Intellectual Capital for Communities
in the Knowledge Economy

Intellectual Capital for Communities in the Knowledge Economy
Nations, Regions, Cities and Emerging Communities
"The role of intellectual capital in explaining the growth difference between the US and Europe

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Motivation

- Growing disparities in growth across OECD countries (OECD 2003, 2005; KOK-report; Sapir Report)
- Europe is lagging behind the US in GDP per capita and the level of IC
- Aim of the study:
  - revisit the effects of IC on growth of GDP per capita in industrialized countries
  - Scenario: Closing the gap in GDP per capita between the EU and the US when the level of IC in the EU is similar to that of the US?
- Lack of clear definition of intellectual capital but IC and intangibles are closely related (Bounfour 2003)

Previous literature

- Innovation capital is one of the most important determinant of per capita GDP growth and TFP growth (see OECD 2003; Bassanini et al., 2001; Coe and Helpman, 1995; Guellec and Van Pottelsberghe, 2004 and Nadiri, 1993)
- R&D expenditures in the high-tech fields/sectors generate higher return to the economy compared with R&D in other fields/sectors (Griliches and Mairesse, 1984; Nadiri 1993)
- High-tech innovation activities may have a greater potential for economic growth due to larger externalities

Empirical model

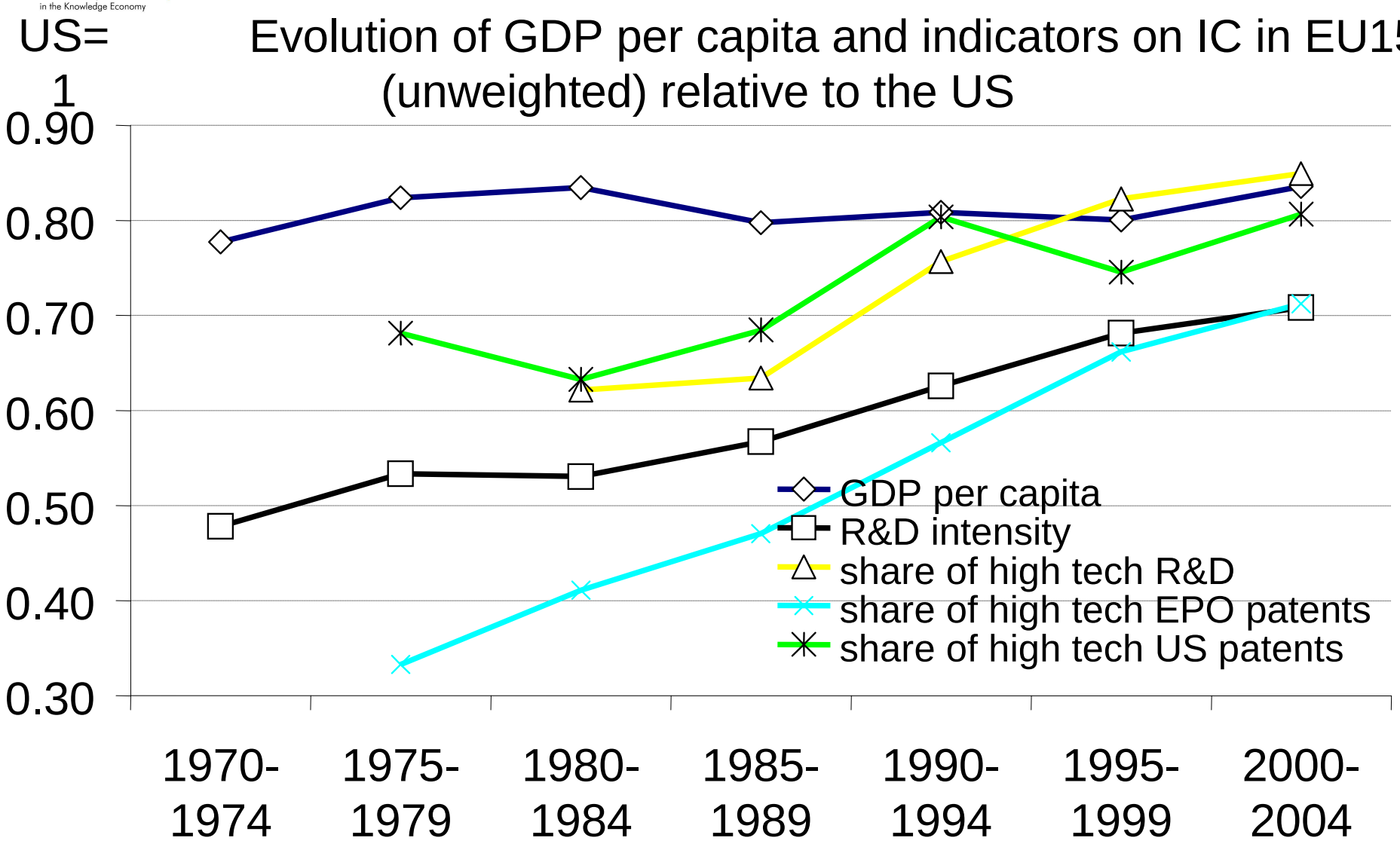
y: real per capita GDP in ppp in country i in period depends on:

