Impact of the regulatory framework on investment across Europe – an update

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Background

❏ **LE/PwC study for DG InfSo**

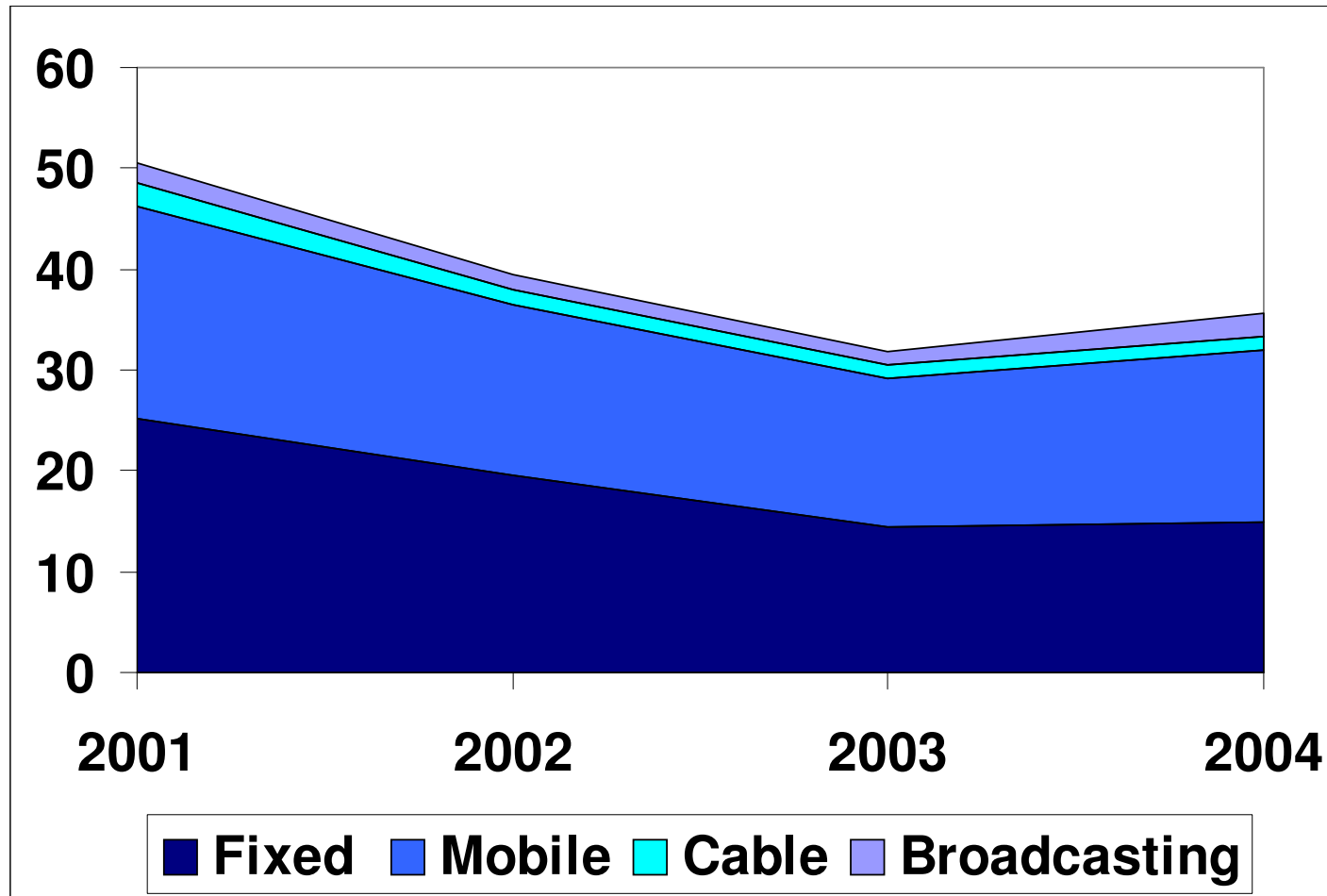 ● published in August 2006

❏ **Main outputs**
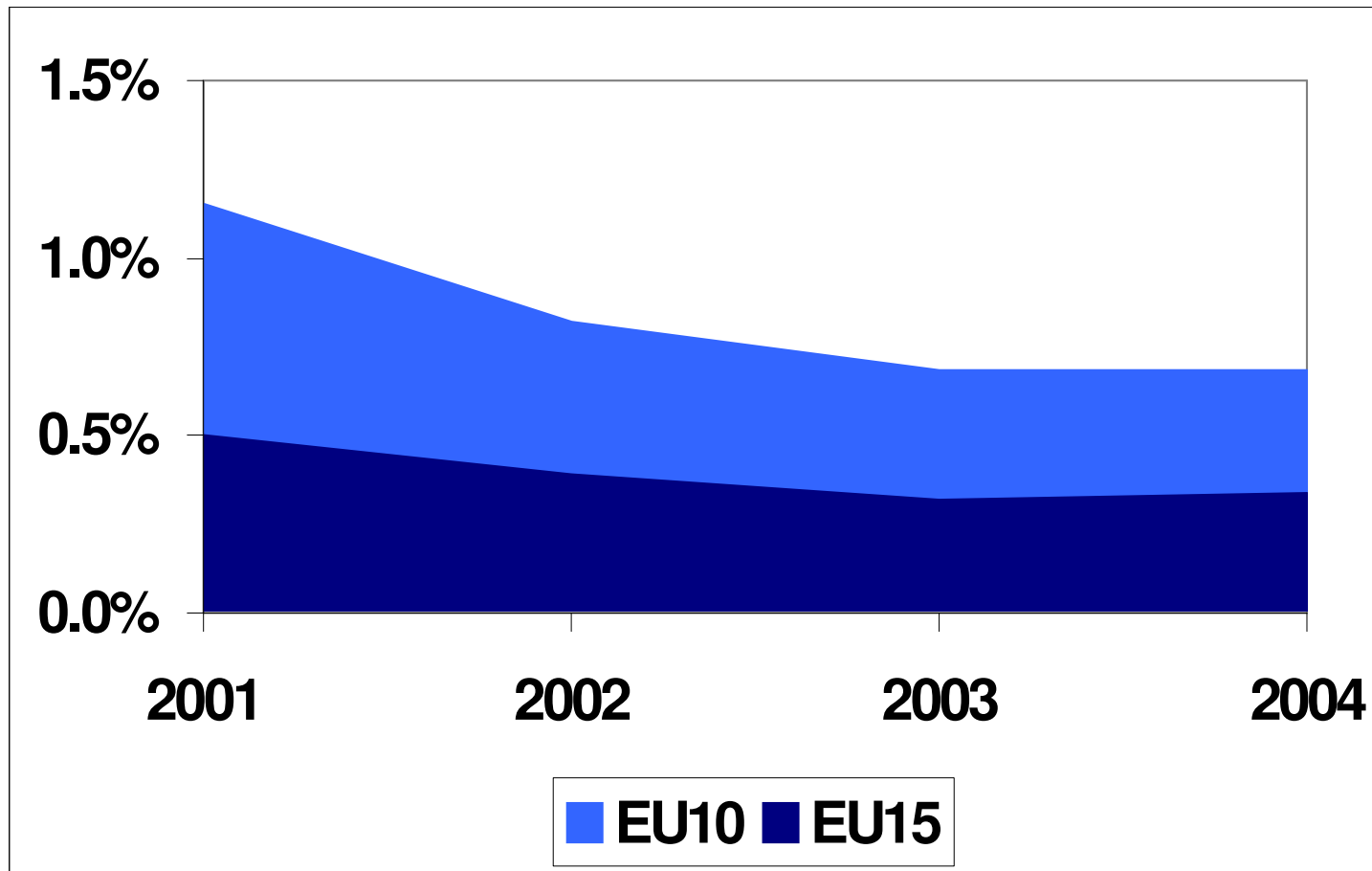
  1. Investment dataset

