# Raf Wouters

Curriculum Vitae

2021

**Professional address**

Research and Economics Department
National Bank of Belgium
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**Education**

KULeuven, MBA, 1988.
KULeuven, Master of Arts in Economics, 1983.
KULeuven, Licentiaat Economie, 1982.

**Professional Experience:**

Adviser to the Research Department, National Bank Belgium, since 2012
CEPR Research Fellow – International Macroeconomics Program since 2013
Head of the Econometric Modelling Division, National Bank Belgium, 2003-2012
Visiting Scholar Economic Modelling Division, Research Department IMF, January 2003, July 2004
Advisor, Directorate General Research, European Central Bank, Frankfurt, 2000-2001
Deputy Adviser, member of the Econometrics Modelling Division, Research Department, National Bank of Belgium, 1989-1999
Research Assistant, Hoger Instituut Voor de Arbeid, KULeuven, 1987-1989
Research Assistant, Centrum voor Economische Studiën, KULeuven 1984-1986
Research Assistant, Hoger Instituut Voor de Arbeid, KULeuven, 1983

**Teaching:**

Maitre de conference, Ecares - ULB since 2012 (Course Graduate Macro II)
Visiting Professor, KUL, 2012-2020 (Course: Advanced Macroeconomics II)
Chargé de Cours, Département des Sciences Economique, UCL 2005-2012 (Course Monetary Economics)
HEC-St.Louis - Brussels 1995-1997 (Course Economic Fluctuations)

**Research Interests:** DSGE models, Monetary Economics, Macroeconomics

**Current Research Topics:**

Estimation of macromodels with a Zero Lower Bound (with J. Maih and J. Lindé).

Estimation of DSGE models with adaptive learning including observations from survey forecasts on inflation and other macroeconmic variables (with S. Slobodyan, Y. Rychalovska).

Review of reduced form empirical evidence on the non-linearity of macro-financial interactions (projects with F. De Graeve).

Development and estimation of integrated macro-finance models with endogenous risk and occasionally binding financial constraints.

**Refereed Academic Publications and Chapters**

“Challenges for Central Banks’ Macro Models” (with Jesper Lindé and Frank Smets), Chapter 28, Handbook of Monetary Economics 2016, Ed. J. Taylor and H. Uhlig, Elsevier.
(also published as CEPR Discussion Papers 11405).

“Professional forecasters and real-time forecasting with a DSGE model” (joint with Frank Smets and Anders Warne), *International Journal of Forecasting*, 30 (2014) 981–995

"Endogenous risk in a DSGE model with capital-constrained financial intermediaries" (joint with Hans Dewachter), *Journal of Economic Dynamics and Control*, Vol 43, June 2014, Pages 241–268.

"Slow Recoveries: A Structural Interpretation" (joint with Jordi Galí and Frank Smets), *Journal of Money, Credit and Banking*, Volume 44, 2012, p. 9-30.
(also published as CEPR Discussion Papers 8978, May 2012).

"Learning in a Medium-Scale DSGE Model with Expectations Based on Small Forecasting Models" (joint with Sergey Slobodyan), *American Economic Journal: Macroeconomics*, Volume 4(2), 2012, p. 65-101.

"Unemployment in an Estimated New Keynesian Model" (joint with Jordi Gali and Frank Smets), *NBER Macroeconomics Annual 2011*, Volume 26 National Bureau of Economic Research, Inc.
(also published as CEPR Discussion Papers 8401, C.E.P.R. Discussion Papers.

"Learning in an estimated medium-scale DSGE model" (joint with Sergey Slobodyan), *Journal of Economic Dynamics and Control*, Volume 36(1), 2012, p. 26-46.

"Risk premiums and macroeconomic dynamics in a heterogeneous agent model" (joint with Ferre de Graeve, Maarten Dossche, Marina Emiris and Henri Sneessens), *Journal of Economic Dynamics & Control*, Volume 34, 2010, p. 1680–1699

"Sequential bargaining in a New Keynesian model with frictional unemployment and staggered wage negotiation" (joint with Gregory de Walque, Olivier Pierrard and Henri Sneessens), *Annales d'Économie et de Statistique*; N° 95/96, July/December 2009, p. 223-250.

"A structural decomposition of the US yield curve" (joint with Ferre De Graeve, Marina Emiris), *Journal of Monetary Economics*, Volume 56, Issue 4, May 2009, p. 545-559.

