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THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY

Productivity dispersion and growth

The Role of R&D in Fostering Economic Performance: Lessons from Research and Implications for Finland", OECD & MEAE, 12.2016

Mika Maliranta, University of Jyväskylä & ETLA

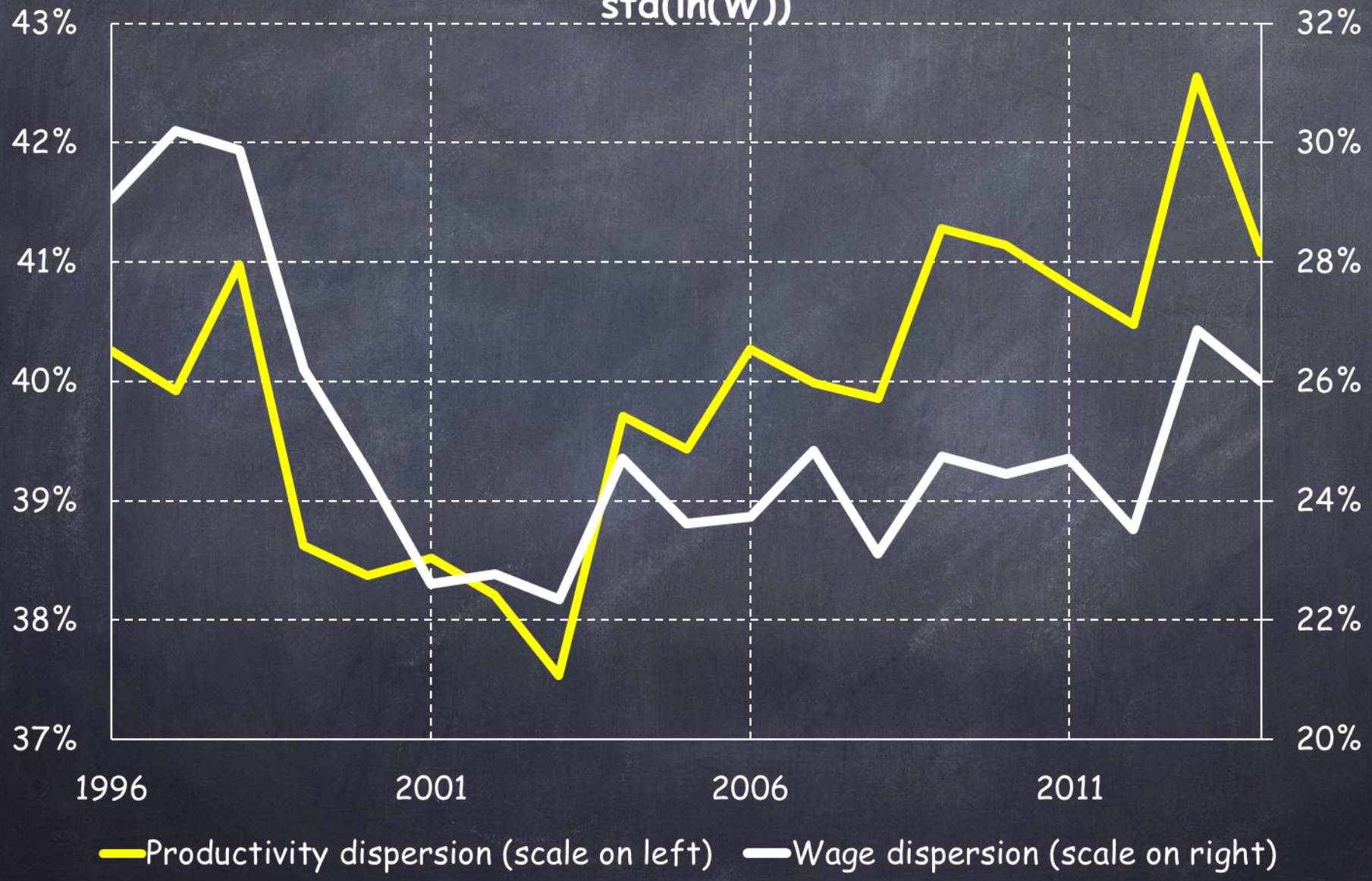
Conclusions

- Productivity dispersion between firms has increased within industries
  - Associated with increase in wage dispersion
- Not because less cleansing through creative destruction (it has increased)
- Slight indication of decrease in ”convergence” between low and high productivity firms (& labor mobility has remained strong in Finland)
- Increased productivity dispersion may reflect technological change and innovation activity

Two perspectives on productivity dispersion

- ”Static”: an indication of inefficiency among firms.
  - Problems of low productivity firm in catching up
  - Increase in dispersion is bad for aggregate productivity
- ”Dynamic”: heterogeneity is a feature of innovation activities and ”creative destruction”
  - Increase in dispersion may be a sign of increased innovation among firms and increased aggregate productivity through ”creative destruction”

Productivity and wage dispersion between firms (within 17 Business sector industries) in Finland, std(ln(LP)) & std(ln(W))

