

Digitalization and the Future of Work: Macroeconomic consequences for tomorrow's employment, unemployment and wages

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Panel 4 – Employment forecasts and the digital, green
and demographic transitions

A „Jobless Future“?



Der Spiegel, 17.4.1979



Der Spiegel, 3.9.2016

Research Questions

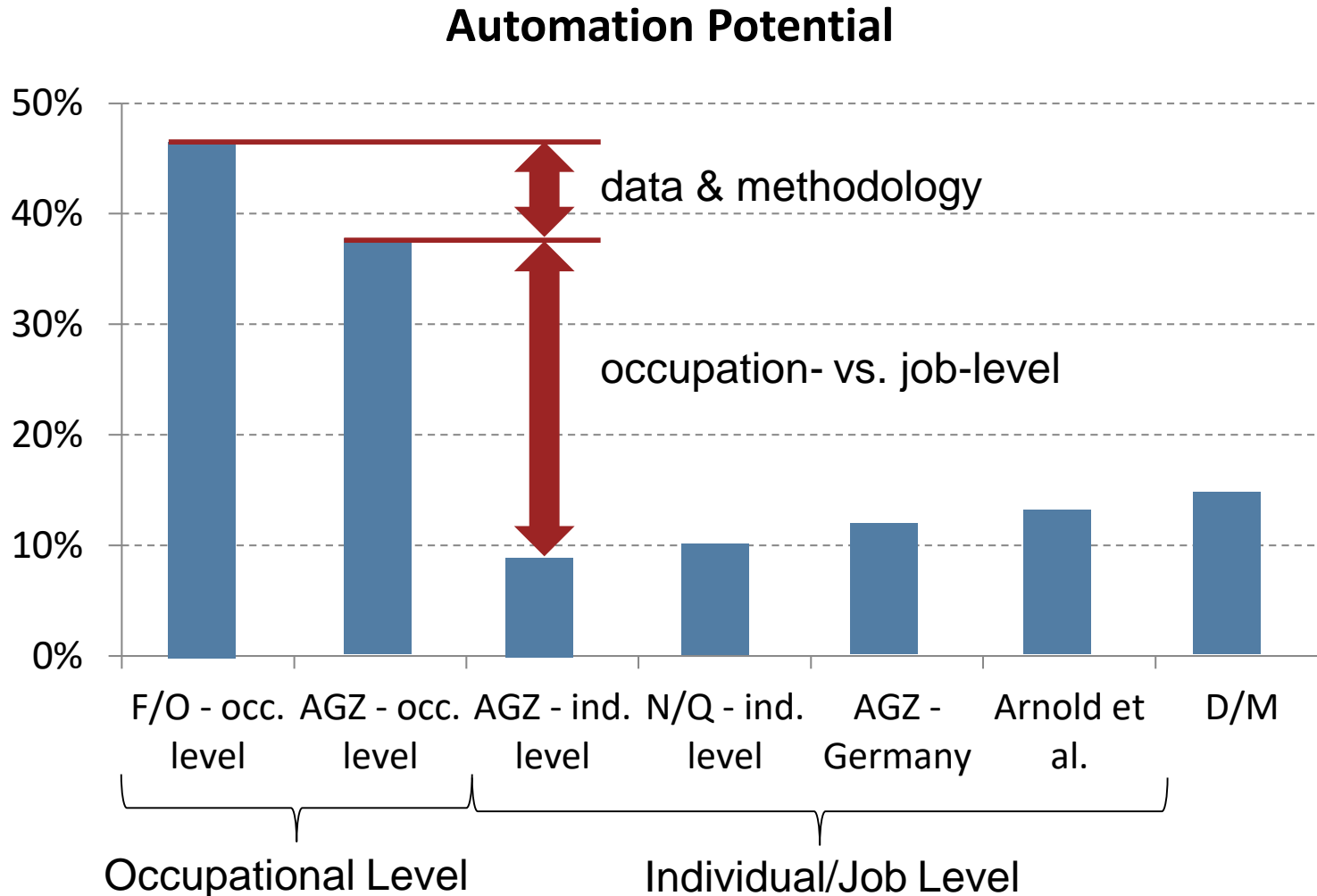
1. How many jobs are automatable?

- Arntz/Gregory/Zierahn (2017): Revisiting the Risk of Automation, Economics Letters 159: 157-160.