     ○ By sector

     ○ By country

  2. Assessment of link between regulation and investment
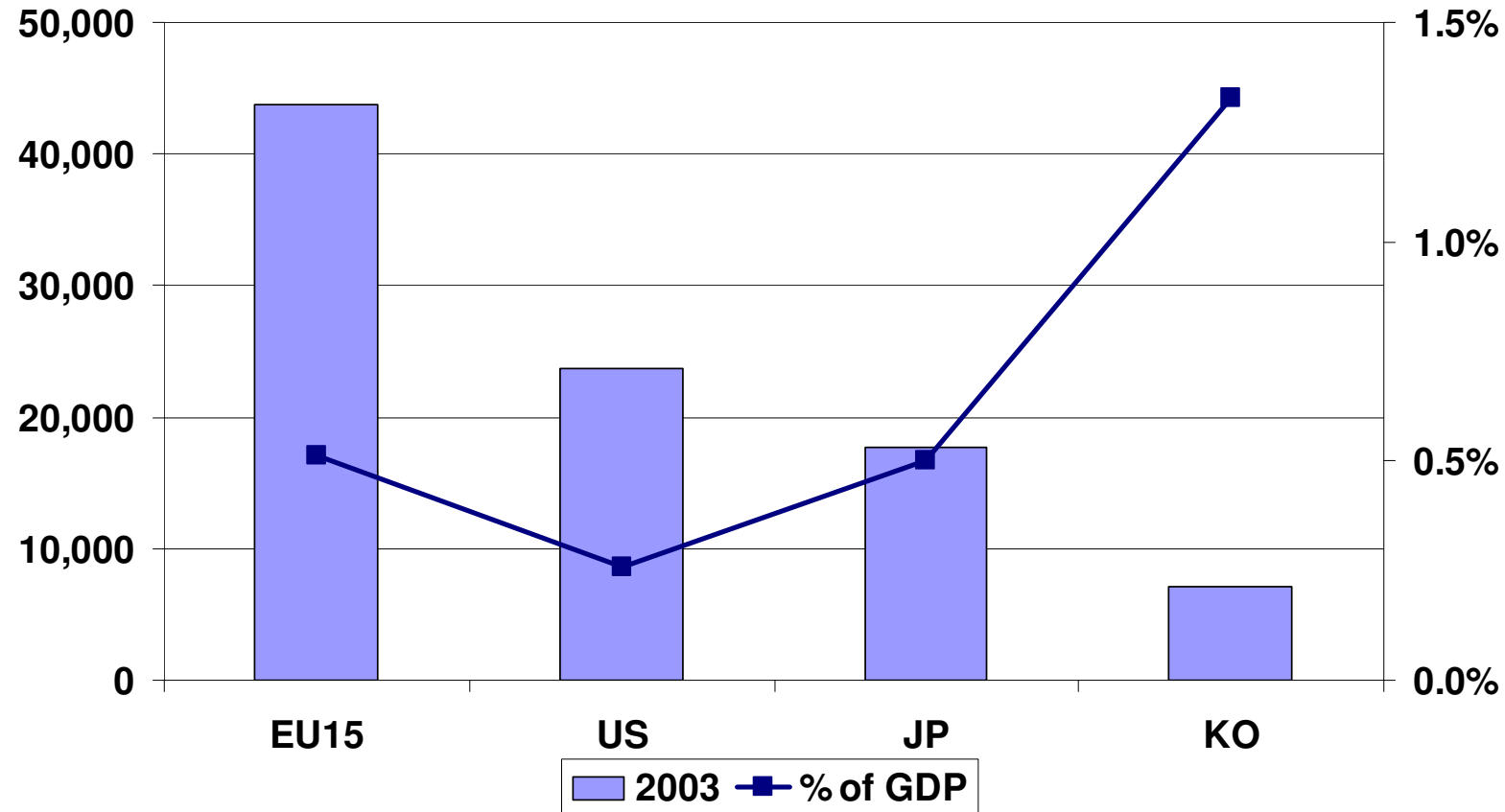
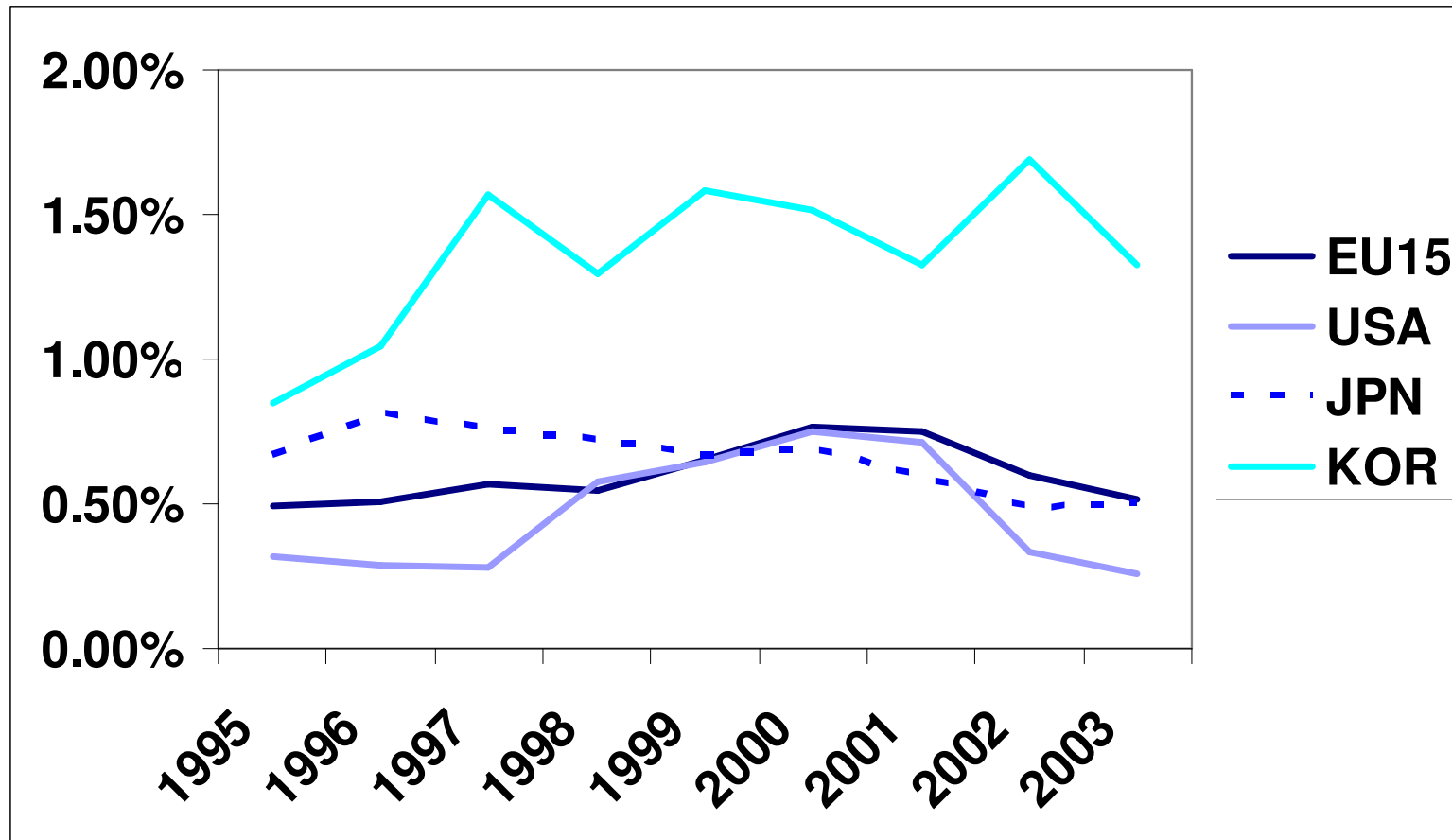# EU investment in e-communications, €bn

