

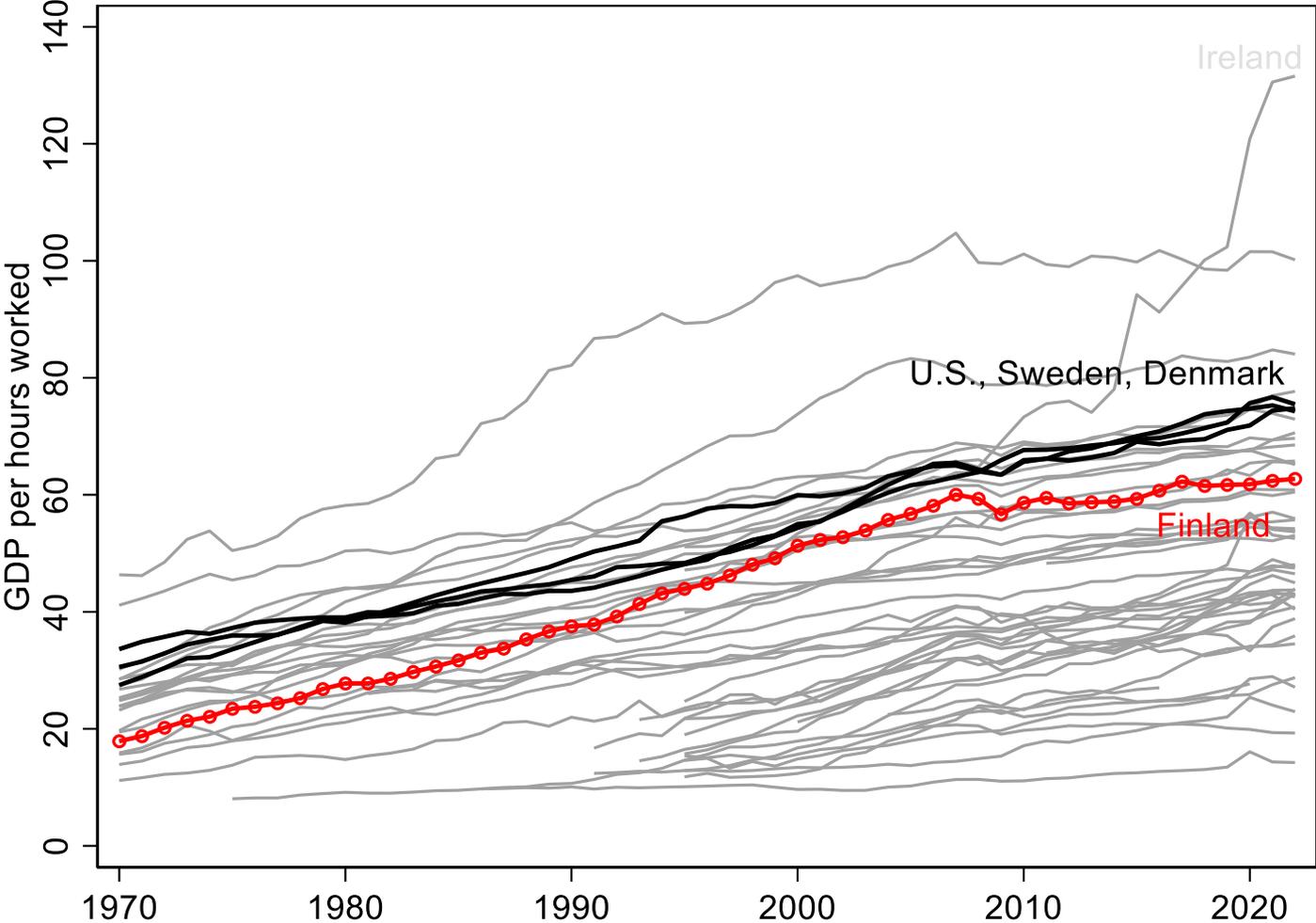
Growth Through Reallocation and Inclusive Innovation in Finland