"A note on inflation persistence in a fair wage model of the business cycle" (joint with David de la Croix, Gregory de Walque), *Macroeconomic Dynamics*, March 2009.

"On the fit and forecasting performance of New-Keynesian Models" (joint with Marco Del Negro, F. Schorfheide, F. Smets), *Journal of Business and Economic Statistics*, 2007.

"Shocks and frictions in US business cycles: a Bayesian DSGE approach" (joint with F. Smets), *American Economic Review* (June 2007),

"Firm-specific production factors in a DSGE model with Taylor price setting" (joint with Gregory de Walque and Frank Smets), *Journal of International Central Banking*, 2006

"Price shocks in General Equilibrium: Alternative Specifications" (with G. de Walque and F. Smets), *CESifo Economic Studies*, 2006.

"Bayesian New Neoclassical Synthesis (NNS) Models: Modern Tools for Central Banks" (with F. Smets), *Journal of the European Economic Association*, 2005, 3(2-3), p.422-433.

"Comparing shocks and frictions in US and euro area business cycles: a Bayesian DGSE approach" (with F. Smets), *Journal of Applied Econometrics*, 2005, 20(2), p.161-183.

"Forecasting with a Bayesian DSGE model: an application to the euro area" (with F. Smets), *Journal of Common Market Studies*, 2004.

"An estimated dynamic stochastic general equilibrium model of the euro area" (with F. Smets), *Journal of the European Economic Association*, September 2003, 1(5), p.1123-1175.

"Openness, imperfect exchange rate pass-through and monetary policy" (with F. Smets), *Journal of Monetary Economics* (Carnegie Rochester Series) 2002(49), p.947-981.

"The exchange rate and the monetary transmission mechanism in Germany" (with F. Smets), *De Economist*, 1999.

"Interest rates and household absorption in Belgium" (with M. Dombrecht), *Journal of Policy Modeling*, no. 2, April 1997, p. 129-152.

"An asset market model for the Deutschmark-Belgian franc exchange rate" (with M. Dombrecht), *Economic & Financial Computing*, no. 3, Fall 1992, p. 151-167.

**Other Publications**

Discussion on "Labour tax reforms, cross-country coordination and monetary policy stance" of Jacquinot, Lozej and Pisani, International Journal of Central Banking, Vol. 14, n° 3, June 2018.

Discussion of "Policies to rebalance the global economy after the financial crisis" by Charles Freedman, Michael Kumhof, Douglas Laxton and Dirk Muir, *International Journal of Central Banking*; March 2010, Vol. 6, n° 1.

"An open Economy DSGE Model linking the Euro Area and the US economy" (joint with Gregory de Walque), in *Exchange rates and macroeconomic dynamics* edited by P. Karadeloglou and V. Terraza, 2008.

**Working Papers**

"Low pass-through and high spillovers in NOEM : What does help and what does not" (with Gregory de Walque, Thomas Lejeune, Ansgar Rannenberg), Working Paper Research 386, National Bank of Belgium, 2020.

"A macroeconomic model with heterogeneous and financially-constrained intermediaries" (with Thomas Lejeune), Working Paper Research 367, National Bank of Belgium, 2019.

"An estimated two-country EA-US model with limited exchange rate pass-through" (with Gregory De Walque, Thomas Lejeune, Yuliya Rychalovska), Working Paper Research 317, National Bank of Belgium, 2017.

"The transmission mechanism of new and traditional instruments of monetary and macroprudential policy," Economic Review, National Bank of Belgium, issue iii, pages 105-117, December 2016.

"Forward guidance and long term interest rates: Inspecting the mechanism" (with Ferre De Graeve and Pelin Ilbas), Sveriges Riksbank Working Paper Series, Issue 292, 2014.

"Professional forecasters and the real-time forecasting performance of an estimated new Keynesian model for the euro area" (with Frank Smets and Anders Warne), ECB Working Paper No. 1571, 2013.

"Risk premiums and macroeconomic dynamics in a heterogeneous agent model" (with Ferre De Graeve, Maarten Dossche, Marina Emiris and Henri Sneessens), NBB-WP 200810-25.

"Sequential bargaining in a new-Keynesian model with frictional unemployment and staggered ware negotiation" (with Gregory de Walque, Olivier Pierrard and Henri Sneessens), ECB-WP 1007.

