

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“?



“The experts are divided in two camps. Some claim that the flood is rising rapidly and destroys 80 percent of jobs in 20 years. The others think that this result will only be achieved later.”

Der Spiegel, 17.4.1979



“According to this report, 47% of all employees in the USA work in occupations that likely can be automated within the next 10 to 20 years.”

Der Spiegel, 3.9.2016

Research Questions

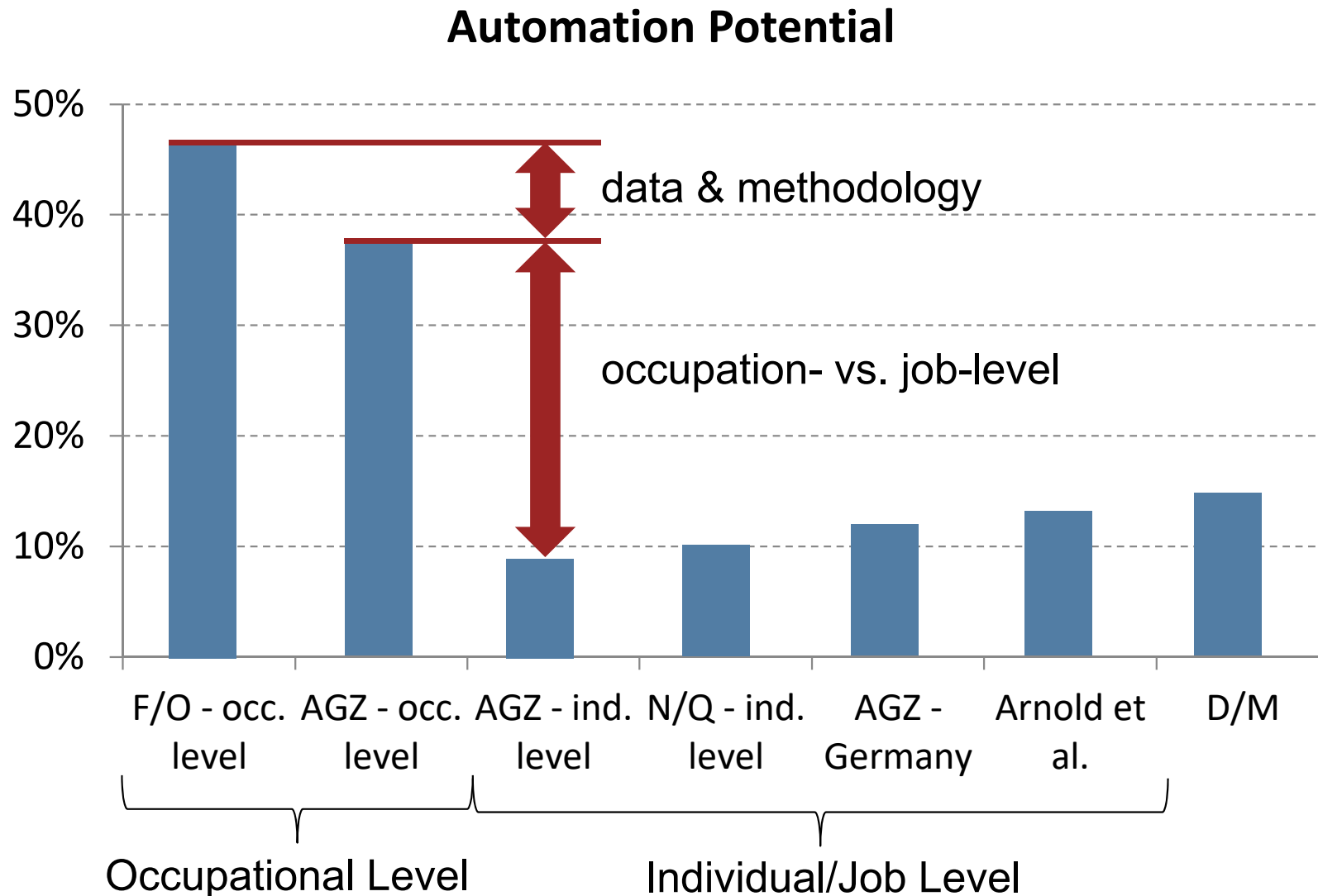
1. How many jobs are automatable?