$$\ln(y_{i,t}) = a\ln(y_{i,t-1}) + \ln(x_{i,t}\ )\delta + \eta_i + \lambda_t + \varepsilon_{i,t}$$

- η, λ: country and period specific effect, ß = 1-α: adjustment coefficient, long elasticities: $\delta/(1-\alpha)$
- Total investment, % GDP
- Indicators of intellectual capital:
  - Total R&D expenditures % GDP
  - R&D spending in the business sector % GDP
  - Share of High-tech EPO/USPTO patent applications
  - R&D expenditures in the high-tech sector % total R&D
- Estimation method: dynamic panel data technique using data for 22 OECD countries (5-year averages for 1960-2004)

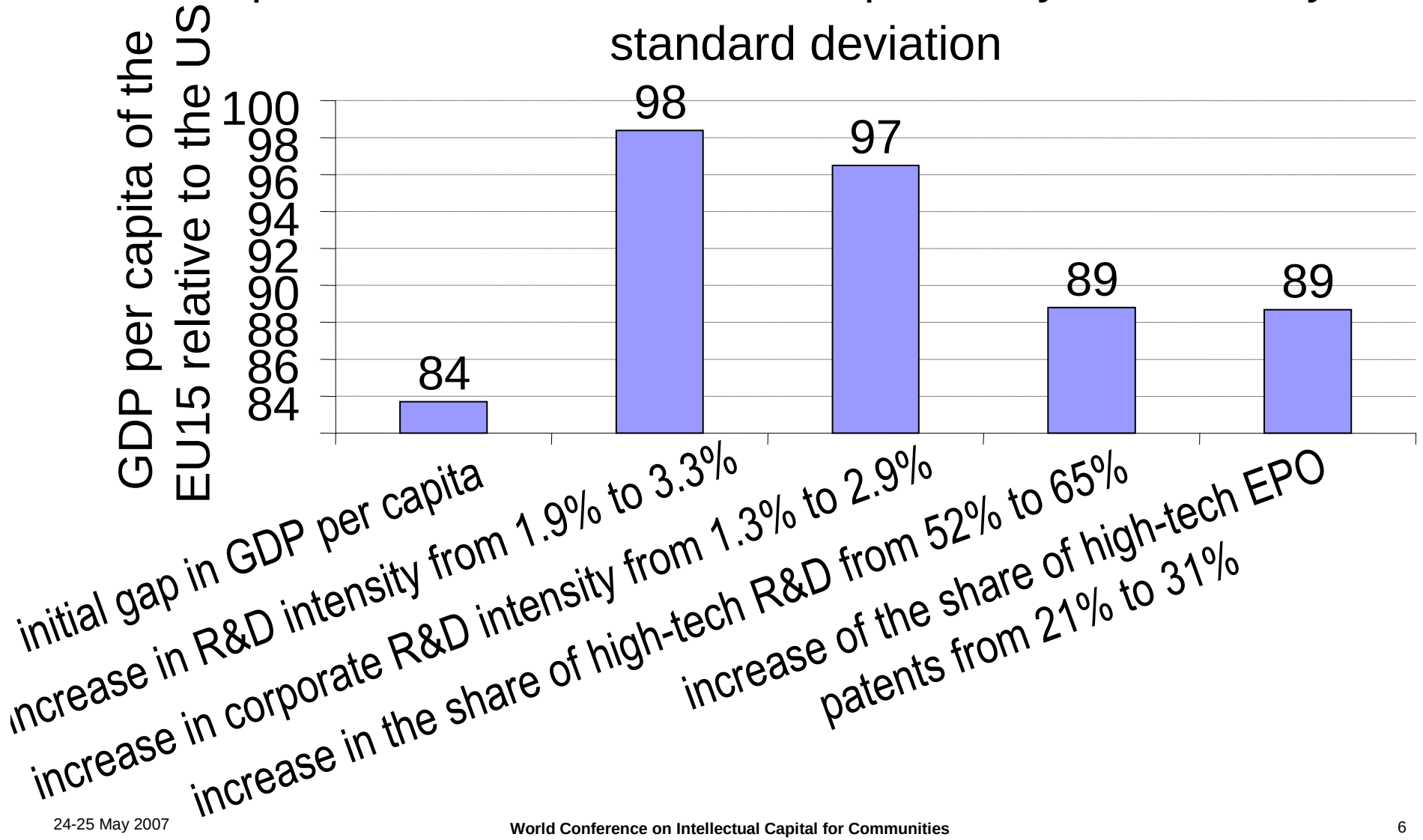
Descriptive statistics

Evolution of GDP per capita and indicators on IC in EU15 (unweighted) relative to the US