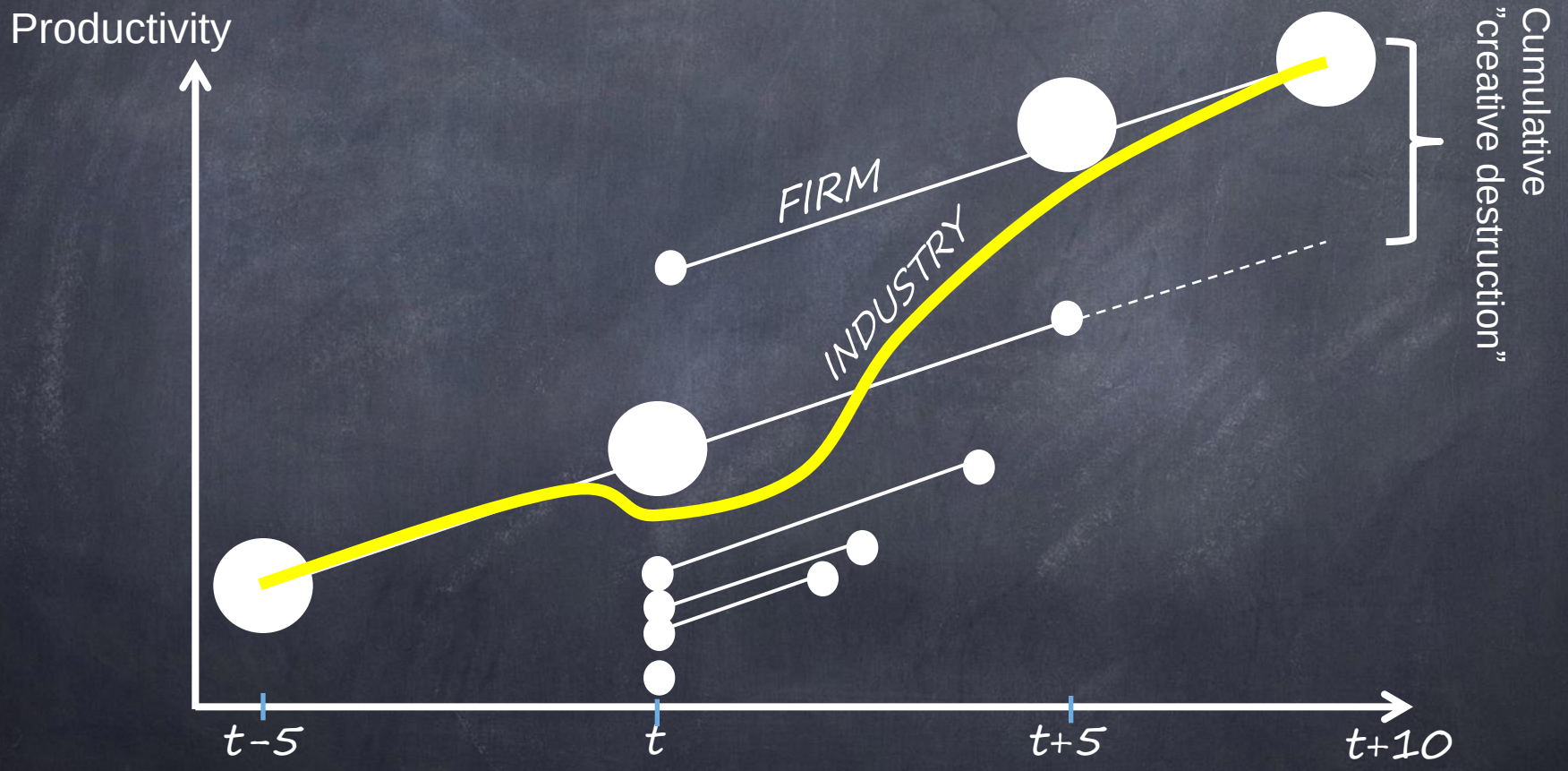


Widening gap between low and high productivity firms

- Less cleansing of low productivity firms through creative destruction?
- Less diffusion of knowledge from high to low productivity firms?
- More heterogeneity through (drastic) innovations?

Productivity growth within firms & Creative Destruction

Productivity growth in industry, within firms & creative destruction



Method: Measurement of productivity growth within firms and between firms

”Non-log-version” of productivity decomposition (e.g. Böckerman-Maliranta 2012)

$$\frac{\Phi_1-\Phi_0}{\bar{\Phi}}=\sum_{i\in\Omega_S}\bar{s}_i^{stayer}\frac{\Delta\varphi_i}{\bar{\varphi}_i}+\sum_{i\in\Omega_S}\bar{s}_i^{stayer}\frac{\Delta\varphi_i}{\bar{\varphi}_i}\left(\frac{\bar{\varphi}_i}{\bar{\Phi}}-1\right)+\sum_{i\in\Omega_S}\frac{\bar{\varphi}_i}{\bar{\Phi}}\cdot\Delta s_i^{stayer}+S_1^{entrant}\frac{\left(\Phi_1^{entrant}-\Phi_1^{stayer}\right)}{\bar{\Phi}}+S_0^{exit}\frac{\left(\Phi_0^{stayer}-\Phi_0^{exit}\right)}{\bar{\Phi}}$$