- 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

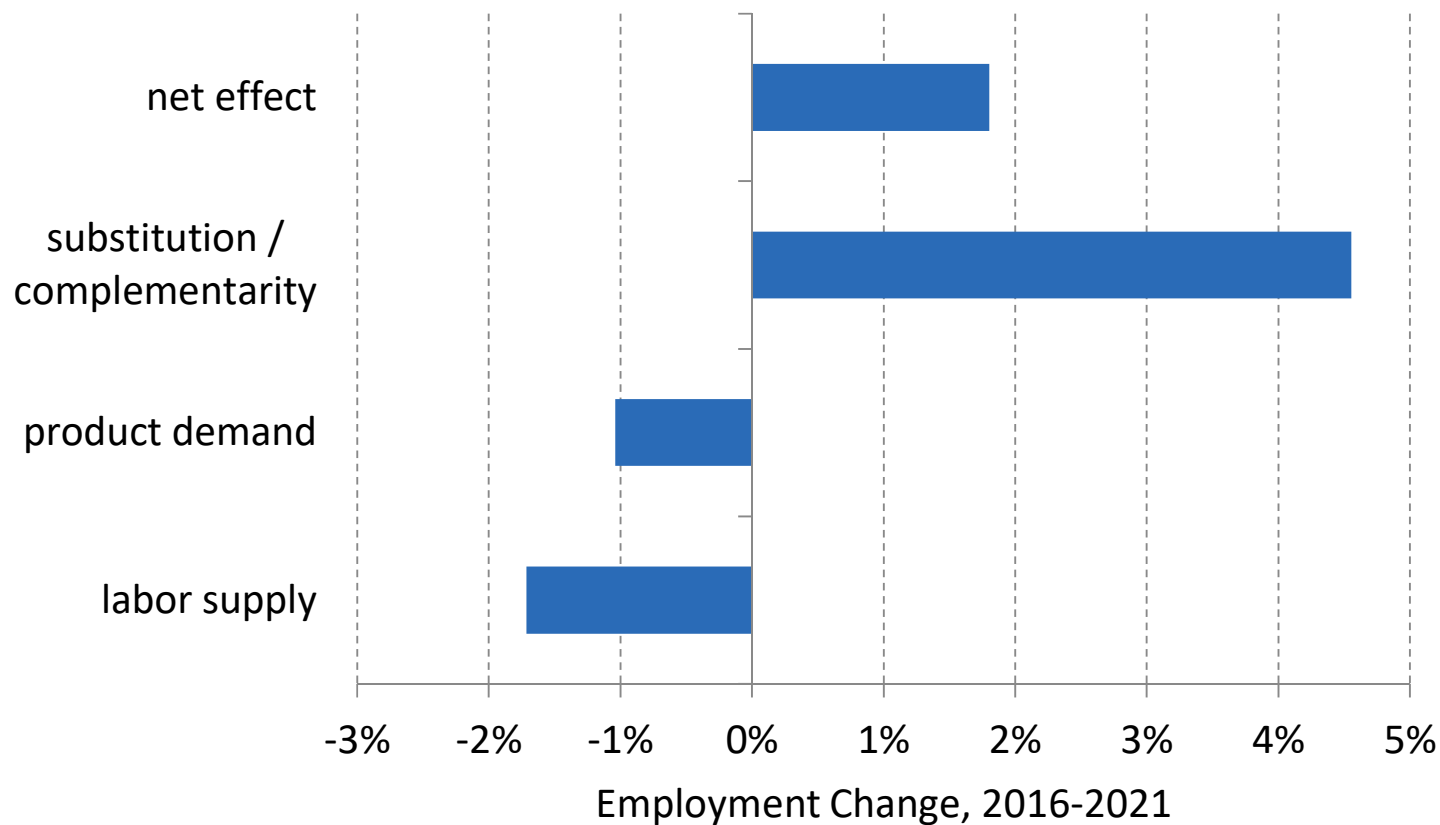
- Production
- Prices, Costs

WIOD

- International Flows
- Sectoral Flows