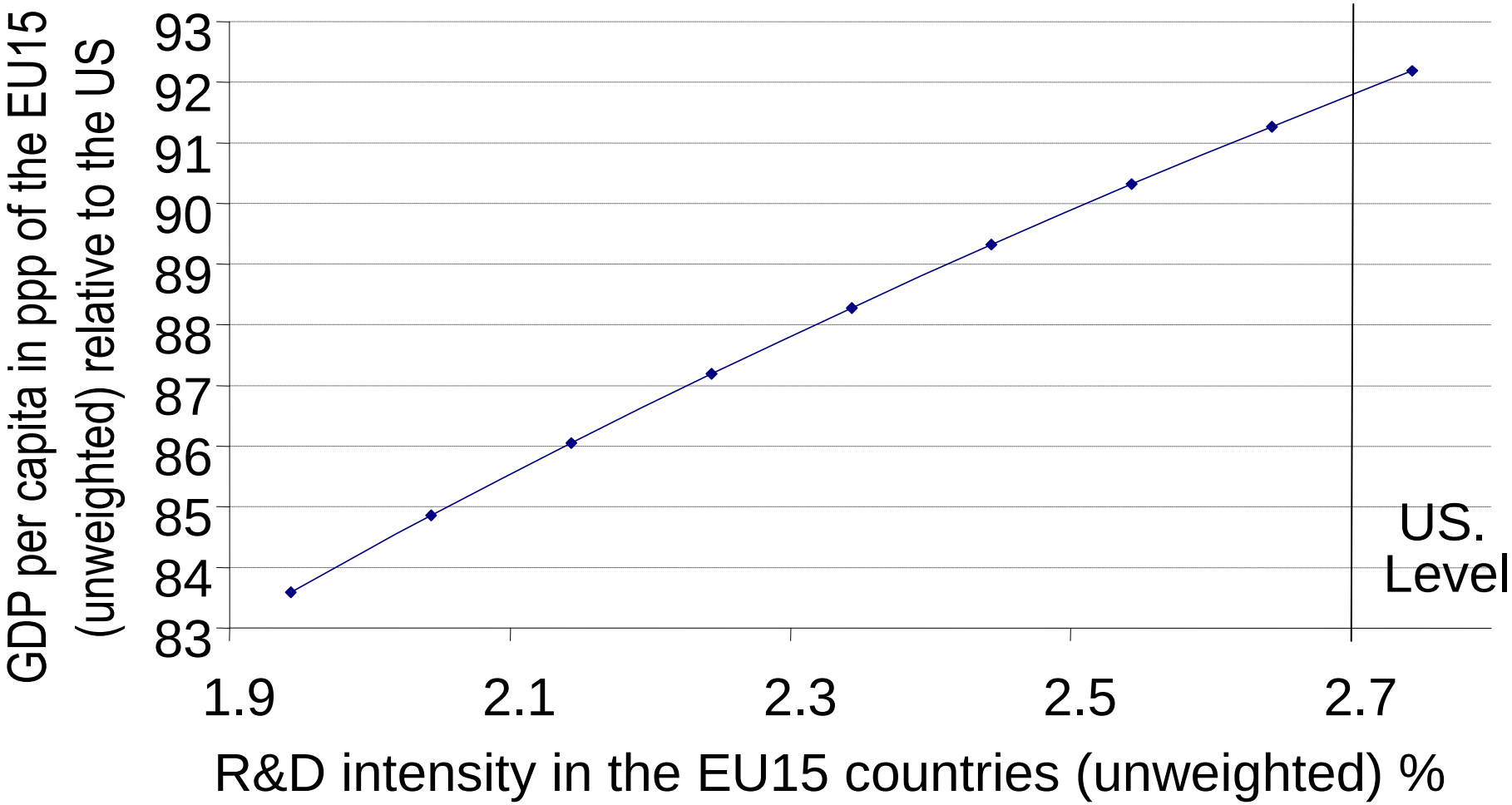
Empirical findings

Impact of the increase in the explanatory variables by one standard deviation



