

Timothy Munday

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Nuffield College, 1 New Road, Oxford, OX1 1NF, UK

EDUCATION

- 2019 - 2022 PhD (DPhil) in ECONOMICS, **University of Oxford, Nuffield College**
Research agenda: Central Bank Communication, Text Analysis, Machine Learning
Advisor: Prof. Michael McMAHON
- 2017 - 2019 Master of Philosophy in ECONOMICS, **University of Oxford, Nuffield College**
Distinction | Ranked second in First year exams out of 70 students
Ranked 1st in Microeconomics
Given unconditional offer for PhD program
- 2012 - 2015 Bachelor of Arts in ECONOMICS, **University of Cambridge**
Double first | Ranked 3rd out of 170 students

EMPLOYMENT

- 2019 - 2021 Visiting Academic, and summer PhD Intern **Bank of England** | Manager: David BHOLAT
Worked in the Advanced Analytics division, using machine learning techniques to answer economic questions
Produced a Bank of England Working Paper on Central Bank Communication using NLP and a Bank Underground Blog post on heterogenous firm responses to the COVID-19 crisis both using very large datasets
- Separately spent three months in the External Engagements division writing a paper on high frequency identification window lengths.
- 2019 - 2021 Undergraduate teaching, **St Hughes College, Oxford**
Second year macroeconomics and quantitative economics small group teaching
- 2018 - 2019 Research Assistant and Software Developer, **Econ-Ark** | Manager: Prof. Chris CARROL
Helped develop tools to solve heterogenous agent models for <https://econ-ark.org/>
- 2018 - 2018 Summer Researcher, Open Source Macroeconomics Lab, **University of Chicago**
- 2015 - 2017 Economist, **Goldman Sachs**, London | Manager: Huw PILL
Produced high quality written economic research on a variety of topics, publishing new research to clients every two weeks.
These included pieces forecasting bank lending costs, estimating the pass through of exchange rate movements to prices and identifying the effects of minimum wage laws across European borders on unemployment.
Wrote the Goldman Sachs Annual European Economic Outlook

SELECTED RESEARCH

WORKING PAPER **Central Bank Communication and Higher Moments**
How does central bank communication affect the distribution of expected policy rates? Much of the literature on central bank communication has focused on how communication impacts the conditional expected mean of future policy. This paper asks how central bank communication affects the second and third moments of the financial market's perceived distribution of future policy decisions. I use high frequency changes in option-prices around Bank of England communications to show that communication affects higher moments of the distribution of expectations. I find that the relevant communication in the case of the Bank of England is primarily confined to the information contained in the Q&A and Statement, rather than the longer Inflation Report. In the case of the second moment, I provide evidence to support Morris and Shin (2002)'s model of central bank communication.

JOB MARKET PAPER **Mark My Words: Central Bank Communication to the General Public via the Print Media** | Joint with James Brookes
We ask how central banks can change their communication in order to receive greater newspaper coverage. We write down a model of news production and consumption in which news generation is endogenous because the central bank must draft its communication in such a way that newspapers choose to report it, whilst still retaining the message the central bank wishes to convey to the public. We use our model to show that standard econometric techniques that correlate central bank text with measures of news coverage in order to determine what causes central bank communication to be reported on will likely prove to be biased. We use computational linguistics combined with an event-study methodology to measure the extent of news coverage a central bank communication receives, and the textual features that might cause a communication to be more (or less) likely to be considered newsworthy. We consider the case of the Bank of England, and estimate the relationship between news coverage and central bank communication implied by our model. We find that the interaction between the state of the economy and the way in which the Bank of England writes its communication is important for determining news coverage. We provide concrete suggestions for ways in which central bank communication can increase its news coverage by improving readability in line with our results.

WORK IN PROGRESS **Variation of Coefficient: Monetary Policy Shocks with Time-Varying Uncertainty** | Joint with Michael McMahon

NOV 2020 **When bigger isn't better: UK firms' equity price performance during the Covid-19 pandemic**, *Bank Underground*

AUG 2020 **What will the shape of the recovery tell us about the best policy response?** *Economics Observatory*

JUNE 2020 **How much will lifting lockdown start to reverse the UK's economic slump?** *Economics Observatory*

NOV 2016 **Europe's outlook: A fiscal fillip sustains the modest recovery**, *Goldman Sachs*
I was solely responsible for producing the annual Goldman Sachs European macroeconomic outlook. I analysed the support afforded to Euro area growth from easier fiscal policy and labour reforms and flagged and discussed upcoming political risks such as the French elections. The report included a variant scenario analysis on our forecasts using a large-scale DSGE model.

OCT 2016 **Incorporating the long term unemployed into the NAIURU**, *Goldman Sachs*
I developed a state-space model to estimate the NAIURU as a latent variable and adjusted for the fact that the long term unemployed exhibit less pressure on wage formation. I found that slack is materially larger in the Euro area when calculating a duration-weighted NAIURU.

2015 - 2017 **Multiple research pieces published at Goldman Sachs on European inflation, labour markets and Central Banks**

DEC 2015 **Why did Europe experience uneven growth after the financial crisis?**, *World Economic Forum*
Also published as: Accounting for differences in Europe's post-Crisis growth, *VoxEU*

SCHOLARSHIPS AND AWARDS

- APRIL 2021 David Walton Distinguished Scholarship | One year of full postgraduate funding
- JUNE 2019 Jerry Hausman Scholarship | Two years of full postgraduate funding
- JUNE 2019 George Webb Medley Prize (proxime accessit) | Awarded for second place in MPhil exams
- JULY 2018 Open Source Macroeconomics studentship worth \$4200
- SEPT 2017 ESRC Grand Union DTP funded studentship | Four years of full postgraduate funding
- JUNE 2016 Shortlisted for the Society of Professional Economists Rybczynski Prize for economic writing for research done at Goldman Sachs
- JUNE 2015 Schuldham Plate | Awarded to the top graduating student in the college
- JUNE 2015 Evanthia Sofianou Prize | Awarded to the top final year economist in the college
- JUNE 2014 Senior Scholarship | Awarded for first class marks in second year exams
- JUNE 2013 Scholarship | Awarded for first class marks in first year exams
- JUNE 2013 Stanley Denison Prize | Awarded to the top first year economist in the college

COMPUTER SKILLS

- Advanced Knowledge: PYTHON: I use python for most of my analytical work. I have good knowledge of the gensim library for text analysis and scikit-learn and tensorflow/keras for machine learning. I have experience using cloud based services for large projects using Azure.
- Working Knowledge: MATLAB, R, STATA

CONFERENCE PRESENTATIONS

- 2020 Royal Economic Society 2020 (cancelled due to COVID), Bank of England PhD Intern Conference, Advanced Analytics Bank of England invited presentation, Warwick PhD Conference 2020
- 2021 NUCAMP 2021 Conference, AEA (upcoming), Advanced Analytics: New Methods and Applications for Macroeconomic Policy organised by Kings College London (upcoming)

OTHER WORK

- MARCH 2020 Book review for the Oxford University Press on "A tale of two decades: the ECB's monetary policy at 20"
- APRIL 2020 Program Committee for the 2020 Nuffield Applied Macroeconomic Conference
- 2021 Referee for Oxford Bulletin of Economics and Statistics