

Innovation and Productivity on Industrial Level

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Innovation and labor productivity

- Innovation
- Labor productivity
- GDP

Studies and Research

- Empirical studies
- 50s
- 90s – total sales
- 2000s – value added
- New models, approaches

Goal

- Comparison
- Various industries
same impact?

Method

- Granger causality
- causality as a symmetrical relationship
- difficult to decide about the direction of causality between variable x and variable y
 - how much of the current variable can be explained by the past values and
 - whether lagging the variables by several periods of time improves this explanation.
 - whether variable x could be useful in predicting variable y
- Null hypothesis: x does not Granger cause y and y does not Granger cause x

Model

- Eurostat
- 28 European countries
- 13 main industries
- 16 years: 2000-2016
- **Innovation**
- Investment in R&D as % of GDP
- Investment in R&D as % of industry Value Added
- **Productivity**
- Industrial Value added per person employed

Results - Investment in R&D as % of GDP

Industry	Inv in R&D as % of GDP causes VA p.p.	Value added p.p. causes Inv in R&D as % of GDP
Construction	yes	yes
Electricity, Gas	yes	yes
Financial	yes	yes
Manufacturing	yes	yes
Mining	yes	yes
Scientific Activities	yes	yes
Transportation	yes	yes

Results - Investment in R&D as % of GDP

Industry	Inv in R&D as % of GDP causes VA p.p.	Value added p.p. causes Inv in R&D as % of GDP
Education	no	yes
ICT	no	yes
Water supply	no	yes
Wholesale, Retail	no	yes

Industry	Inv in R&D as % of GDP causes VA p.p.	Value added p.p. causes Inv in R&D as % of GDP
Accommodation	yes	no

Results – R&D/VA p.p.

Industry	R&D/VA causes VA	VA causes R&D/VA
Construction	yes	yes
Electricity, Gas	yes	yes
Financial	yes	yes
Manufacturing	yes	yes
Mining	yes	yes
Scientific Activities	yes	yes
Transportation	yes	yes

Results – R&D/VA p.p.

Industry	R&D/VA causes VA p.p.	VA p.p. causes R&D/VA
Accommodation	yes	no
Agriculture	yes	no

Industry	R&D/VA causes VA p.p.	VA p.p. causes R&D/VA
Water supply	no	yes
Wholesale, retail	no	yes

Industry	R&D/VA causes VA p.p.	VA p.p. causes R&D/VA
ICT	no	no

Summary

- European model – 7 out of 13 industries bidirectional

Discussion

- International comparability of data
- Regulation and policies for taxation of innovation, tax credits
- Better reporting
- More detailed data – individual companies

Resources

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