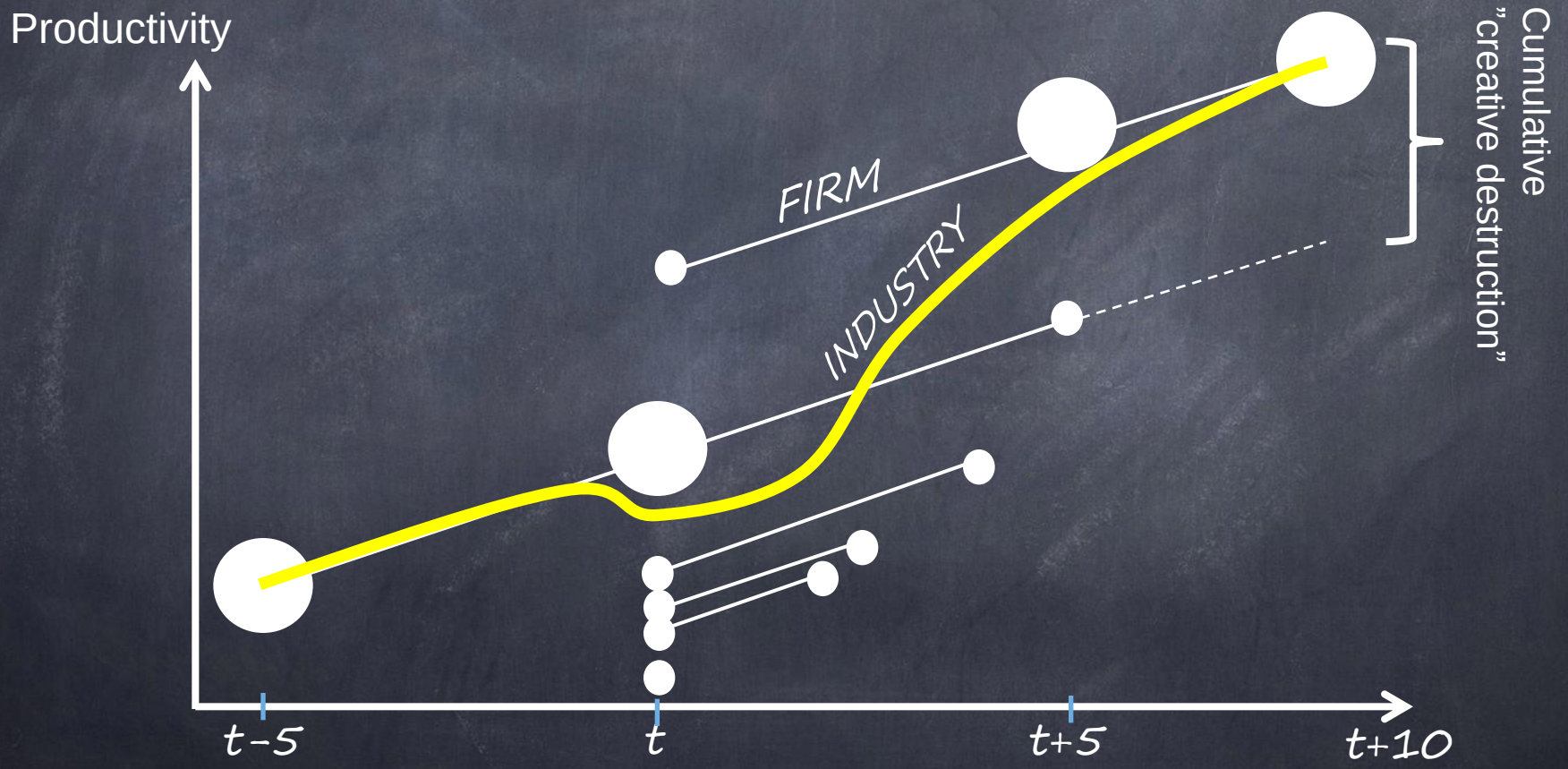
$$\varphi_{i1}=\frac{Y_{i1}}{L_{i1}} \qquad s_{i1}=\frac{L_{i1}}{\sum L_{i1}} \qquad \Phi_1=\sum s_i\frac{Y_{i1}}{L_{i1}}=\frac{\sum_i Y}{\sum_i L}$$

- Note that $\ln\frac{\Phi_1}{\Phi_0}\cong\frac{\Phi_1-\Phi_0}{\bar{\Phi}}$
- See Balk, B. M. (2016). The Dynamics of Productivity Change: A Review of the Bottom-Up Approach. In W. H. Greene, L. Khalaf, C. , R. Sickles, M. Veall, & M.-C. Voia (Eds.), Productivity and Efficiency Analysis (pp. 15-49): Springer.