Investment in e-communications, %GDP

Telecoms Investment 2003 (€m, %)

Source: ITU

Telecoms Investment % GDP

Source: ITU

Regulation & Investment

❏ **Assessment methods**

- Survey of operators

- More in depth discussions with operators

- Review of documentary material

- Some statistical analysis

❏ **Conclusions**

- Regulation influences investment

- Other factors may be more important

- Regulatory uncertainty is a key issue

Reaction

❏ **DG InfSo press release IP/06/1123**

- "The study thus supports the Commission's assessment that "regulatory holidays" would clearly be counterproductive for individual Member States"

❏ **Following this, our study drew some adverse reaction from German sources:**

- Criticism of EC interpretation re regulatory holidays

- Criticism of substance of report

Criticisms of Substance of Report

1. **Data underestimates investment in Germany**

2. **Conclusion that regulation has an impact on investment is too strong, because**

   a) Sparse data

   b) Low levels of statistical confidence

   c) Causality

LE data limitations

❏ **Not a "census"**

- Data collected for 100 country/sub-sector combinations
- Average 2.3 companies per combination

❏ **Potential for inconsistencies in data definitions**

- Company reports, supplemented by questionnaire
- National accounting practices

❏ **Aggregate data for cross-border and cross-sector operators**

- Use of proxy variables (e.g. total capex, revenues)