Elias Einiö

VATT

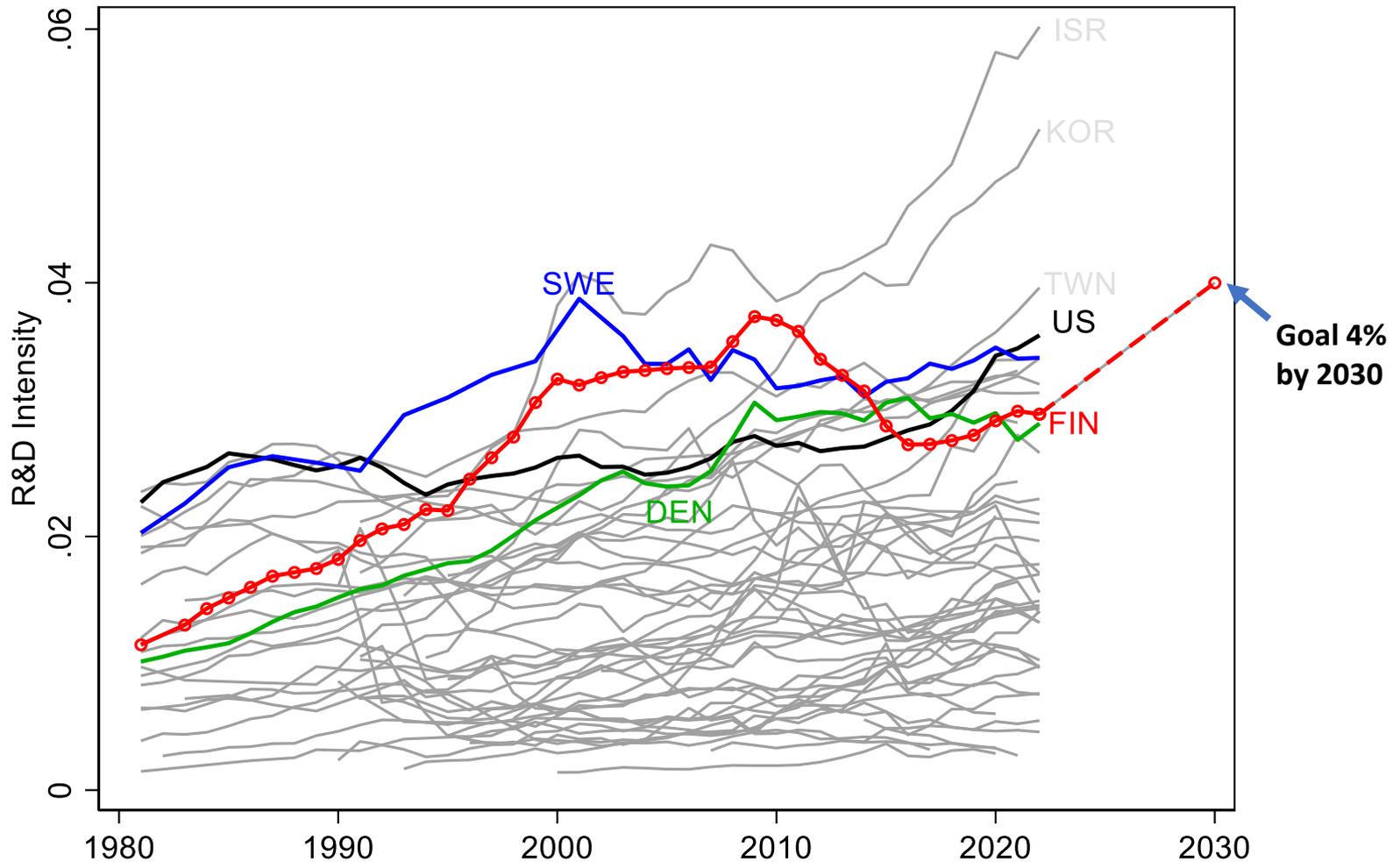
VATT-päivä 2024

Slow productivity growth since 2008



Data source: OECD Productivity database.