Empirical analysis

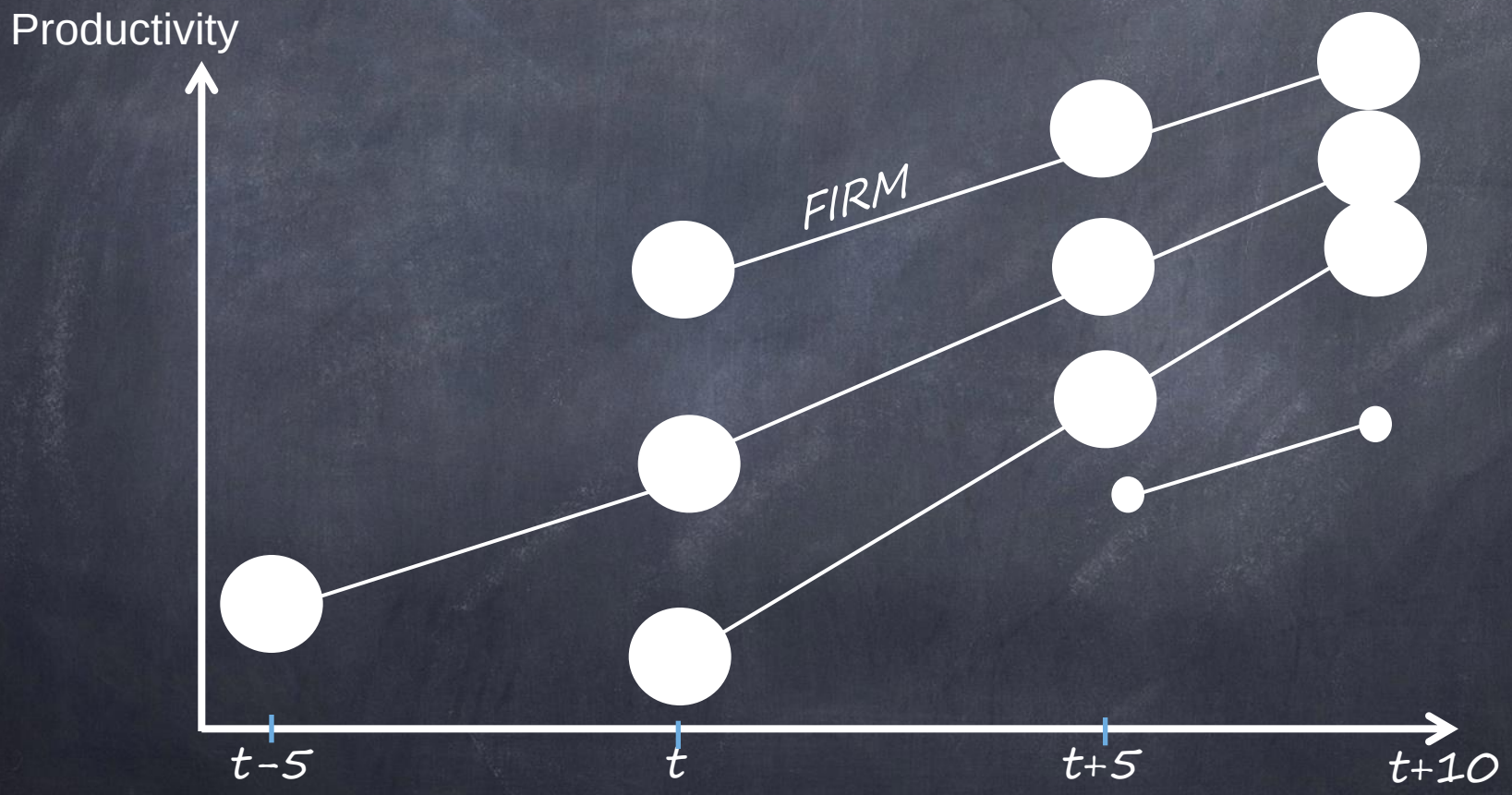
- Based on paper ”Reaalisten yksikkötyökustannusten kehitys ja siihen vaikuttavat tekijät Suomessa ja Ruotsissa”, Maliranta 2016
- Panel data on firms in Finland
- Cover basically all firms (thanks to use of register data)

Productivity growth in industry, within firms & creative destruction



Productivity dispersion and "creative destruction" (within 17 Business sector industries)