2. What are the employment effects of digitization and automation?

- Arntz/Gregory/Zierahn (2018), ongoing research project “Digitalization and the Future of Work”, <http://www.zew.de/PJ1312-1>

Automation Potentials: Large Differences



Automation Potentials vs. Employment Effects

- **Occupation-level approaches overestimate automation potentials**
 - Why? Many workers specialize in non-automatable niches
- **Automation potential \neq employment effects!!!**
 - Slow diffusion of technologies
 - Flexibility of workers
 - Macroeconomic adjustment mechanisms
- **Necessity to consider economic adjustments!**
 - So far most studies focus on technological feasibility, not economic effects

Employment Effects: Mechanisms & Estimation

Structural Model: Mechanisms

Task Change

- Machines complement/substitute workers

Product Demand

- Relative Prices
- Income Effect
- Capital Production

Wage Adjustment

- Adjusting wages compensate employment responses

Mobility

- Workers move to growing segments

Empirical Estimation



Data

Establishment Survey

- Technology Adoption
- Production, Costs

Social Security Records

- (Un-)Employment
- Wages
- Occupational Mobility

Socio-Economic Accounts

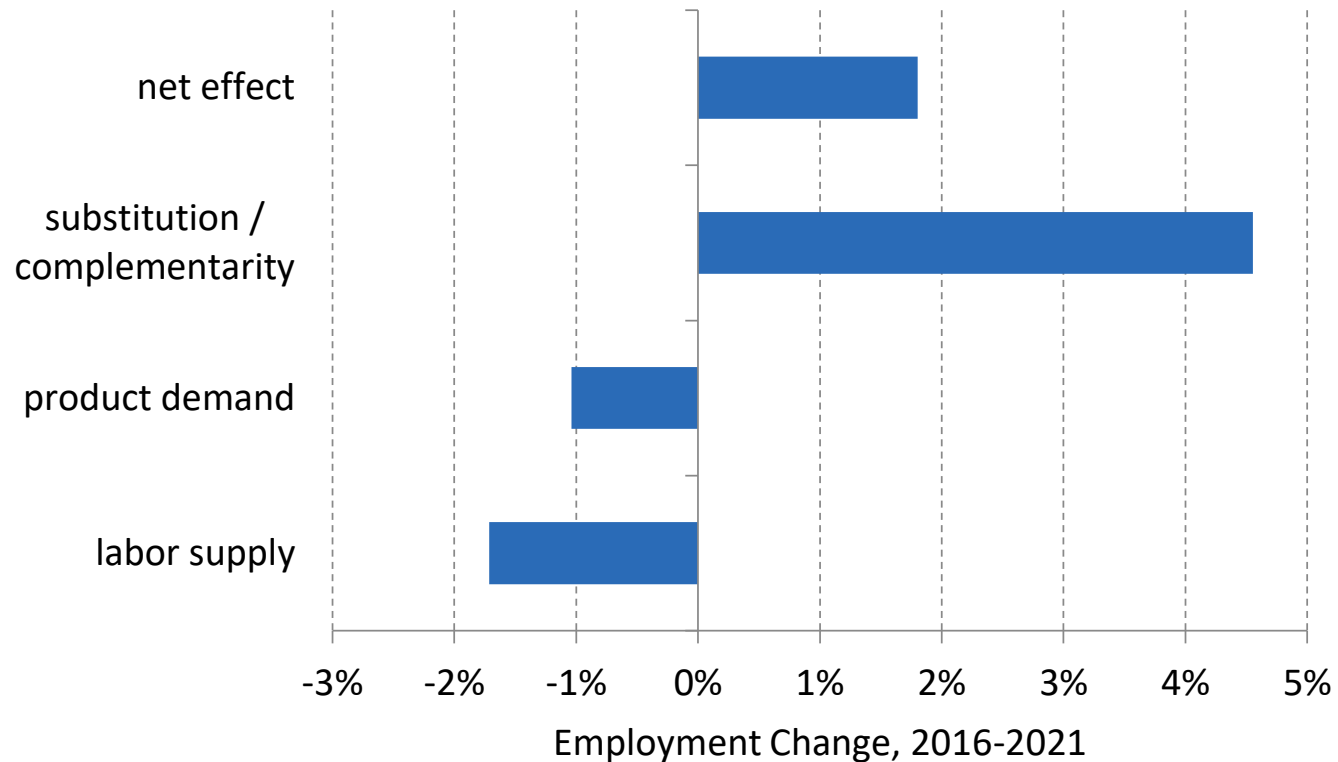
- Production
- Prices, Costs

WIOD

- International Flows
- Sectoral Flows

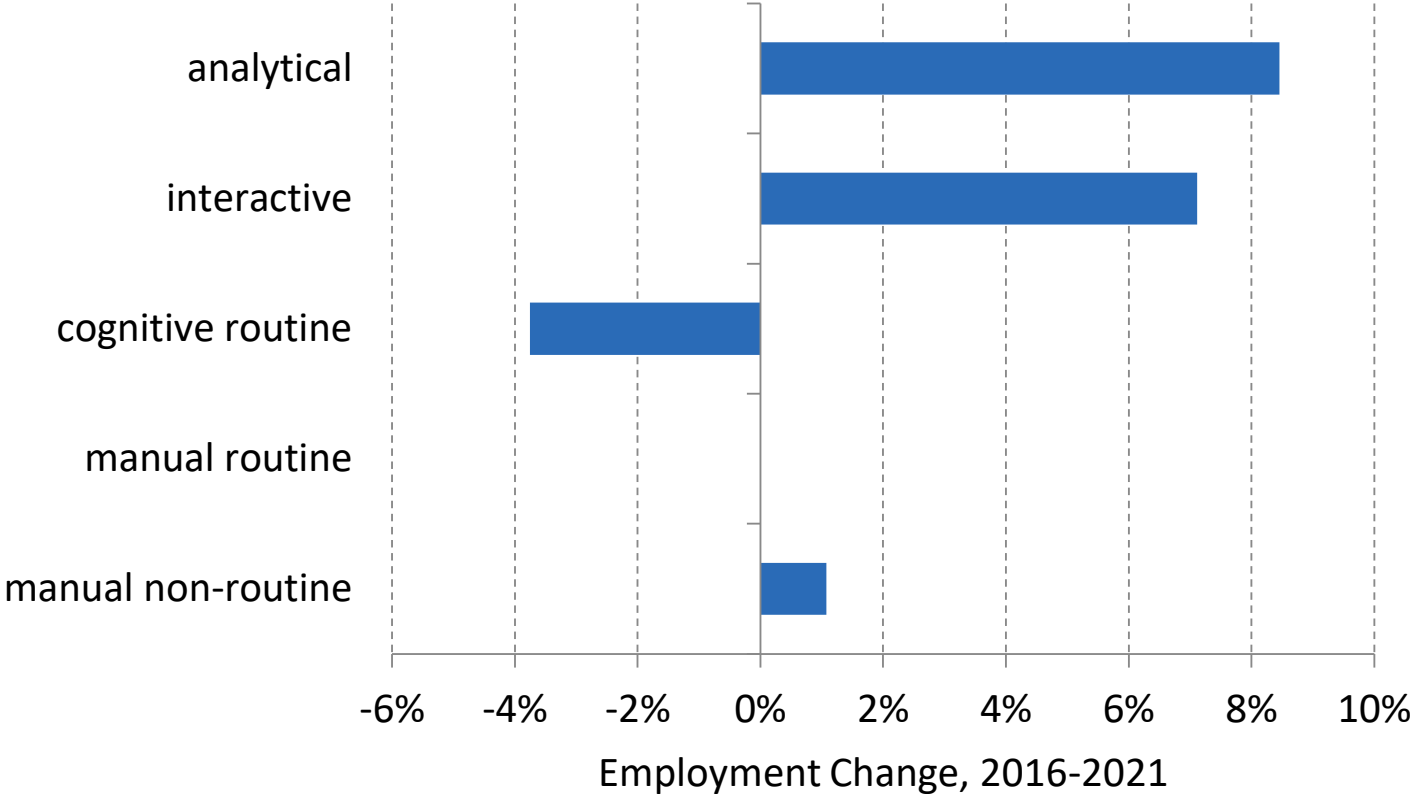
Employment Effects of Digitization

small net positive effects (baseline scenario)



Employment Effects of Digitization

structural shifts between occupations



Conclusions

- Occupation-level studies overestimate automation potentials
- Automation potentials \neq employment effects
 - Slow diffusion of technologies
 - Flexibility of workers
 - Macroeconomic adjustment mechanisms
- Small net aggregate employment effects of technological change
- Large restructuring (occupations, industries) due to technological change
- Macroeconomic adjustment mechanisms play an important role

- Key question is not **how many** jobs, but **which** jobs we will have
- Are workers able to fill these jobs?
 - Rising inequality
 - Rising importance of further training

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References

Arntz/Gregory/Zierahn (2017): Revisiting the Risk of Automation, Economics Letters 159: 157-160.

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