R&D Intensity Down by 25%

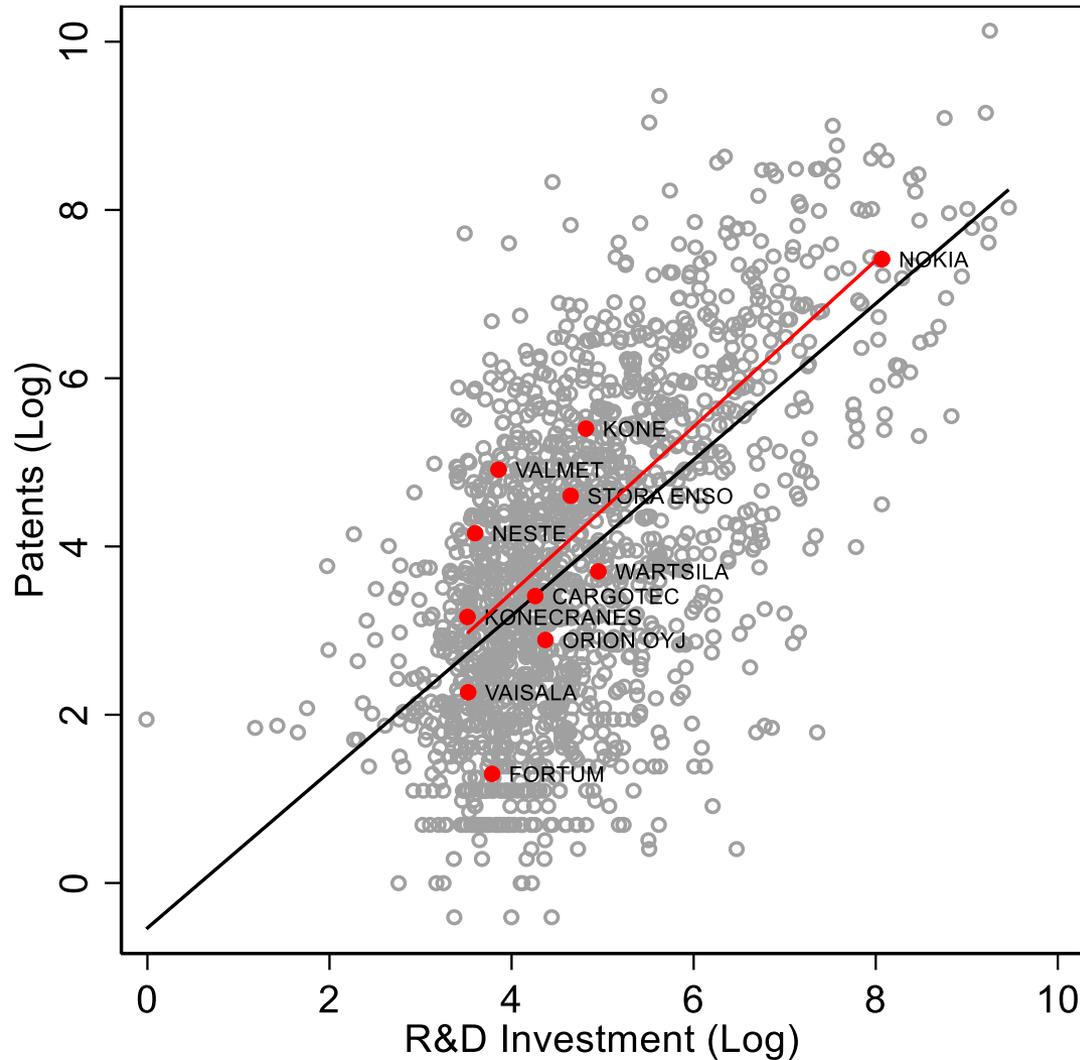


Data source: OECD MSTI Statistics. R&D intensity = Gross R&D spending / GDP.