Productivity growth and convergence between low and high productivity firms



”Convergence”-component

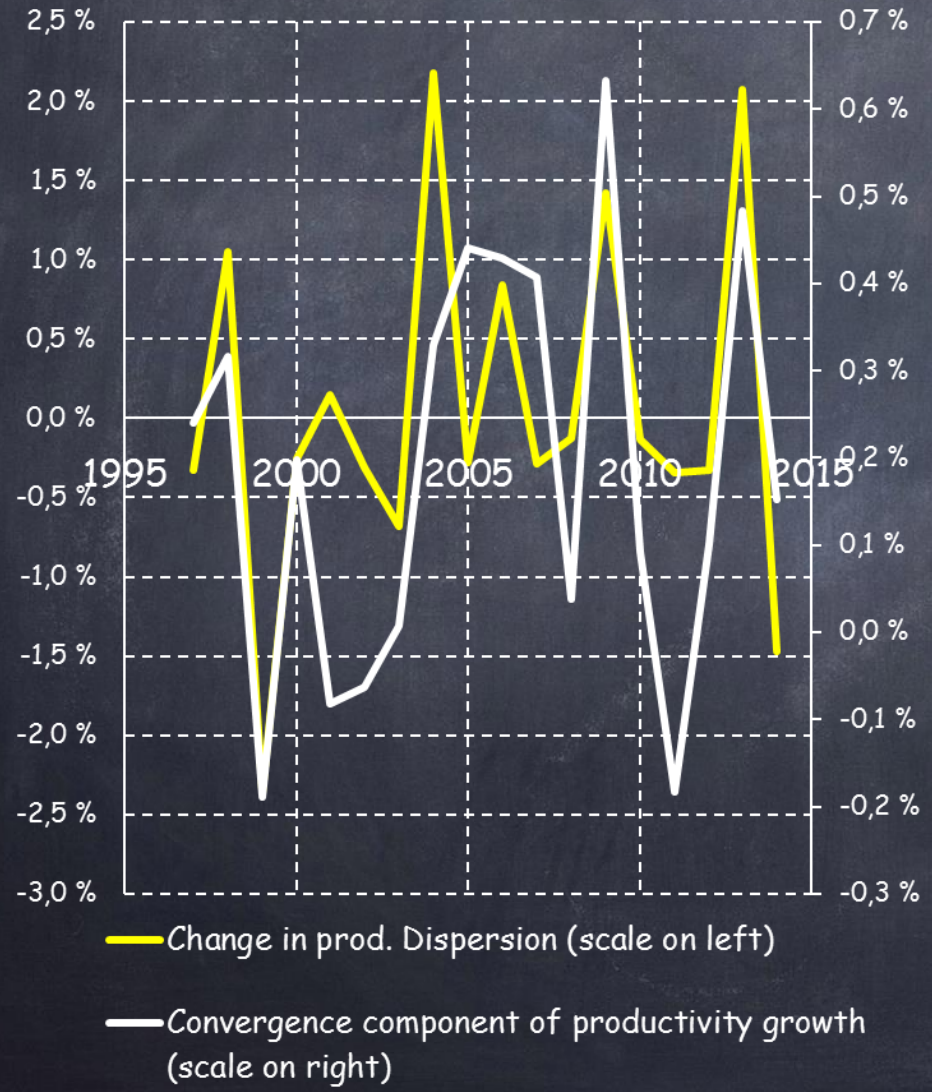
$$\frac{\Phi_1-\Phi_0}{\bar{\Phi}}=\sum_{i\in\Omega_S}\bar{s}_i^{stayer}\frac{\Delta\varphi_i}{\bar{\varphi}_i}+\sum_{i\in\Omega_S}\bar{s}_i^{stayer}\frac{\Delta\varphi_i}{\bar{\varphi}_i}\left(\frac{\bar{\varphi}_i-\bar{\Phi}}{\bar{\Phi}}\right)+\sum_{i\in\Omega_S}\frac{\bar{\varphi}_i}{\bar{\Phi}}\cdot\Delta s_i^{stayer}+S_1^{entrant}\frac{\left(\Phi_1^{entrant}-\Phi_1^{stayer}\right)}{\bar{\Phi}}+S_0^{exit}\frac{\left(\Phi_0^{stayer}-\Phi_0^{exit}\right)}{\bar{\Phi}}$$