Data definitions by source

❏ **International Telecommunications Union (ITU)**
- Definition: Tangibles and intangibles, except spectrum licences
- Source: Questionnaire to regulators and administrations

❏ **OECD**
- Definition: Tangibles and intangibles, except spectrum licences
- Source: National statistical bodies (& regulators or other)

❏ **Eurostat**
- Definition: Physical assets (tangibles) only
- Source: National statistical bodies (pass to regulators or other)

❏ **Bundesnetzagentur (BNetzA)**
- Definition: Physical assets (tangibles) only
- Source: Questionnaire to companies

❏ **London Economics**
- Definition: Physical assets (tangibles) only
- Source: Company reports, questionnaire to companies

ITU/OECD

BnA/E-stat

LE
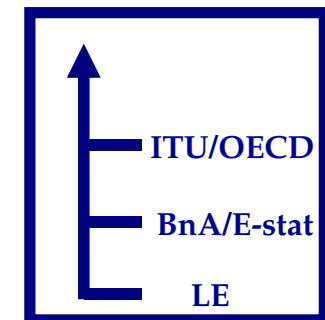
Telecoms Investment in Germany
€bn, current prices
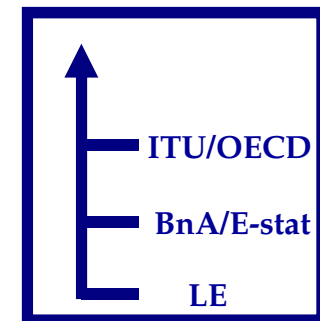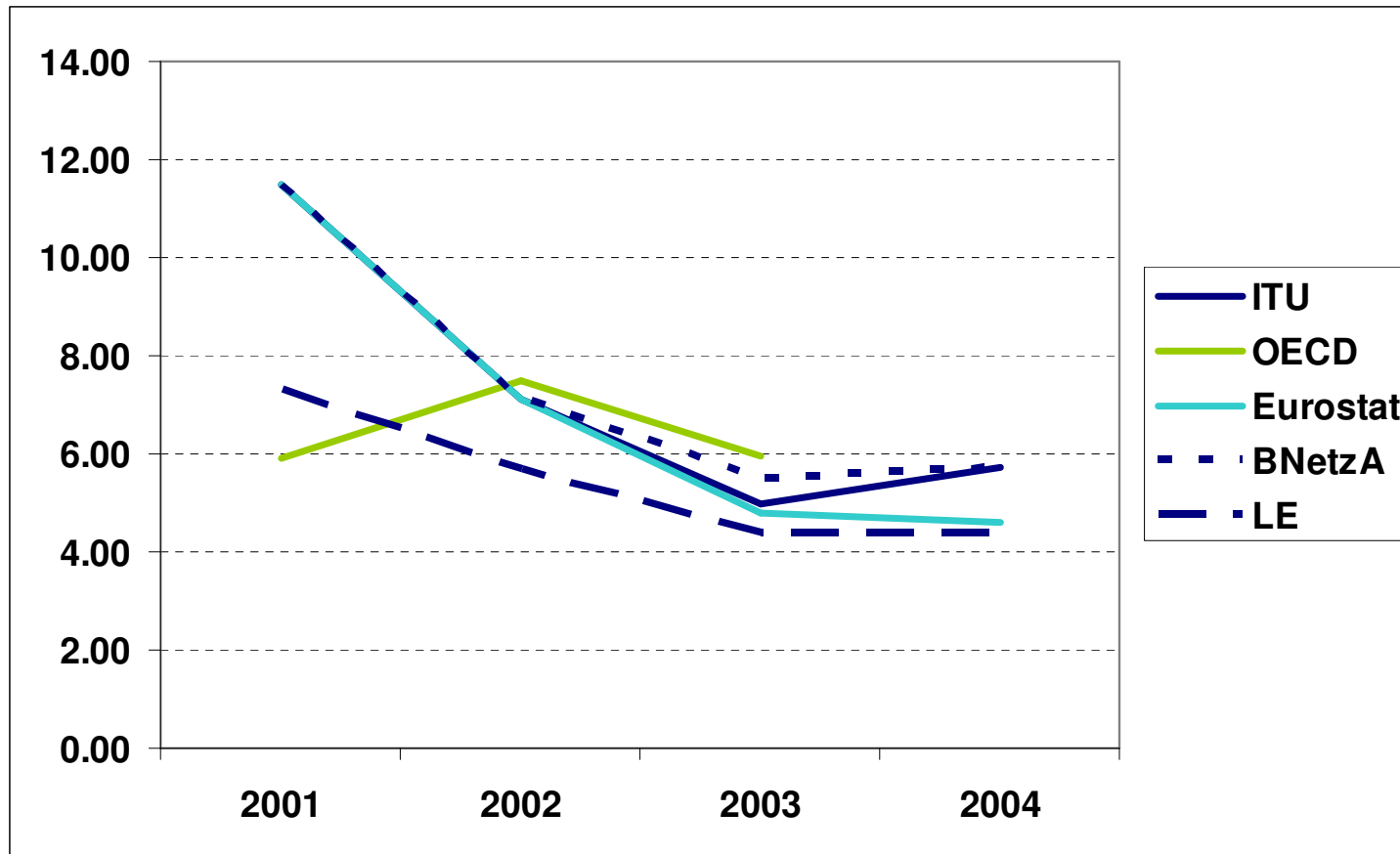
LE model of investment

