

The drivers of inequality: technology and institution

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- ▶ Products become increasingly digitized causing dramatic improvements in product functionality and performance
- ▶ What are the implications of these product improvements on market dynamics, structural change and inequality?
- ▶ We study...
 - ▶ the process and effect of incorporation of digital components into consumer products.
 - ▶ how incentives to invest in the development of digital components differ between firms in strong/weak economic regions.
 - ▶ which factors determine how different sectors and regions are affected by this aspect of digitization.
 - ▶ how inequality is influenced by the process of digitization.
- ▶ We do this by developing and analyzing a dynamic multi-sector, multi-region (agent-based) industry model.



Model properties and experimental setup

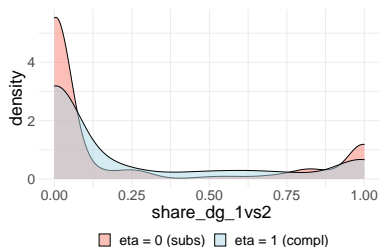
- ▶ Global value chains with digital and conventional intermediates
- ▶ Digital (intangible) goods of heterogeneous quality (based on R&D) → non-rival and excludable (zero marginal production costs)
- ▶ Quality of final product influenced by quality of digital component
- ▶ Two regions, which are (prior to digitization) heterogeneous wrt to final good quality and competitiveness (but symmetric wrt potential to develop digital products)
- ▶ Two digitization scenarios:
 1. No complementarity between conventional and digital components ($\eta = 0$)
 2. Strong complementarity between conventional and digital components ($\eta = 1$)
- ▶ MC simulations based on 500 batch runs over 1250 iterations.

Baseline without Digitization

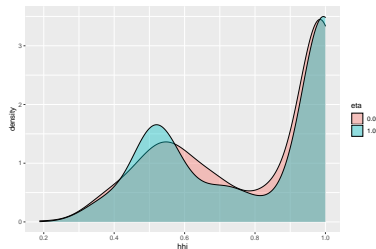
- ▶ Without digitization the economy settles into a stationary state with region 1 economically leading compared to region 2
 - ▶ Regional GDP $GDP_1^* > GDP_2^*$ in the (statistical) steady state.
 - ▶ Sectoral structure with regional specialization on final products (region 1) and conventional products (region 2).
 - ▶ Low level of market concentration.
- ▶ Digitalization starts at $t = 500$:
 - ▶ DG firms start to develop and improve digital components.
 - ▶ FG firms incorporate digital components in the final product in order to improve the quality.



Where does the Digital Goods Sector Develop?

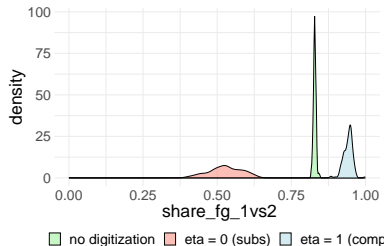
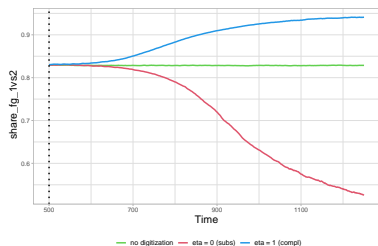


Share of VA in DG Sector in R1



Concentration of DG sector

Effect of Complementarity on Final Goods Sector

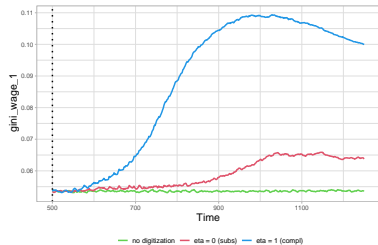


Share of VA in FG in R1:Mean

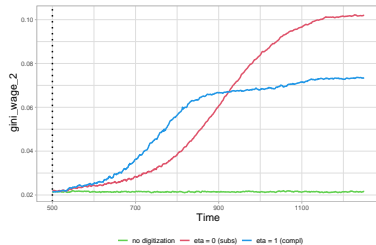
Share of VA in FG in
R1:Distribution

Green: no digitization, red: $\eta = 0$, blue: $\eta = 1$

Implications for Wage Inequality



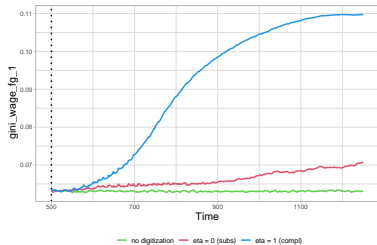
Gini Coeff. Wages R1



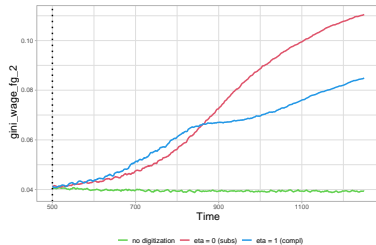
Gini Coeff. Wages R2

Green: no digitization, red: $\eta = 0$, blue: $\eta = 1$

Important Drivers of Wage Inequality: Increasing Heterogeneity of Final Good Firms



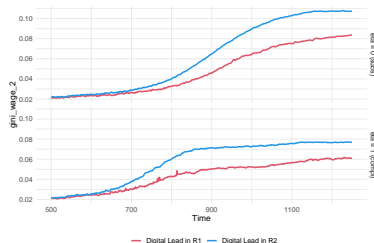
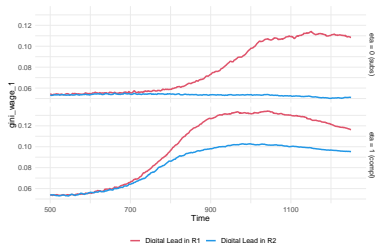
Gini Coeff. Wages FG Sector R1



Gini Coeff. Wages FG Sector R2

Green: no digitization, red: $\eta = 0$, blue: $\eta = 1$

Important Drivers of Wage Inequality: Location of Digital Good Sector



Gini Coeff. Wages R1

Gini Coeff. Wages R2

Blue: Digital Lead in R1, Red: Digital Lead in R2

Upper panels: $\eta = 0$, Lower panels: $\eta = 1$

Thank you for your attention!

