Arnaud Dufays, PhD

Associate Professor – Speciality: Data Science

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Arnaud Dufays is currently associate professor in Data Science. He holds a PhD in management science from Catholic University of Louvain.
His research interests include Bayesian econometrics and advanced statistical modelling of time series. In particular, he has developed multiple methods for detecting instabilities in time series. This allows to make better predictions and leads to better understanding of the dynamic of series. More specifically, focusing on financial and macroeconomic time series, he develops models and estimation methods to capture instabilities in contexts of path dependence, of large sample, etc.
Arnaud Dufays has published papers in prestigious academic journals such as Journal of Econometrics, Journal of Business and Economic Statistics, Journal of Applied Econometrics, Journal of Financial Econometrics, studies in Nonlinear Dynamics and Econometrics, Econometric Reviews, Journal of Empirical Finance and Econometrics.
Arnaud Dufays has previous experience in several international universities. He has spent three years as an assistant professor at Laval University, two years as a F.R.S.-FNRS research at Namur University and one year at ESSEC Business school as an invited professor. During these experiences, he had the opportunity to teach at the undergraduate, graduate and PhD level.

EDUCATION

2014-2015 **Post-doc.**
Université Catholique de Louvain (Belgium)

2013-2014 **Post-doc.**
Centre de Recherche en Economie et Statistique (CREST) (France)

2009-2013 **PhD candidate in Economics**
Université Catholique de Louvain (Belgium)

2008-2009 **Research master [120-ECTS] in Economics**
Université Catholique de Louvain (Belgium)

2003-2008 **Civil Engineering in applied mathematics**
Université Catholique de Louvain (Belgium)

PROFESSIONAL EXPERIENCE

2022- **Associate Professor** - EDHEC Business School (France)

2020-2021 **Visiting Assistant Professor** - Essec Business School (France)

2018-2021 **Visiting Professor** - Université Laval (Canada)

2018-2020 **F.R.S-FNRS Researcher** - Université Namur (Belgium)

2015-2018 **Assistant Professor** - Université Laval (Canada)

Jul-Nov 2013 **Internship** - National Bank of Belgium (Belgium)

PUBLICATIONS

Published Papers

1. Dufays, A. and Li Zhuo and Rombouts, J. and Song Y., 'Sparse Change-point VAR models', Journal of Applied Econometrics, 2020, 36(6), 703-727. [Paper], [Video].

2. Dufays, A. and Houndetoungan, A. and Co¨en, A., 'Selective linear segmentation for detecting relevant parameter changes', Published in Journal of Financial Econometrics, 2020. [Paper], [Video].

3. Donfack M. and Dufays A., 'Modeling time-varying parameters using artificial neural networks: A GARCH illustration',Studies in Nonlinear Dynamics & Econometrics, 2020, Vol 25 (5). [Paper].

4. Dufays, A. and Rombouts, J., 'Relevant parameter changes in structural break models', Journal of Econo- metrics, 2020, 217 (1), 46-78. [Paper], [Code], [Video].

5. Augustinyak, M. and Dufays A., ' Modeling macroeconomic series with regime-switching models characterized by a high-dimensional state space', Economic Letters, 2018, 170, 122-126. [Paper], [Code], [Video].

6. Augustinyak, M. and Bauwens, L. and Dufays A., 'A new approach to volatility modelling: the factorial hidden Markov volatility model', Journal of Business and Economic Statistics, 2018, 1-14. [Paper], [Code], [Video].

7. Dufays A. and Rombouts, J. 'Sparse Change-point HAR Models for Realized Variance', Econometric Reviews, 2018, 1-24. [Paper], [Video].

8. Bauwens, L., Carpantier J.-F., and Dufays A., 'Autoregressive Moving Average Infinite Hidden Markov-Switching Models', Journal of Business and Economic Statistics, 2017, 35(2), 162-182. [Paper].

9. Dufays A., Infinite-State Markov-switching for Dynamic Volatility, Journal of Financial Econometrics, 2016, 14 (2): 418-460. [Paper], [Code], [Video].

10. Dufays A., 'Evolutionary Sequential Monte Carlo samplers for Change-point models', Econometrics, 2016, 4(1), 12. [Paper], [Code], [Video].

11. Bauwens L., De Backer B. and Dufays A., 'A Bayesian method of Change-point estimation with recurrent regime: Application to GARCH Models', Journal of Empirical Finance, 2014, 29, 207-229. [Paper].

12. Bauwens L., Dufays A. and Rombouts J., 'Marginal Likelihood Computation for Markov Switching and Change- point GARCH Models', Journal of Econometrics, 2013, 178 (3), 508-522. [Paper], [Code].

Book chapter

1. Dufays, A., 'Bayesian inference', entry in Research Methods in Social Sciences: An A-Z of Key Concepts', edited by Morin J.-F., Olsson C. and Atikcan E., Oxford University Press, 2021.

Ongoing research

1. Ardia, D. and Dufays, A. and Ordas, C., 'Frequentist and Bayesian change-point models: A missing link', 2019. [Draft], [Video].

2. Boucher V. and Dedewanou F. and Dufays A., 'Peer-Induced Beliefs Regarding College Participation', 2018. [Draft].

REFEERING ACTIVITIES

Journal of Computational and Graphical Statistics, Journal of Econometrics, Journal of Business and Economic Statistics, Journal of Applied Econometrics, Journal of Financial Econometrics, North American Journal of Economics and Finance, Econometrics and Statistics, Journal of Empirical Finance, Studies in Nonlinear Dynamics and Econometrics, International Journal of Forecasting, Empirical Economics, Journal of the Royal Statistical Society: Series B, Journal of Banking and Finance, Computational Statistics and Data Analysis (CSDA), Statistical Inference for Stochastic Processes, Société Française de Statistique.