Innovation Key Driver of Growth

- Better products, services, and processes → More output with same inputs
- Done by people
- Knowledge, skill, and talent essential
- Require research and development efforts (R&D)

R&D and Innovation



Data source: EC-JRC/OECD COR&DIP© database, v.4, 2023. Average annual R&D expenditure in 2017-2019; Average annual patent count in 2018-2020 (patents filed in two or more IP5 offices).

- Dechezleprêtre et al. 2023: Causal estimate 0.5

Is skill and talent in best use?

- Most likely not
- Examples:
 1. Women under-represented in innovation
 - Fraction of female inventors 12% in the US and 8% in Finland
 2. Firms' private incentives lead to too low levels of R&D investment
 - Too little utilization of skilled workforce in innovation

→ Scope for public policies

Outline

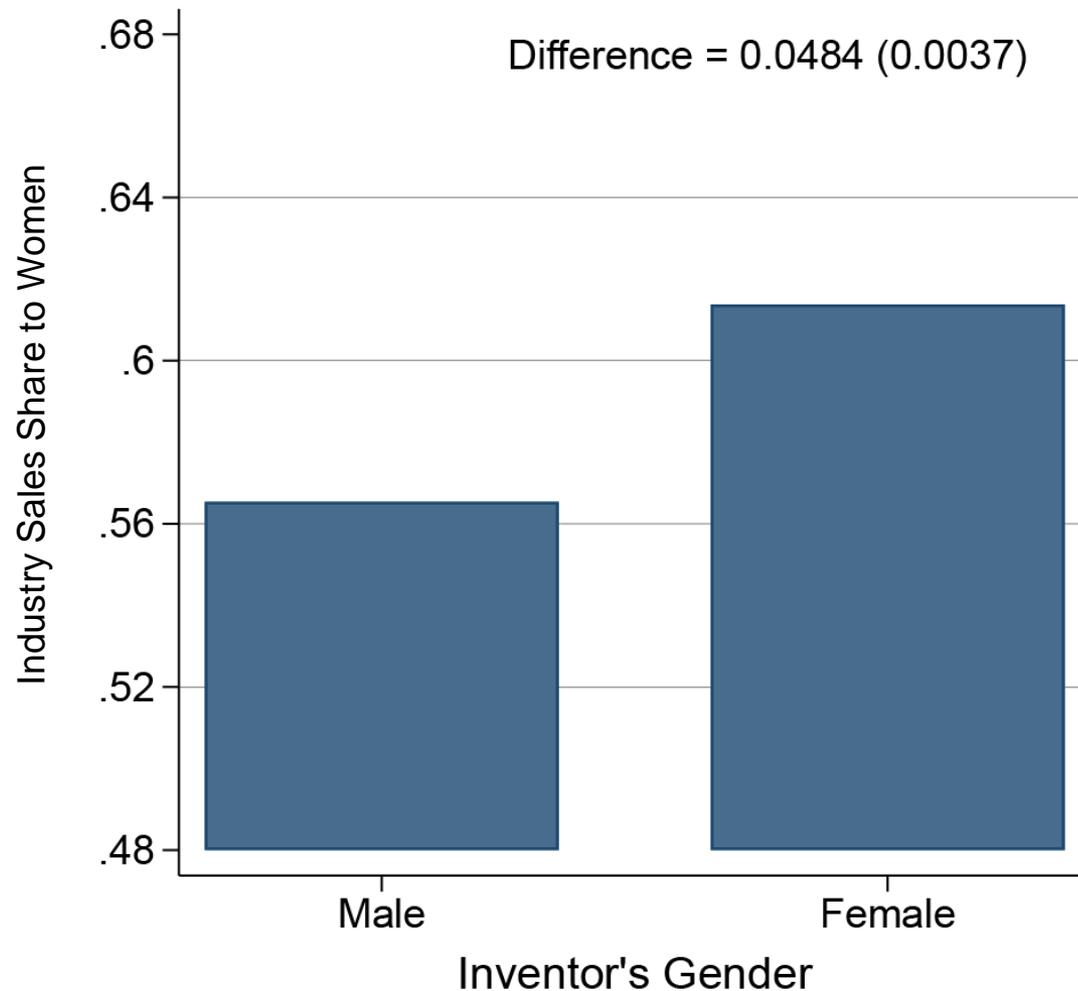
Growth through

- 1. inclusive innovation:** policies that lower barriers for talented individuals in under-represented groups to pursue inventive careers
- 2. reallocation:** policies that steer more skilled labor to more productive R&D work

Growth through inclusive innovation

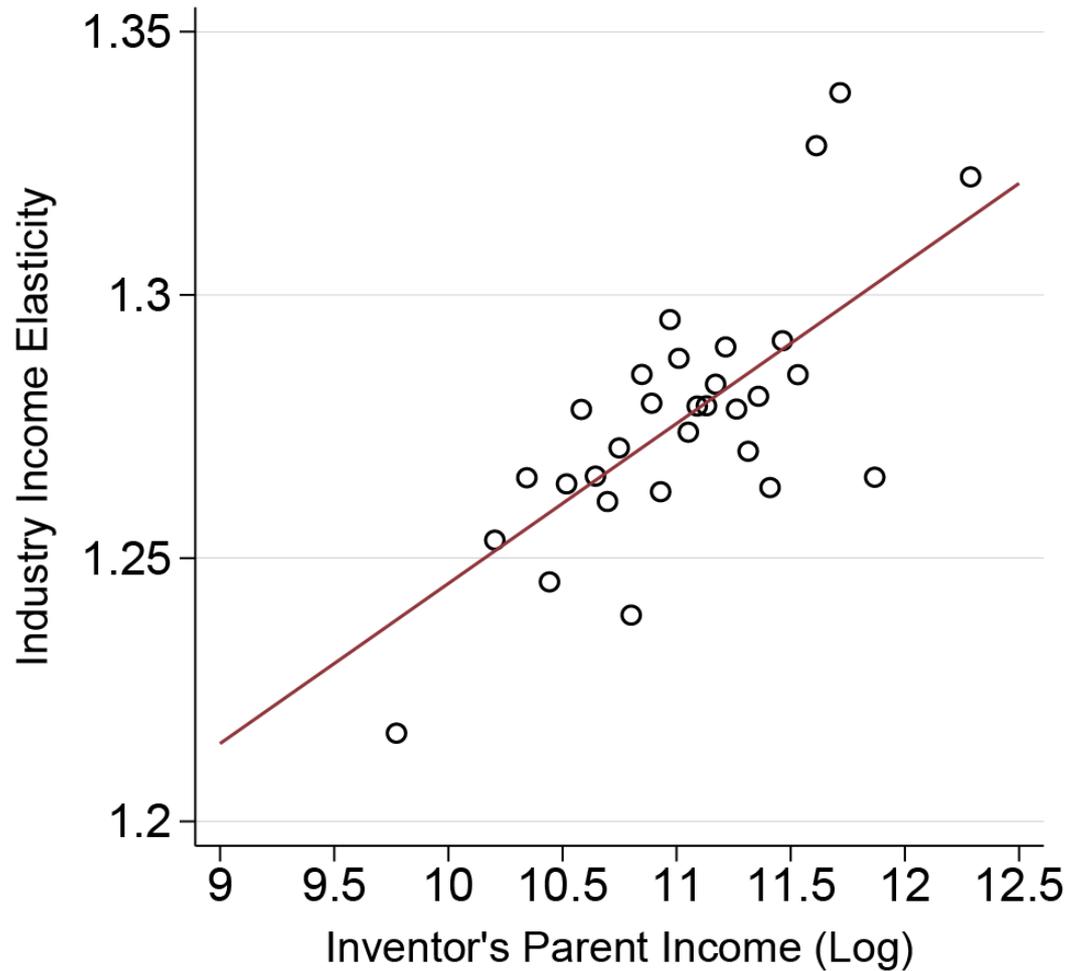
- Elias Einiö, Josh Feng, and Xavier Jaravel 2023: “Social push and the direction of innovation”
- Inventors are primarily men from privileged backgrounds
- How this affects the direction of innovation (to whom inventors invent for)?
- What are the economic implications?

