

Arthur Thomas



Personal Information

Website: www.arthurthomas.fr
Email: arthur.thomas.assistant@ensae.fr
Num: +33 6 45 50 97 27

ENSAE Paris
Bureau 3098
5 avenue Henry le Chatelier
91764 PALAISEAU Cedex

Academic positions

Teaching and Research Fellow for Computer Science in ENSAE Paris

Sept 2020 - École Nationale de la Statistique et de l'Administration Économique (ENSAE), France

CREST-ENSAE Affiliated Member

May 2021

Associated researcher in the Climate Economics Chair

May 2021

Associated researcher in the Chair of the Economics of Natural Gas

Oct 2017

Research interests

Theoretical Econometrics; Bayesian Econometrics; Noncausal Econometrics; Structural Econometrics; Energy economics; Forecasting; Machine Learning

Education

PhD in Economics

16 Oct 2017 - 14 Dec 2020

LEMNA, Université de Nantes, EDGE, France

- Title: *The Econometrics of Energy Demand: Identification and Forecast*
 - Advisors: Benoît Sévi (Professeur, Université de Nantes)
 - Co-Advisors: Olivier Massol (Associate professor, City, University of London & IFP School)
- Committee:
- Karim Abadir (Professor of Financial Econometrics, Imperial College London, External Reviewer)
 - Derek Bunn (Professor of Decision Sciences, London Business School)
 - Dimitris Korobilis (Professor of Econometrics, University of Glasgow, External Reviewer)
 - Valérie Mignon (Professeure des Universités, Université Paris Nanterre)

Master of Science in Statistics

2014-2017

Diplôme d'ingénieur - France's Grandes écoles", ENSAI (RENNES) - National School for Statistics and Data Analysis

Preparatory classes (MP)

2012-2014

Lycée Henry Poincaré (Nancy)

Research activity

Publications:

How are day-ahead prices informative for predicting the next day's consumption of natural gas? Evidence from France, *The Energy Journal* (HCERES: A, CNRS: 1)

2021

avec Olivier Massol et Benoît Sévi

Abstract: The purpose of this paper is to investigate, for the first time, whether the next day's consumption of natural gas can be accurately forecast using a simple model that solely incorporates the information contained in day-ahead market data. Hence, unlike standard models that use a number of meteorological variables, we only consider two predictors: the price of natural gas and the spark ratio measuring the relative price of electricity to gas. We develop a suitable modeling approach that captures the essential features of daily gas consumption and, in particular, the nonlinearities resulting from power dispatching and apply it to the case of France. Our results document the existence of long-run relation between demand and spot prices and provide estimates of the marginal impacts that these price variables have on observed demand levels. We also provide evidence of the pivotal role of the spark ratio in the short run which is found to have an asymmetric and highly nonlinear impact on demand variations. Lastly, we show that our simple model is sufficient to generate predictions that are considerably more accurate than the forecasts published by infrastructure operators.

Working paper:

Identifying oil supply news shocks and their effects on the global oil market, *submitted*

2021

avec Zakaria Moussa

This paper uses a new empirical strategy to identify oil supply news shocks within a Non-Causal VAR model of standard global oil market variables. These shocks explain most of the movements in oil production over a long but finite time horizon. Our findings highlight the prominent role of expectations in propagating shocks. Negative oil supply news shocks cause abrupt and permanent reactions in global oil production, global economic activity and in oil inventory. However, an oil supply shock has only a limited effect on oil price. Finally, a news shock regarding oil supply shortfalls has macroeconomic consequences, causing a substantial decline in US industrial production.

Real-time demand in U.S. natural gas price forecasting: the role of temperature data, *submitted*

2021

avec Benoît Sévi and Zakaria Moussa

This paper provides evidence of the pivotal role temperature data can play in forecasting natural gas prices at the Henry Hub in real time. Considering a newly constructed temperature index as an additional exogenous variable in a Bayesian vector autoregressive (BVAR) framework significantly increases forecast accuracy at horizons of up to 12 months. Our novel approach to energy price forecasting simultaneously considers both supply and demand and incorporates temperature data as a proxy of real-time demand for natural gas.

The role of expectations in predicting the real prices of oil: a non-causal analysis 2021

Abstract: This paper revisits the predictive power of convenience yield for oil by incorporating expectations into an empirical specification through the estimation of Bayesian non-causal VAR. We empirically show that expectations play a significant role in the determination of oil prices. Second, we provide empirical evidence that real-time forecasts of real oil prices can be remarkably more accurate than the no-change forecast and significantly more accurate than real-time forecasts generated by existing structural models relying on Bayesian VAR. Beyond the traditional analysis at the monthly frequency, we further investigate the forecasting accuracy of our empirical specification at the daily and weekly frequency, resulting in interesting findings for potential investment purpose.

Production intermittence in spot electricity markets: a behavioral simulations approach 2019

avec Albert Banal-Estanol, Olivier Massol et Augusto Ruperez Micola

Abstract: This paper analyzes the influence of production intermittence on spot electricity markets. More specifically, we examine how the presence of a competitive fringe operating low-cost intermittent generation assets modifies the bidding behavior of the strategic players who own the conventional (reliable) power plants. We first use game theory to derive the market outcomes obtained with perfectly rational players. We then compare them with the ones obtained when the players behave as adaptive traders who follow the Camerer and Ho (1999) behavioral model. The simulation results show that, compared to the theoretical benchmark, intermittent technologies yield lower prices when incumbents have individual market power, but are higher when they do not have it. We also run the simulations for a series of alternative specifications. The results indicate that this finding happens under different intermittence and ownership configurations. We also observe that replacing high-cost assets with low-cost ones results in prices that are higher than when they are left to co-exist

Communications

2021

- 7th RCEA Times series workshop, University of Milano-Bicocca.

