

# MAGNUS HANSSON

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## EDUCATION

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**University of Gothenburg**  
*PhD Economics*

**September 2017 - June 2023**  
*Gothenburg, Sweden*

- Primary research areas: Decentralized finance; Applied machine learning
- Visiting PhD student at Stockholm School of Economics
- Advisors: Professors [Erik Hjalmarsson](#) and [Andreas Dzemski](#)

**Lund University**  
*MSc Economics*

**September 2016 - June 2017**  
*Lund, Sweden*

- Thesis: “On stock return prediction with LSTM networks”

**Lund University**  
*BSc Mathematics*

**September 2014 - June 2017**  
*Lund, Sweden*

- Thesis: “Feedforward neural networks with ReLU activation functions are linear splines”

**Jönköping University**  
*BSc Economics*

**September 2011 - June 2014**  
*Jönköping, Sweden*

- Thesis: “Do thicker labor markets produce more matches?”
- Exchange semester at University of St.Gallen
- Scholarship for top 5% GPA

## WORK EXPERIENCE

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**Combine Control Systems**  
*Data science engineer*

**September 2017 - August 2018**  
*Gothenburg, Sweden*

- Artificial neural network modelling for virtual engine testing
- Building a data analysis pipeline

**Jönköping University**  
*Research Assistant*

**April 2016 - November 2016**  
*Remote*

- Programming a GARCH-Copula framework in R.

**Nordea Bank**  
*Analyst*

**Summers 2012, 2013, 2014**  
*Gothenburg, Sweden*

- Summer analyst at corporate retail.

## TECHNICAL STRENGTHS

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**Methods**  
**Computer Languages**  
**Tools**

Econometrics, Machine Learning, NLP, Numerical Analysis  
Python, Julia, R, Matlab, Bash, JavaScript, Stata  
Linux/Unix, Vim/Neovim, L<sup>A</sup>T<sub>E</sub>X

## PRESENTATIONS

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Computational and Financial Econometrics	<i>King's College London, 2021</i>
Machine Learning meets Econometrics (MLECON)	<i>Virtual, 2021</i>
GU Finance Seminar	<i>University of Gothenburg, 2021; 2022</i>
GU PhD Conference	<i>University of Gothenburg, 2021; 2022</i>

## TEACHING EXPERIENCE

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PhD Micro I	<i>Teacher Assistant 2019-2021, University of Gothenburg</i>
MSc Financial Econometrics	<i>Teacher Assistant 2019-2022, University of Gothenburg</i>
MSc Intro Matlab	<i>Teacher 2019-2022, University of Gothenburg</i>
BSc Thesis Advisor	<i>Teacher 2021, University of Gothenburg</i>

## DISSERTATION CHAPTERS

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### **“Arbitrage in crypto markets: An analysis of primary Ethereum blockchain data”:**

This paper shows how arbitrageurs contribute to price efficiency on the Ethereum blockchain. Traders are likely to observe the market price on decentralized exchanges as price anomalies are immediately arbitrated away. Exchange rates from decentralized exchanges are used as reference prices and I show that these are most often arbitrage-free. I collect a transaction-level dataset of primary data from the Ethereum blockchain and cleanly classify a set of completed cross-exchange and triangular arbitrages, spanning 4,663 cryptocurrency trading pairs. Alternative orderings of the transaction history are simulated, showing that arbitrage profits are time sensitive and disappear quickly when reordered. A regression of arbitrage profits on deviations from the no-arbitrage price, shows that most profits are made from exchange rate changes from trading immediately prior to the arbitrages.

### **“Evolution of topics in central bank speech communication”:**

This paper studies the content of central bank speech communication from 1997 through 2020 and asks the following questions: (i) What global topics do central banks talk about? (ii) How do these topics evolve over time? I turn to natural language processing, and more specifically Dynamic Topic Models, to answer these questions. The analysis consists of an aggregate study of nine major central banks and a case study of the Federal Reserve, which allows for region specific control variables. I show that: (i) Central banks address a broad range of topics. (ii) The topics are well captured by Dynamic Topic Models. (iii) The global topics exhibit strong and significant autoregressive properties not easily explained by financial control variables.