Economic Data Science

Dr. Sebastian Wichert,
Head of Research Data Center (EBDC)
ifo Institute, Munich
### Our mission: Shaping the economic debate

#### Key themes
- Economic growth and sustainability
- Digital transformation of the economy
- Public sector function and taxation
- European integration, globalization and inter-system competition
- Equality of opportunity and integration

#### Key facts
- Leading German economic research institute on research performance, media coverage and policy impact
- Non-profit organization + connection to LMU Munich
- Headed by Prof. Dr. Clemens Fuest
- 9 research areas + research data center
- approx. 220 employees
ifo is a leading economic research institute in Germany

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**Key themes**

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- int
- Eq
Economics and (Big) Data Science – a long history until today
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ifoCast – ML-based Back-, Now- and Forecasting

Change compared to previous quarter in %, price-, seasonal-, and calendar-adjusted

- 3.0%
- 2.0%
- 1.0%
- 0.0%
- -1.0%
- -2.0%
- -3.0%

07.11. 24.11. 07.12. 18.12. 09.01. 25.01. 07.02. 23.02. 08.03. 22.03. 08.04. 24.04.

GDP forecast
Labor market
New orders
International
Production
Revisions
Surveys
Turnover
National accounts

Forecast uncertainty: 90% interval based on forecast distribution.
Source: ifoCAST; calculations by the ifo Institute, as of: 23.02.2024
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A Novel Trade Agreement Database

**Starting point:** Existing official trade data is massively flawed

Tariff data is granular and complex:

- **160 x 159 x 5,000 x 30 = 5.6 bn observations**
- Tariff, trade, sanction documents = Legal docs with mix of tables, text in different languages

**Methods:** Web-scraping, NLP methods (structural topic models, text similarity), K-clustering, LASSO, causal inference

**Result:** Trade elasticities are highly sensitive to messy data
Measuring collaboration and the (still existing) role of distance using GitHub
New economic geography and consumption expenditures in cities

Change in credit card expenditures 2019 vs. 2022

Source: Mastercard GeoInsights; Calculations by ifo Institute.
Working from home and the market for office space in Germany

![Bar chart showing empty office space in Germany from 2018 to 2023. The chart indicates a steady increase in empty office space, with a significant rise in 2023. Source: Colliers; Calculations by ifo Institute.](chart.png)
Less mobility in areas with more working from home potential

Source: Mobile phone-based mobility data from Deutsche Telekom and working from home potential by infas360. Calculations by ifo Institute. #depatures per month on postcode level.
Several more studies

The deterrent effects of arrests in domestic violence cases (using UK police and emergency call data)

Measuring the effects of climate protests on elections (using i.a. mobility/location data)

The effects of different forms of custody (using Swedish court records)

HR studies using employee data (of course in a GDPR compliant way):

• Fostering psychological safety in teams using field experiments – benefits and measures
• Explaining talent hoarding in firms (and how to avoid it) using team evaluations and survey evidence
• Addressing female underrepresentation in leadership positions using internal job board data

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Economic Research together with Firms – a Great Opportunity

Initial situation

- **Official statistics not sufficient:** Many (time-critical) questions cannot be answered with official statistics or surveys → *Data is not available at all, too late, or not detailed roughly*

- **Big Data:** Digitization creates "big data" (= huge, unconventional, often unstructured data) in business processes at companies

- **Long-standing expertise:** Economic researchers (@ifo and beyond) are proficient in data analysis and the application of state-of-the-art econometric methods
  + connections to other sciences

Research cooperation with firms

- **Creating a win-win situation:** Cooperation projects that bring together company data and economic, methodological expertise lead to mutual benefits for companies and science

- **Cooperation in new areas:** Pilot projects and long-standing in new fields apart from engineering, direct product development, and marketing is possible - even in (privacy-sensitive) Germany.
Cooperation between Science and Industry – Why and How?

Possible goals & requirements for science:
- Evidence-based scientific research that feeds into policy advice and public debate
- Connection to the world's leading research
- Utilizing synergy effects of the business and science location

Possible goals of business partners:
- Generate new insights to optimize business processes
- Knowledge transfer
- Recruitment data scientists
- CSR/ESG ("Data for good")/Avoiding stronger regulations
- Good PR through joint studies and press

Process:
- Joint development of research questions and, if necessary, regular coordination rounds
- Open-ended and independent research
- Cooperation always on a contractual basis, confidentiality agreement and data protection check + if necessary, anonymization and data processing only in a secure working environment
Initiatives to foster collaboration between science and industry

Take your chance and collaborate with science!
JOIN OUR TEAM!  
Applied Data Scientist/ PostDoc (f/m/d)  
Big Data Economics  

Shaping the Economic Debate
THANK YOU!

wichert@ifo.de

www.linkedin.com/in/sebastianwichert
THANK YOU FOR YOUR ATTENTION!

Dr. Sebastian Wichert

E-Mail: wichert@ifo.de
LinkedIn: www.linkedin.com/in/sebastianwichert
Personal website: https://sites.google.com/view/sebastianwichert/home
ifo website: https://www.ifo.de/en
References I
ifo/LMU researchers in bold

- Slide 5 - ifoCast: [https://www.ifo.de/en/ifoCAST](https://www.ifo.de/en/ifoCAST)
- Slide 6 - Tariff data Feodora Teti, 30 Years of Trade Policy: Evidence from 5.7 Billion Tariffs, mimeo
- Slide 7 - GitHub data: Moritz Goldbeck, *Bit by Bit - Colocation and the Death of Distance in Software Developer Networks*
- Slide 8 – Mastercard GeoInsights + Infas360 data: Victor Alipour, Oliver Falck, Simon Krause, Carla Krolage, Sebastian Wichert, *The Future of Work and Consumption in Cities after the Pandemic: Evidence from Germany*
- Slide 10 - Telekom mobility data: Unpublished analysis for project „The Future of Work and Consumption in Cities after the Pandemic: Evidence from Germany“ (see slide 8)
References II
ifo/LMU researchers in bold

• Slide 11:
  • Sofia Amaral, Gordon B. Dahl, Victoria Endl-Geyer, Timo Hener, Helmut Rainer, Deterrence or Backlash? Arrests and the Dynamics of Domestic Violence
  • Marc Fabel, Matthias Flückiger, Markus Ludwig, Helmut Rainer, Maria Waldinger, Sebastian Wichert, The Power of Youth: Did the "Fridays for Future" Climate Movement Trickle-Up to Influence Voters, Politicians, and the Media?
  • Stella Canessa, Anna Hasselqvist, Helmut Rainer, Joint versus Sole Custody after Divorce: Causal Effects on Child Outcomes and Family Environment
  • Silvia Castro, Florian Englmaier, Maria Guadalupe, Fostering Psychological Safety in Teams: Evidence from an RCT, mimeo
  • Ingrid Hägele, Talent Hoarding in Organizations
  • Ingrid Hägele, The Broken Rung: Gender and the Leadership Gap

• Slide 14:
  • CESifo Cluster “Economic Research with Firm Data”
  • Predictive People Analytics (PPA)
  • KonsortSWD project “New Options for Access to Firm Data”
  • BERD@NFDI Data Marketplace
  • NFDI Section “Industry Engagement”
  • Datagroup Business 2 Science