SEMINARS

Jan 2021	Université du Quebec à Montréal (UQAM), Montréal.
Nov 2020	EDHEC Business School, Lille.
Dec 2019	Université de Saint-Louis, Bruxelles.
Nov 2019	HEC Montréal, Montréal.
Oct 2019	HEC Liège, Liège.
Oct 2019	Center for Operations Research and Econometrics (UCL), Louvain-la-Neuve.
Sep 2019	DeFipp seminar, Namur.
Mar 2019	Aix-Marseille School of Economics, Marseille.
Feb 2019	Maastricht University, Maastricht.

Nov 2018	ShanghaiTech University, Shanghai.
Nov 2018	Université de Neuchâtel, Neuchâtel.
Mar 2018	Université de Montréal, Montréal.
May 2017	Namur University, Namur.
Mar 2016	McMaster University, Hamilton.
Nov 2015	Université de Montréal, Montréal.
Sep 2015	Université Laval, Québec.
Jan 2015	Université Laval, Québec.
Jan 2015	Carleton University, Ottawa.
Oct 2014	Université Paris 1 Panthéon - Sorbonne, Paris.
Oct 2014	Ecole Nationale de la Statistique et de l'Administration économique - Paris.
Feb 2014	National Bank of Belgium, Brussels.
Feb 2014	Center for Operations Research and Econometrics (UCL), Louvain-la-Neuve.
Jan 2014	Centre de Recherche en Economie et Statistique (CREST), Paris.

CONFERENCES

Jun 2021	SoFiE Conference, virtually in San Diego.
Aug 2020	Econometric Society Virtual World Congress, virtual conference.
Dec 2019	12th international conference of the ERCIM Computing and Statistics, London.
Jun 2019	13th RCEA Bayesian Econometrics Workshop, Larnaca.
Dec 2018	11th international conference of the ERCIM Computing and Statistics, Pisa.
Jun 2018	Conference of International Association for Applied Econometrics, Montréal
Apr 2018	Workshop on forecasting from complexity, Minneapolis.
Dec 2017	10th international conference of the ERCIM Computing and Statistics, London.
Jun 2017	SoFiE Conference, New-York.
Dec 2016	9th international conference of the ERCIM Computing and Statistics, Sevilla.
Jun 2016	Melbourne Bayesian Economic Workshop, Melbourne.
Dec 2015	8th international conference of the ERCIM Computing and Statistics, London.
Nov 2014	European Seminar on Bayesian Econometrics (ESOBE), Paris.
Jun 2014	Conference of International Association for Applied Econometrics, London.
Dec 2013	6th international conference of the ERCIM Computing and Statistics, London.
Dec 2012	5th international conference of the ERCIM Computing and Statistics, Oviedo.
Aug 2012	Rimini Conference in Economics and Finance 2012, Toronto.
Dec 2011	4th international conference of the ERCIM Computing and Statistics, London.
Nov 2011	European Seminar on Bayesian Econometrics (ESOBE), Brussels.
Aug 2011	10th OxMetrics User Conference, Maastricht.
May 2011	Econometric and statistical modelling of multivariate time series, Louvain.
Dec 2010	3rd international conference of the ERCIM Computing and Statistics, London

TEACHING ACTIVITIES

2022	M.Sc. - Time series - EDHEC Business School.
2021	M.Sc. - Data Mining - EDHEC Business School.
2021	B.A. - Multivariate Data Analysis (Coordinator) - EDHEC Business School.
2021	M.Sc. - Introduction to Econometrics - Essec Business School.
2021	Ph.D. - Time series analysis - Essec Business School.
2020	M.Sc. - Introduction to Econometrics - Essec Business School.
2020	Ph.D. - Introductory Econometrics - Essec Business School.

2018	M.Sc. and Ph.D. - ECN-7330 _Econom_etrie Bayesienne - Université Laval.
2015-2018	M.Sc. and Ph.D. - ECN-7320 _Econom_etrie _nanci_ere - Université Laval.
2015-2018	B.A. - ECN-1040 Mesure des grandeurs _economiques - Université Laval.
2014	Ph.D. - 2-days course - IRTG 1792 course on CP/MS models, Berlin.
2013-2014	B.A. - Lecturer - Applied Econometrics : Time Series - UCL.
2013	M.Sc. and Ph.D. - TA of the spring course : Bayesian Econometrics, Coimbra.
2009-2012	M.Sc. and Ph.D. - TA of the course : Advanced Econometrics - UCL.

PhD SUPERVISION, MEMBER OF THESIS COMMITTEES AND MASTER SUPERVISION

2016-2021	Morvan Nongni Donfack, Université Laval, Thesis Advisor: Arnaud Dufays.
May 2018	Jean-Armand Gnagne, Université Laval, Thesis Advisor: Kevin Moran.
Oct 2017	Abdellah Manadir, Université Laval, Thesis Advisor: Kevin Moran.
Jun 2017	Nettey Boevi Gilles Koumou, Université Laval, Thesis Advisor: Benoit Carmichael.
Sep 2016	Ali Yedan, Université Laval, Thesis Advisor: Bernard Fortin.
Jun 2017	Mylèene Lonko, Maitrise avec essai, Master thesis advisor: Arnaud Dufays.
Jun 2017	Yosra Salhi, Maitrise avec essai, Master thesis advisor: Arnaud Dufays

VISITING

May-Jun 2017	Université Namur.
May-Aug 2012	HEC Montréal under the supervision of Jeroen Rombouts.

GRANTS

2019-2020	SAS/IIF research grant (5000 USD with Pr. Ardia).
2017-2018	SSHRC-CRSH: Développement Savoir (27.747 CAD/year).
2015-2018	Fonds Quéebecois de la Recherche - société et culture (15.000 CAD/year).