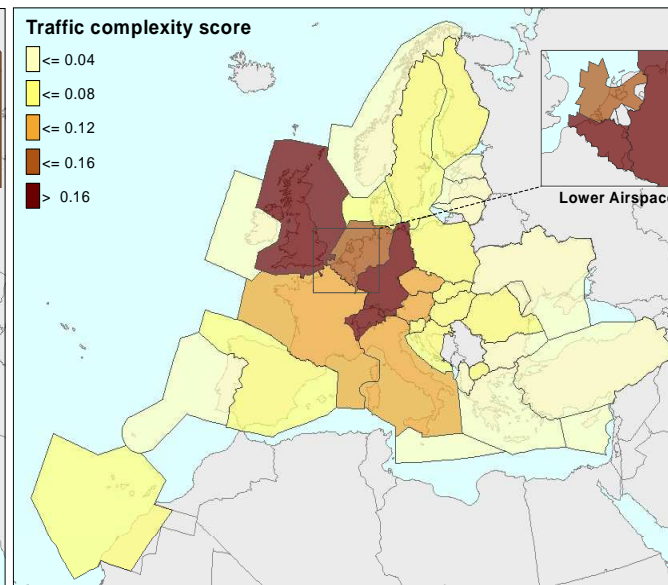
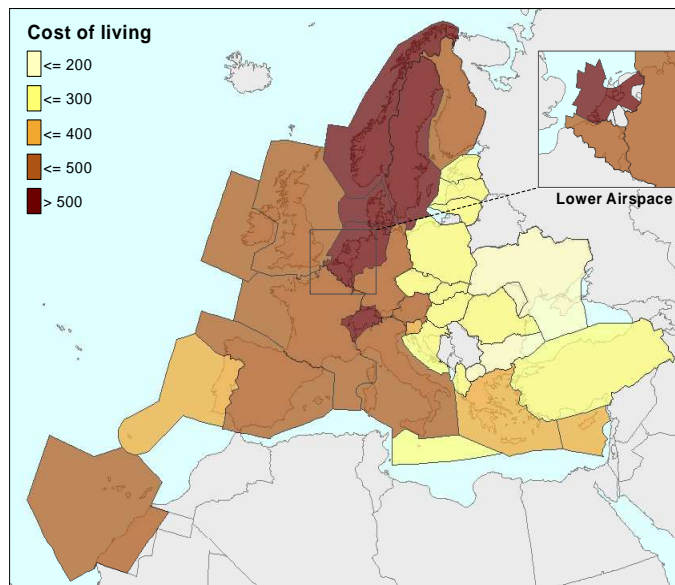
# PRC framework to analyse ANSPs cost-effectiveness



# Factors affecting performance

- High level of heterogeneity between ANSPs (small vs large, institutional and reg. arrangements, etc).
- International comparisons should be seen in the light of these differences
- Three **exogenous** factors which are outside ANSP control are measured by PRC:
  - Cost of living
  - Traffic complexity
  - Traffic variability

How to measure the impact of these factors on ANSPs performance?





# Econometric cost benchmarking of ANSPs

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- **Moving from a factual analysis to a normative analysis of cost-effectiveness**
- **PRU in collaboration with economic consultants (NERA) carried out a comprehensive econometric analysis of ANSPs costs**
- **ACE data set comprises both cross-sectional and time series data (panel data)**
  - 32 ANSPs
  - 4 years of observations
- **Several technical and methodological challenges to be resolved**
  - High level of heterogeneity (observed and unobserved) in ACE data set

# Econometric cost benchmarking: cost function specification

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- **Specification of a classical cost function**
  - C = function of (output(s), input prices, operational characteristics, complexity, cost of living, etc...)
  - Impact of measured exogenous factors can be directly estimated
- **Panel data estimation methodology**
  - Allow to control for unobserved differences between ANSPs
- **Need robust and well suited econometric techniques to assess inefficiencies**
- **To our knowledge: first application of econometric theory to ANS performance measurement**

# Econometric cost benchmarking: Estimation results

Dependent variable: Total costs	Random Effects model				
	(I)	(II)	(III)	(IV)	(V)
<b>Regressors:</b>					
Output	0.224 [0.102]**	0.198 [0.103]*	0.143 [0.138]	0.179 [0.136]	0.139 [0.140]
ATCO hourly employment cost	0.249 [0.065]***	0.255 [0.064]***	0.239 [0.070]***	0.234 [0.072]***	0.237 [0.070]***
Non-ATCO unit employment cost	0.497 [0.049]***	0.486 [0.049]***	0.475 [0.052]***	0.489 [0.052]***	0.475 [0.052]***
Capital input price	0.195 [0.039]***	0.187 [0.039]***	0.192 [0.040]***	0.2 [0.040]***	0.192 [0.040]***
Non-staff operating input price <sup>§</sup>	0.059 [n/a] ‡	0.072 [n/a] ‡	0.094 [n/a] ‡	0.077 [n/a] ‡	0.096 [n/a] ‡
Network size	0.409 [0.094]***	0.399 [0.096]***	0.427 [0.107]***	0.434 [0.106]***	0.428 [0.107]***
Seasonal variability		-0.55 [0.466]	-0.573 [0.467]		-0.571 [0.466]
Complexity score			0.073 [0.123]	0.062 [0.125]	
Adjusted density					0.079 [0.127]
Structural complexity					0.056 [0.153]
Constant	1.883 [1.303]	2.525 [1.433]*	3.246 [1.897]*	2.452 [1.745]	3.296 [1.916]*

\*significant at the 10 per cent confidence level; \*\* significant at 5 per cent confidence level; \*\*\* significant at 1 per cent confidence level

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## Econometric cost benchmarking: Conclusions and steps forward

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- **For time being the focus is on the methodology rather than on the results**
  - “State of the art” econometric modelling to examine ANSPs cost inefficiencies
  - Difficult to draw clear conclusions from the results
  - Sophisticated econometric techniques require larger data samples – typically several hundreds of observations !
  
- **Work in progress as the data set expands**
  - Opportunity to test alternative assumptions with enhanced data disclosure