$$\ln(I_{ijt}) = \alpha + \beta\, Z1_{jt} + \delta\, Z2_{jt} + \theta\, Z3_{ijt} + \varepsilon_{ijt}$$

$\ln(I_{ijt})$ is gross investment in tangible assets for each firm

$Z1_{jt}$ are country-specific characteristics that change over time

$Z2_{jt}$ are market-specific characteristics that change over time

$Z3_{ijt}$ are firm specific characteristics that may or may not change over time

α, β, δ and θ are the model parameters to be estimated and ε is the error term.

The Regulatory Index

❏ **Entry Regulation (1/3):**

➡ legal entry conditions (trunk, int., mobile)
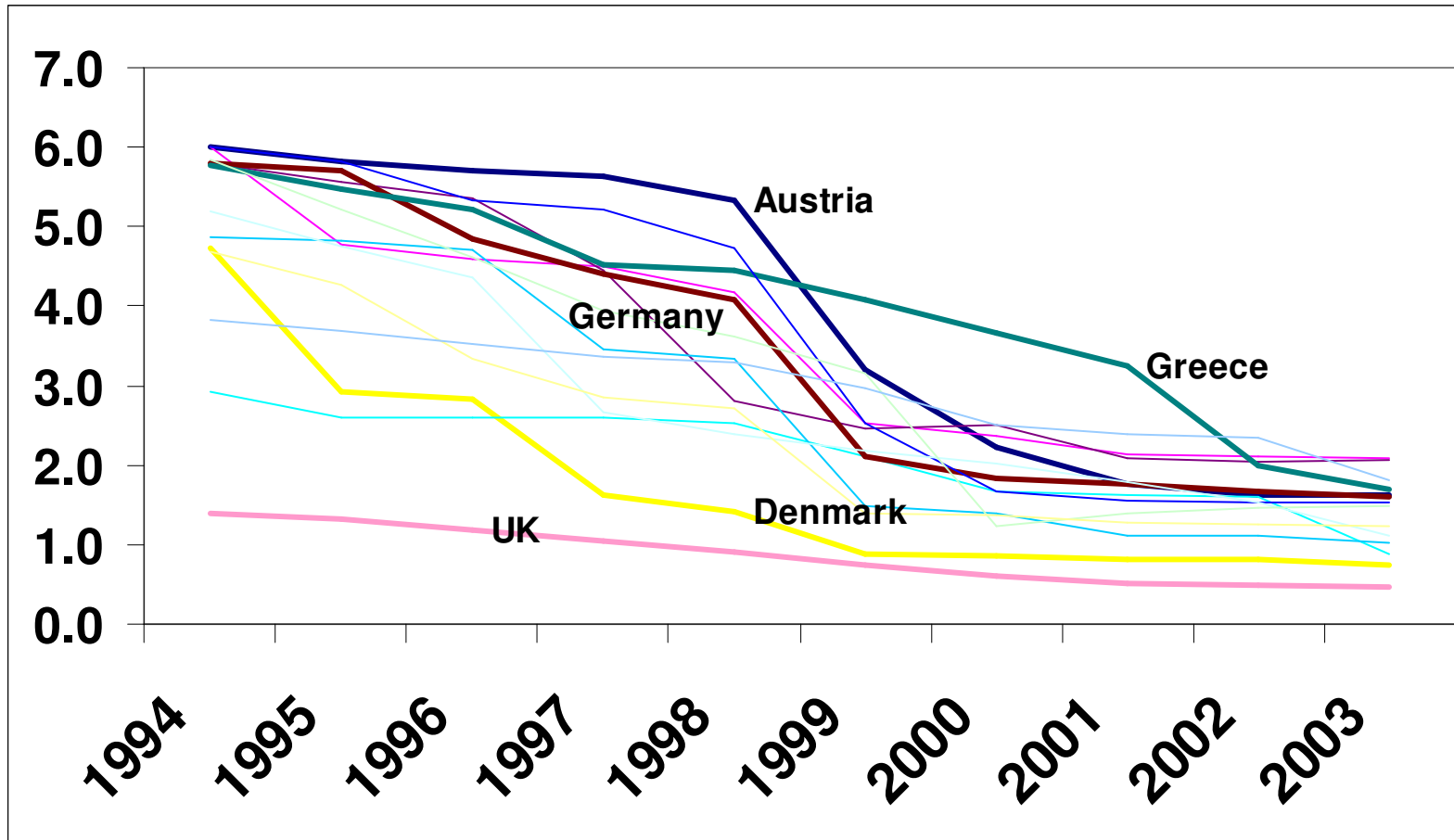
❏ **Public Ownership (1/3):**