"On the fit and forecasting performance of New-Keynesian Models" (joint with Marco Del Negro, F. Schorfheide, F. Smets), Working Paper ECB 2005 (no. 491), CEPR Discussion Paper 2004 (No 4848).

"Technical note on the estimation procedure for the Belgian yield curve" (joint with M. Dombrecht), BIS Papers No. 25 (2005).

"Deteminanten van de debetrentes toegepast door Belgische kredietinstellingen" (with A. Bruggeman), *NBB Working Paper* No 15 (2001).

"Model-based inflation forecasts and monetary policy rules" (with M. Dombrecht), *NBB Working Paper*, February 2000.

"A structural VAR approach to core inflation and its relevance for monetary policy" (with L. Aucremanne), In : *Measures of underlying inflation and their role in the conduct of monetary policy*, Workshop Proceedings, BIS Basle, June 1999, 44 p.

"Fiscal consolidation in general equilibrium models", In : *Topics in monetary policy modelling*, BIS - Conference Papers 6, August 1998, p. 48-90.

"Interpretation of the information content of the term structure of interest rates" (with M. Dombrecht), in : *The role of asset prices in the formulation of monetary policy*, BIS - Conference Papers 5, March 1998, p. 92-115.

"On the determination of long-term interest rates and exchange rates" (with M. Dombrecht), in : *The determination of long-term interest rates and exchange rates and the role of expectations*, BIS - Conference Papers 2, August 1996, p. 100-121,

"The interest rate policy transmission process in Belgium" (with V. Perilleux), In : *National differences in interest rate transmission*, BIS Basle, 1994, p. 47-62.

"Changes in the business cycle and their implications for monetary policy" (with M. Maréchal), In : *Changes in the business cycle and the implications for monetary policy*, BIS Basle, 1993, p. 45-62.

"International capital mobility and exchange rate policy in Belgium" (with M. Dombrecht and P. Petit), In : *International capital flows, exchange rate determination and persistent current-account imbalances*, BIS Basle, 1990, p. 38-60.

"Asset substitutability and European monetary integration" (with M. Dombrecht, G. Lejeune), In : *De Pecunia*, 1990, no. 2-3, p. 397-414.

"The efficiency of regional subsidy policies under a national budgetary restraint" (with P. Van Rompuy and G. De Bruyne), in M. Chatterji and R.E. Kuenne (eds.), *New Frontiers in regional science*, McMillan London, 1990, p. 294-306.

"The economic feasibility of regional subsidy policies" (with P. Van Rompuy and G. De Bruyne), in P. Friedrich and P. Van Rompuy (eds.), *Fiscal decentralisation*, Nomos Verlagsgesellschaft, Baden-Baden, 1987, p. 134-154.

## Work in Progress - Unpublished Papers

"Estimation of Operational Macromodels at the Zero Lower Bound" with Junior Maih and Jesper Lindé.

"Adaptive Learning and Survey Information on Expectations", with Sergey Slobodyan.

"Restricted Perceptions, Regime Switches and the Effective Lower Bound" with Tolga Ozden.

"Risk and State-Dependent Financial Frictions", with Martin Harding.

"An open economy DSGE model linking the Euro Area and the US economy" (joint with G. de Walque and F. Smets), 2005

"Inflation dynamics in general equilibrium" (joint with G. de Walque and F. Smets).

"Output gaps: Theory versus practice" (with F. Smets)

"Welfare analysis of non-fundamental asset price and investment shocks: implications for monetary policy" (with F. Smets)

## Publications in Dutch

"Omvang van de collectieve sector en draagvlak van de economie", *De Gids op Maatschappelijk Gebied*, 1988, no. 11, p. 800-814.

"Het profijt van de non-profit : de economische betekenis van de gezondheids- en welzijnszorg ; onderzoeksrapport", Koning Boudewijn Stichting Brussel, 1988, 241 p.

"Gezins- en inkomensaspecten van de kostenbeheersing in de medische consumptie in België" (with J. Pacolet), in J. Pacolet and I. Nicaise (eds.), *Draagkracht, sociale zekerheid en personenbelasting*, Hiva KULeuven, 1986, p. 153-185 (also published in Acta Hospitalia, 1986, no. 4, p. 5-22).