2020

- Thé des économètres, Paris, France.

- 37th International Conference of the French Finance Association (AFFI), Nantes, France.
- 19^{ème} Journée d'Économétrie, Développements Récents de l'Econométrie Appliquée à la Finance, EconomiX, Nanterre, France (présentation et discussions).
- 2nd International Conference Environmental Economics: A Focus on Natural Resources, University of Orleans.

2019

- Discutant junior invité au Séminaire doctorant, Université Paris Nanterre, France.
- 13th International Conference on Computational and Financial Econometrics, London, UK.
- INFORMS Annual meeting 2019, Seattle, USA.
- 13th Annual Trans-Atlantic Infraday Conference, Washington, USA.
- 18^{ème} Journée d'Économétrie, Développements Récents de l'Econométrie Appliquée à la Finance, EconomiX, Nanterre, France (présentation et discussions).
- Séminaire CREST-ENSAI 2019, Rennes, France.
- Thé des économètres, Orléans, France.
- Workshop in Financial Econometrics, Nantes, France.
- The 3rd Commodity Markets Winter Workshop-Leibniz University, Hannover, Germany.
- Workshop EDGE 2019, Rennes, France.
- The 2nd International Conference The Economics of Natural Gas, University Paris-Dauphine, Paris, France.

2018

- 12th International Conference on Computational and Financial Econometrics, Pisa, Italy.
- 41st edition of the IAEE international conference, Groningen, Netherland.
- FAEE summer workshop, Mines ParisTech, Paris, France (présentation et discussions).
- 29th European Conference On Operational Research. Valencia, Spain.
- INFORMS 2018 Annual Meeting Phoenix, USA.
- 11th Annual Trans-Atlantic Infraday Conference, Washington, USA.
- Commodities and Energy Market Organization in the Energy Transition Context, IFP Energies nouvelles, Rueil-Malmaison, France.

Refereeing activities

Annals of economics and statistics , *Energy Journal*, *Energy Economics*

Other research activities

- Conference organization:
 - 43rd IAEE International Conference, Paris, France.
 - 37th International Conference of the French Finance Association (AFFI), Nantes, France
- **Junior researcher associated in "Les Jeunes Economètres"**
 Les Jeunes Economètres is a working group created in September 2016 on time series econometrics. Its aim is to bring together young econometricians (doctoral students at the end of their thesis, post-doctoral fellows and young Associate professors) from the Paris region in order to encourage scientific collaboration and the setting up of funded projects. The group meets monthly at a seminar entitled "Thé des économètres" for presentations and discussions on theoretical and applied econometric issues. It currently includes 27 members from the Universities of Panthéon-Sorbonne, Paris Dauphine, Paris Nanterre, Paris 8, Paris 13, Orléans, Cergy, Nantes, ENSAE (CREST), ESSEC Business School and Paris School of Economics

References

Benoît Sévi

Professeur des Universités
 Director of LEMNA (EA 4272),
 Université de Nantes
 benoit.sevi@univ-nantes.fr
 Tel: +33 (0) 2 40 14 17 96
 LEMNA EA 4272, Université de Nantes
 Chemin de la Censive du Tertre
 Bâtiment Tertre, BP 52231
 44322 Nantes cedex 3
 Website:
<https://sites.google.com/site/benoitsevi/>

Olivier Massol

Associate Professor in Economics
 IFP School
 Center for Economics and Management
 228-232 avenue Napoléon Bonaparte,
 92852 Rueil-Malmaison Cedex, France.
 olivier.massol@ifp.fr

Karim Abadir

Professor of Financial Econometrics
 Imperial College
 3.03 53 Prince's Gate
 South Kensington Campus
 London, UK
 E-mail : k.m.abadir@imperial.ac.uk
 Website:
<https://www.imperial.ac.uk/people/k.m.abadir>

Dimitris Korobilis

Professor of Econometrics
 Adam Smith Business School
 University of Glasgow
 Dimitris.Korobilis@glasgow.ac.uk
 Tel: +44 (0) 141 330 2950
 University Avenue
 G12 8QQ, Glasgow, UK
<https://sites.google.com/site/dimitriskorobilis/>

Teaching activities

Teaching assistant Deep Learning: Models and Optimization (6h) <i>M2-ENSAE</i>	Jan 2021
Lecturer: Econometric Methods for Large Dataset (18h) <i>M2-EEET Université Paris-Saclay</i>	Jan 2021
Lecturer: Introduction to Python (6h) <i>M2- ENSAE</i>	2020
Lecturer: Introduction to R (6h) <i>M2 -ENSAE</i>	2020
Teaching assistant: Econometrics (30h) <i>Pantheon-Sorbonne Master In Economics</i> Université Paris 1 Panthéon Sorbonne	2019
Teaching assistant: Time series modelling (40h) <i>Université Paris-Descartes</i>	2017

Miscellaneous

<i>Languages</i>	Français (Native) English - TOEIC: 890/990 German- level A2
<i>Software</i>	Java, C++ and C#
<i>Statistical software</i>	Stata, SAS, R, Python, Matlab and Julia, GPU