➡ % shares government owned (Fixed incumbent/ largest mobile operator)

❏ **Market Structure (1/3):**

➡ Market share new entrants (trunk, int., mobile)

Source: OECD

The Regulatory Index

Source: OECD

Modelling Results

❏ **Results from several versions of the model suggest:**

- Positive relationship between investment and the regulatory index

- i.e. as the index "improves", investment rises

❏ **Other investment drivers**

- "Incumbent"
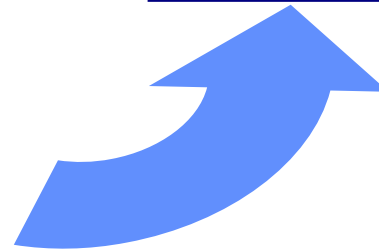
- Multi-country

- multi-sector

- mobile sector

Operator views

❑ **Suggest strongly that regulation influences investment**

   ● +ve and –ve impacts

   ● return on investments

   ● uncertainty

Reducing uncertainty
- Clarity
- Timeliness
- Guidance
- Harmonisation
- Processes

❑ **Regulatory uncertainty consistently raised as key issue**

Causality

❑ **Our statistical analysis alone……**

- ……..does not show causality

- Further investigation is under way

❑ **Other evidence**

- Operators

- Literature (e.g. Alesina et al, 2002)

  ○ Also use OECD regulation index

  ○ Strong effect of regulation on investment across a number of industries (including telecoms)

  ○ Evidence on causality: regulation ➡ investment

Further research

❏ **Causality**

- Regulation ➡ investment

- Investment ➡ regulation

❏ **Instrumental variables approach**

- Replace telecoms regulatory index with an "instrument"

  ○ correlated with telecoms regulatory index

  ○ not correlated with other investment drivers (error term)

❏ **Instrument used**

- OECD rail regulatory index

- Corr. Coefficient – 0.59

Initial results

❑ **Using 2SLS:**

- Estimated
  ltelecom= α + β lrail + ε

- Used predicted values
  (lptelecom) in original
  equation

❑ **Regulatory index
significant at 10%**

❑ **Other specifications
lead to similar results**

❑ **Results**

Variables	Original Model	2SLS
ltelecom	0.332 (1.52)	--
lptelecom	--	0.410 (1.66)*
lgdpc	0.722 (1.93)	0.833 (3.21)**
lland	0.319 (1.93)	0.306 (1.87)
ldensity	0.192 (0.99)	0.135 (0.70)
dmobile	1.237 (4.75)**	1.251 (5.14)**
dinc	0.919 (2.18)*	0.973 (2.32)*
mnat	0.176 (0.41)	0.122 (0.31)
msec	0.753 (2.14)*	0.738 (2.13)*
d2003	-0.234 (-0.94)	-0.116 (-0.46)
lla	0.275 (2.81)**	0.274 (2.80)**
Constant	-6.143 (-3.05)**	-6.454 (-3.45)**
R-squared	0.55	0.57

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