"Regionale subsidiering in een economische en monetaire unie" (with P. Van Rompuy and G. De Bruyne), *Documentatieblad - Ministerie van Financiën*, 1985, no. 9, p. 27-39.

## Presentations & discussions at Conferences, Workshops and Seminars since 2000

2020: Discussion at "Secular Stagnation, Low Interest Rates and Low Inflation: Causes and Implications for Policy", Conference EC, CEPR and JEDC, 4-6 November 2020, Brussels
Discussion at the 3rd Bank of Canada FSRC Macro-Finance Conference, September 24-26, 2020

2019: Presentation of "Survey Expectations and Adaptive Learning", at Czech National Bank Conference, May 16-17, "Macro-modelling workshop on global and cross-country spillovers" at EC-workshop (November 29-30), Discussion at the SNB-FRB-BIS High-Level Conference on "Global Risk, Uncertainty, and Volatility" (November 12-13)

2018: seminar Durnham University April 24, Bilbao Conference on "Adaptive Learning" May 7-8, Cleveland Fed Conference on "Inflation: Drivers and Dynamics" May 17-18, Conference Norges Bank "Estimation of Operational Macromodels at the ZLB" January 26-27, Discussion of "The optimal inflation target and the natural rate of interest" by P. Andrade, J. Gali, H. Le Bihan, J. Materon, Banque de France, January 31, Organizing CEPR International Macro & Finance Conference in Auditorium NBB November 15-16

2017: EABCN-Conference EUI-Florence 8-9 June, Conference of IJCB Prague 19-20 June, Seminar University of Antwerp, Seminar Bank of Finland and Helsinki Center of Economic Research

2016: Bank of Canada Conference, Seminar Czech National Bank, Seminar Paris-Dauphine, Invited speaker Dynare conference-Rome, Conference University of Maine Le Mans, Conference Bank of Italy, FP7-conference MacFinRobods Brussels, Learning workshop Utrecht

2015: Central Planning office Den Haag, Bilbao University, European Commission Conference, Chicago Handbook conference, Rennes University, Bank of Italy Conference, Bundesbank-Banque de France conference, Louvain-la-Neuve Belgian Macro day,

2014: EABCN-conference Cambridge, ECB Forecasting conference, CEF-conference Oslo, Banque de France Conference, MMF Durham

2013: De Nederlandsche Bank conference, Gent University Macro workshop, Essim-Izmir, KUL-macro-day, St Andrews workshop, Riksbank, NB of Serbia, SwissNB

2012: Banque de France, New York Fed, EC-workshop, IMF-Bank of Turkey-conference, Ecares20, ECB-workshop, Gent-university-workshop, Breugel seminar, Namur-workshop, NBB-colloquium

2011: WGEM, Workshop Frankfurt Goethe University, Riskbank, Norges Bank, EABCN-Florence, SNB-Zurich, SNB-Gerzensee, University Namen, SED-Ghent

2010: Presentation Banque de France conference, Seminar European University Institute, discussion DG ECFIN-ULB-UBC conference Brussels, discussion Erasmus University Rotterdam, seminar University Antwerp, presentation Conference University of Oslo

2009: Seminar Maastricht University, San Francisco Federal Reserve Conference, Seminar Norges Bank, EABCN-ECB workshop, Seminar Ecares, Discussion Banca d'Italia conference, WGEM-Ljubjlana, Banque de France Conference, ECB Handbook Conference, IJCB-conference Paris, CEPR-Magyar Nemzeti Bank Conference, ECB-MTM conference, University Nottingham

2008: Seminar Erasmus University, Banca d'Italia - Conference, Seminar Toulouse University, Bank of Finland workshop, CEF-Paris, Banque de France Conference, Seminar Breugel, ECB-Conference, Strasbourg Conference

2007: CERGE-EI seminar, 8th Annual Bank of Finland/CEPR Conference on "Expectations and Business Cycle Dynamics", Bank of Norway, 3e Dynare conference, SCE-Conference-Montreal, Seminar at Banco de Portugal, Seminar at Universiteit Antwerpen, Seminar at De Nederlandsche Bank; Discussions: CREI, UPF Conference on "How much Structure in Empirical Models", Barcelona; 8th Annual Bank of Finland/CEPR Conference on "Expectations and Business Cycle Dynamics"; Banque de France Workshop on DSGE models; SNB Research Conference, Zurich; Session Organizer at the International Conference on "New Challenges in Economic Research", Economics School of Louvain.