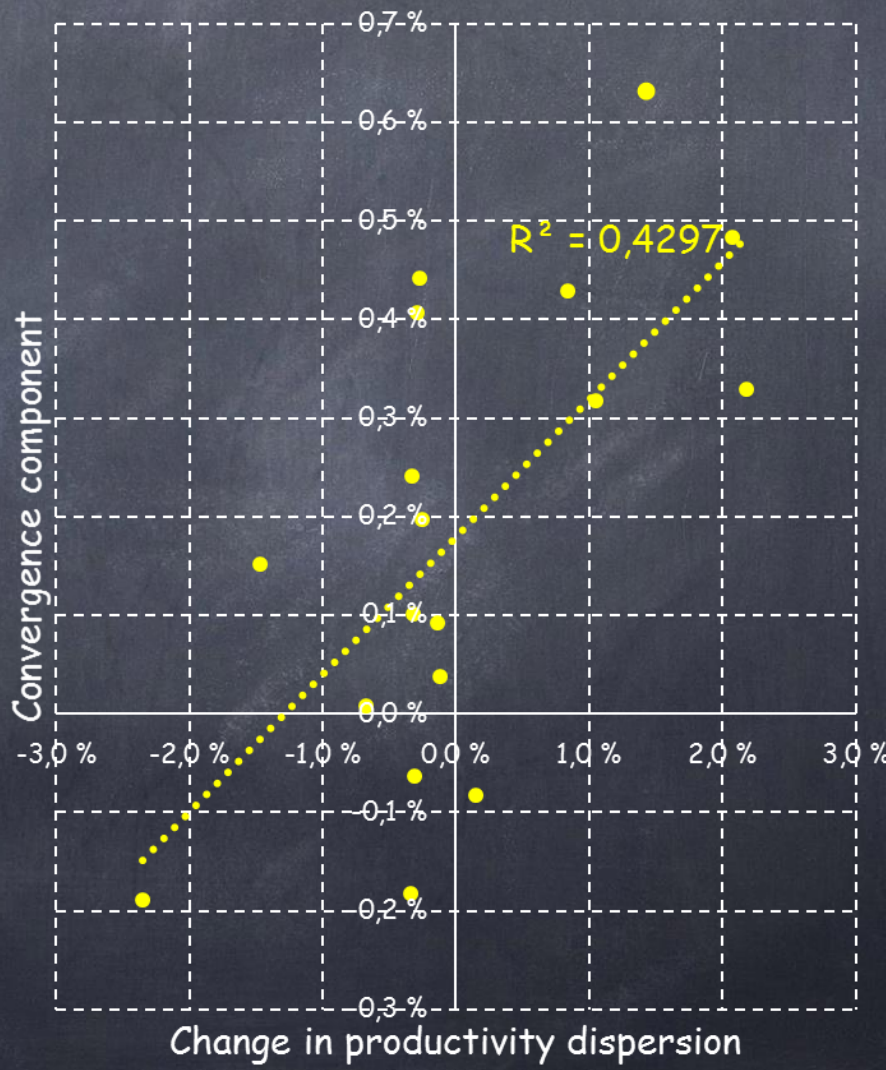
$$\varphi_{i1}=\frac{Y_{i1}}{L_{i1}}$$

$$s_{i1}=\frac{L_{i1}}{\sum L_{i1}}$$

$$\Phi_1=\sum s_i\frac{Y_{i1}}{L_{i1}}=\frac{\sum_i Y}{\sum_i L}$$

Relationship between convegence component and productivity dispersion (within 17 Business Sector industries)





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