Female innovators more likely to cater to female consumers



Source: Einiö, Feng & Jaravel (2023).

Innovators from more affluent backgrounds cater to richer consumers



Modelling economic implications

- Two groups: women and men
- Women less likely to access innovation careers
- Those who innovate have higher likelihood to innovate for “own” sector (e.g. men for men)

→ Less innovation for women

- (A two-sector general equilibrium model a la Romer. Exposure to innovation careers, sectoral exposure, and inventor productivity distribution scale estimated by fitting model to data)

Key findings

- Under-representation of women among innovators leads to missing product variety for women
- Induces a gender cost-of-living gap almost as large as the gender pay gap (around 20%).
- **Real consumption of men is around 43% larger compared to women**
- Effects of inclusive innovation policies
 - Equalize access to innovation → 50% of inventors women
 - The lost “Marie Curies” enter inventive careers and replace less productive male inventors
 - Growth increases by more than 1 percentage points.
 - Cost-of-living gap drops to 0.5%

Growth through reallocation

- Elias Einiö, William Kerr, Heli Koski, Tero Kuusi, Markku Lehmus, and Tuomas Takalo. "Innovation and Reallocation in an Open Economy"
(on-going work, paper coming soon)
- A well-designed innovation policy has the potential to spur economic growth
- Much of prior work considers large closed economies
 - Insights may not extend to small open economies
 - Shifts in terms of trade and immigration are relatively stronger in small open economies

Modelling innovation and reallocation in an open economy

- Construct a small open economy version of the growth model in Acemoglu, Akcigit et al. (2018)
 - Foreign sector (exogenous, unaffected by Finland)
 - Foreign innovation and knowledge spillovers
 - Foreign competition
- Reallocation:
 - Firm entry and exit
 - Mobility of labor across firms and skill-intensive tasks (research vs. operative white-collar tasks)
- Focus on policies that treat firms uniformly based on observable characteristics
- Key parameters estimated by fitting the model to data

Key findings

1. Optimal R&D subsidy rates positive and fairly high
 - Too few skilled workers do R&D in status quo
 - ...and low-productivity firms survive
 - Growth and welfare higher under optimal rates
2. Effectiveness of policy can be improved by
 - reducing costs of reallocation
 - expanding workforce (e.g. skilled immigration)
3. Foreign innovation policies complement and amplify domestic policies; optimal domestic policies similar

Conclusions

- Micro- and macro-level studies together provide strong support for increasing public R&D funding
- Finland has emphasis in targeted R&D subsidies (project-level grants vs. general schemes such as R&D tax credits)
 - At best targeting projects can be optimal, at worst inefficient
 - Is more costly – should provide better results compared to simple policies (that do well)
- Policies bringing more talented individuals from under-represented groups to innovation a complementary and powerful tool for enhancing growth
 - Double dividend: also reduces economic inequality

References

Acemoglu, D., Akcigit, U., Alp, H., Bloom, N. and Kerr, B. (2018). Innovation, Reallocation and Growth. *American Economic Review*, 108(11) 3450-91.

Dechezleprêtre, A., Einiö, E., Martin, R., Nguyen, K. T., & Van Reenen, J. (2023). Do tax incentives increase firm innovation? An RD Design for R&D, Patents, and Spillovers. *American Economic Journal: Economic Policy* 15(4), 486-521.

Einiö, E., Feng J., Jaravel X. (2023). Social Push and the Direction of Innovation. VATT Working Papers 160.