2006: CEPR-ECB Labour Market Workshop, "Wage and Labour Cost Dynamics", ECB; DSGE-Forum; Workshop "Practical issues in DSGE modelling at central banks" - Bank of Finland;

Workshop "Structural analysis of business cycles in the open Economy", Sveriges Riskbank; Discussions: 17th EC2 Meeting, Rotterdam; EABCN - CEPR - Swiss National Bank workshop.

2005: "Policy relevant Modeling for Central Banks" - 4th Conference Bank of Canada - FRB of Cleveland - SNB, Zurich; EEA Annual Congress - Amsterdam; Society of Computational Economics, Washington; Conference "Economy Policy, Growth and Business Cycles - Ghent; Workshop "Monetary models and aggregate Dynamics" - Banque de France; Workshop "Estimated DSGE Models for Monetary Policy Analysis" - Bank of England; Discussions: Second Workshop on Central Bank Policy Modelling organized by the Research in Finance and Management, FUNDP, University of Namur; ECB/IMOP 3rd Workshop on Dynamic Macroeconomics, Hydra; Colloquium 50 jaar CES, Leuven; Workshop "Estimated DSGE Models for Monetary Policy Analysis" - Bank of England; Conference "Macroeconomics and Reality 25 years later" Barcelona.

2004: "SDGE Models and the financial sector" Joint Workshop Deutsche Bundesbank and the TU Darmstadt - Eltville; Workshop on "Empirical Methods and Implication for Dynamic stochastic General Equilibrium Models" - Federal Reserve bank of Cleveland; 10th International conference on the Society for Computational Economics - University of Amsterdam; VI Louvain Symposium on Economic Dynamics, Louvain-la-Neuve; Inflation Dynamics-General Equilibrium Workshop in Helsinki, Bank of Finland; ECB/IMF Workshop, Global Financial Integration.

2003: First Conference Euro Area Business Cycle Network - CEPR, ECB Frankfurt; Seminar ULB-Ecares; BIS Autumn Economists' Meeting; Annual Conference of the Society for Computational Economics, Seattle; Workshop on Macroeconomic Modelling, De Nederlandsche Bank, Amsterdam; First ECB/IMOP Workshop on Dynamic Macroeconomics, Hydra, Greece; Workshop on Small Structural Models for Monetary Policy Analysis Progress, Puzzles and Opportunities, Stockholm, Riksbank; Applied Workshop on DSGE Models, Helsinki, Bank of Finland; First Workshop Euro Area Business Cycle Network - CEPR, Madrid; Seminar CES-KUL; Seminar IMF Research Department; American Economic Association Winter Meeting, Presentation in the session "Monetary policy in fully-specified Macro-Models";

2002: Seminar at the Federal Reserve Board; International Seminar on Macroeconomics, Frankfurt; Annual Conference of the Federal Reserve Bank of San Francisco, Macroeconomic Models for Monetary Policy; Discussant at the Central Bank Workshop on Macroeconomic Modelling, Federal Reserve Board.

2001: Workshop on DSGE models and their use for monetary policy, ECB, June 2001
ECB-seminar; Conference on Monetary Policy in Open Economies, Bank of Norway.

2000: ECB-Seminar; Discussant at the Workshop on inflation targeting and exchange rate fluctuations, Sveriges Riksbank.

**Referee reports:** Econometrica, AER, RES, JME, JEDC, JEEA, JAE, JMCB, JE, EL, EJ, JED, Open Economies Review, Louvain Economic Review, IJCB

**Doctoral Committees:** KULeuven (3), UGent (6), ULB (4), UCL (2), Antwerp University (2), Namur, VU-Amsterdam, Toulouse, Paris Cergy-Pontoise, Paris Évry, Paris I Panthéon-Sorbonne (2), Rennes, Strassbourg, University of Paris, CERGE-EI Prague, Surrey, Université Liége

**Organisation** of NBB-Conferences, CEPR-conferences, Joint Macroeconomic Seminars with KUL-ULB-UCL-UA-UGent-ULiège-UNamur, Ph.D. training courses at NBB, Sofie Ph.D. courses, EABCN-workshops and training Schools at NBB