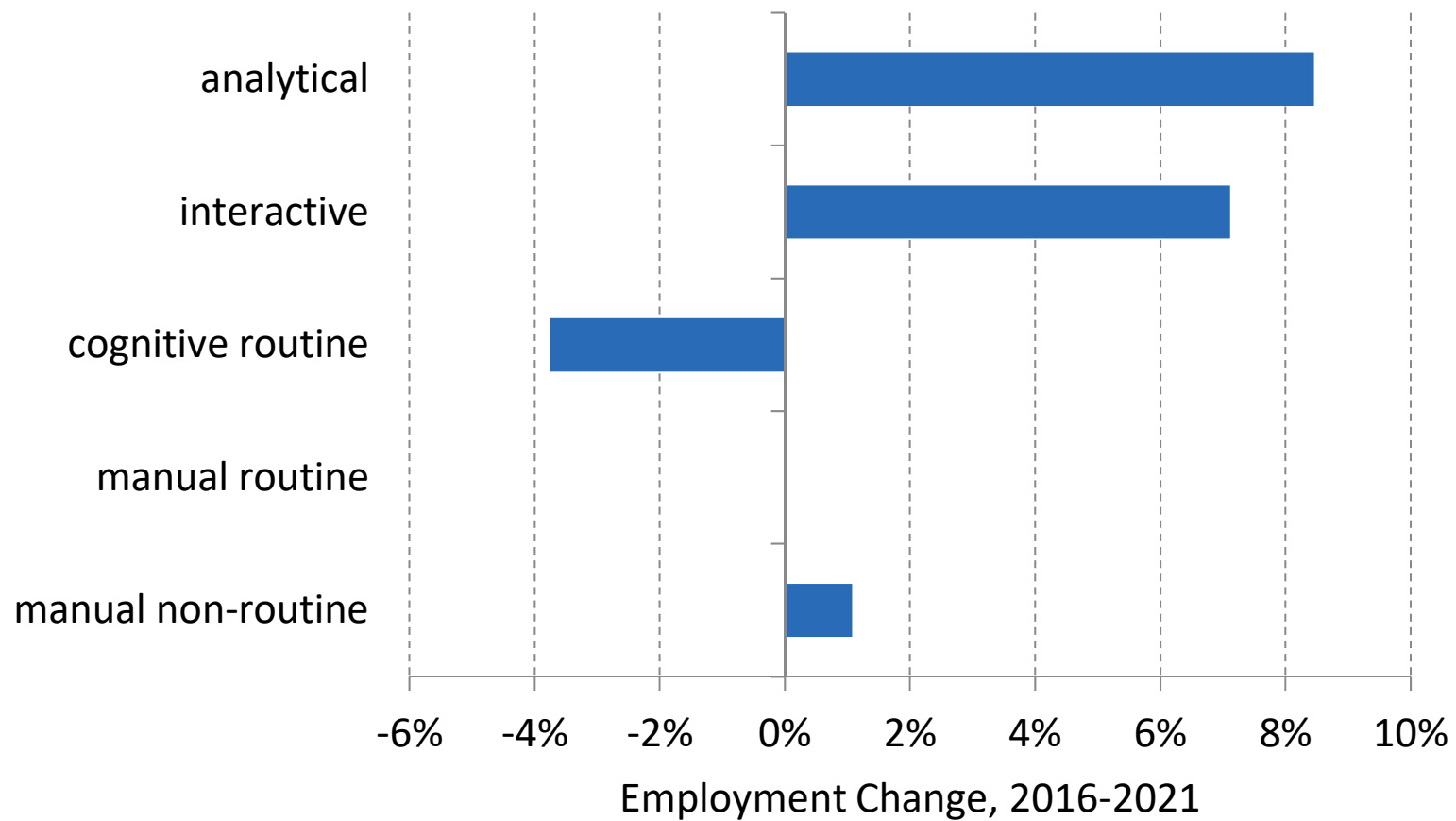
Employment Effects of Digitization

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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