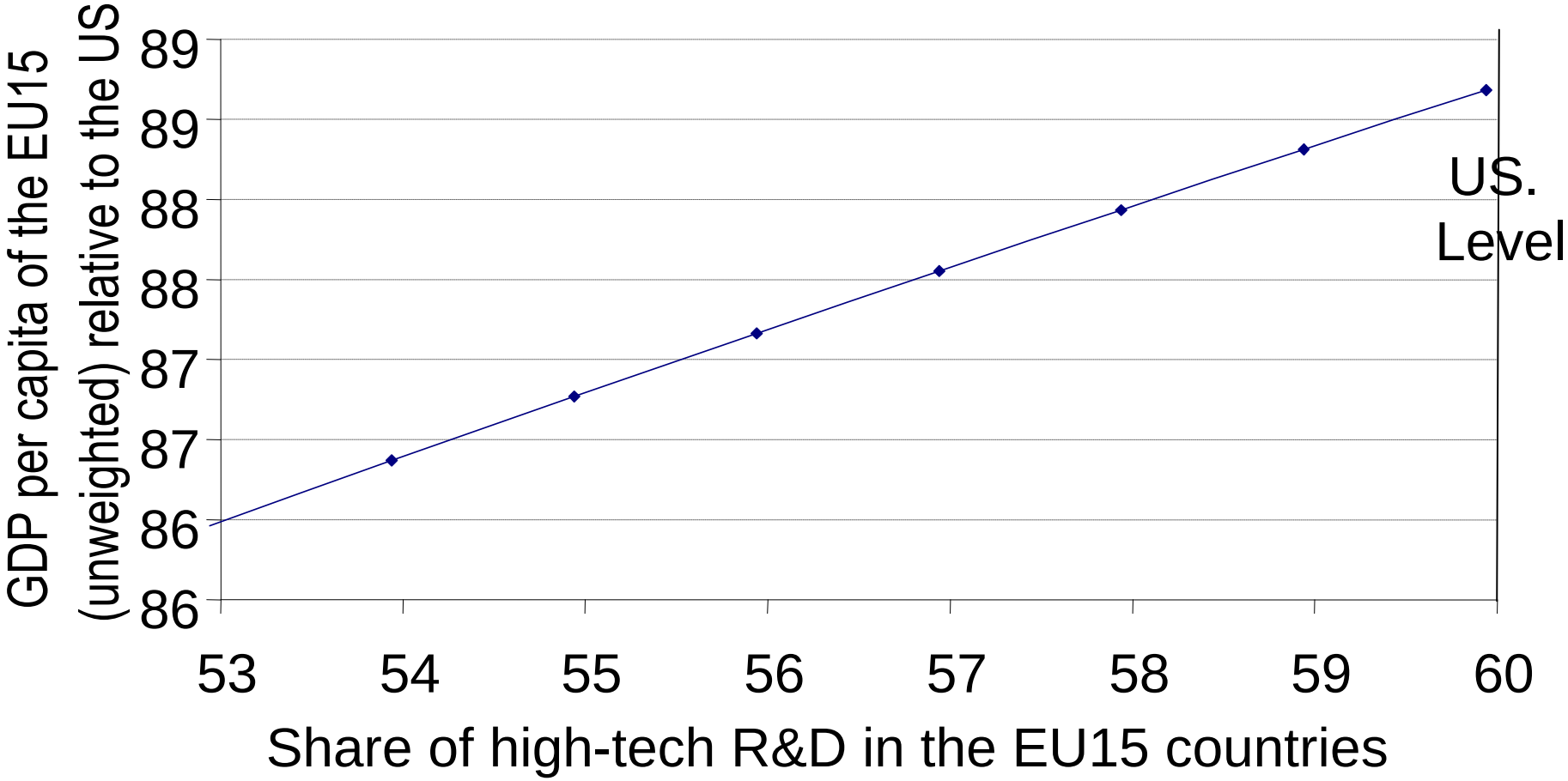
Empirical findings

Scenario 1: Impact of the increase in R&D intensity by 0.1 percentage points per year



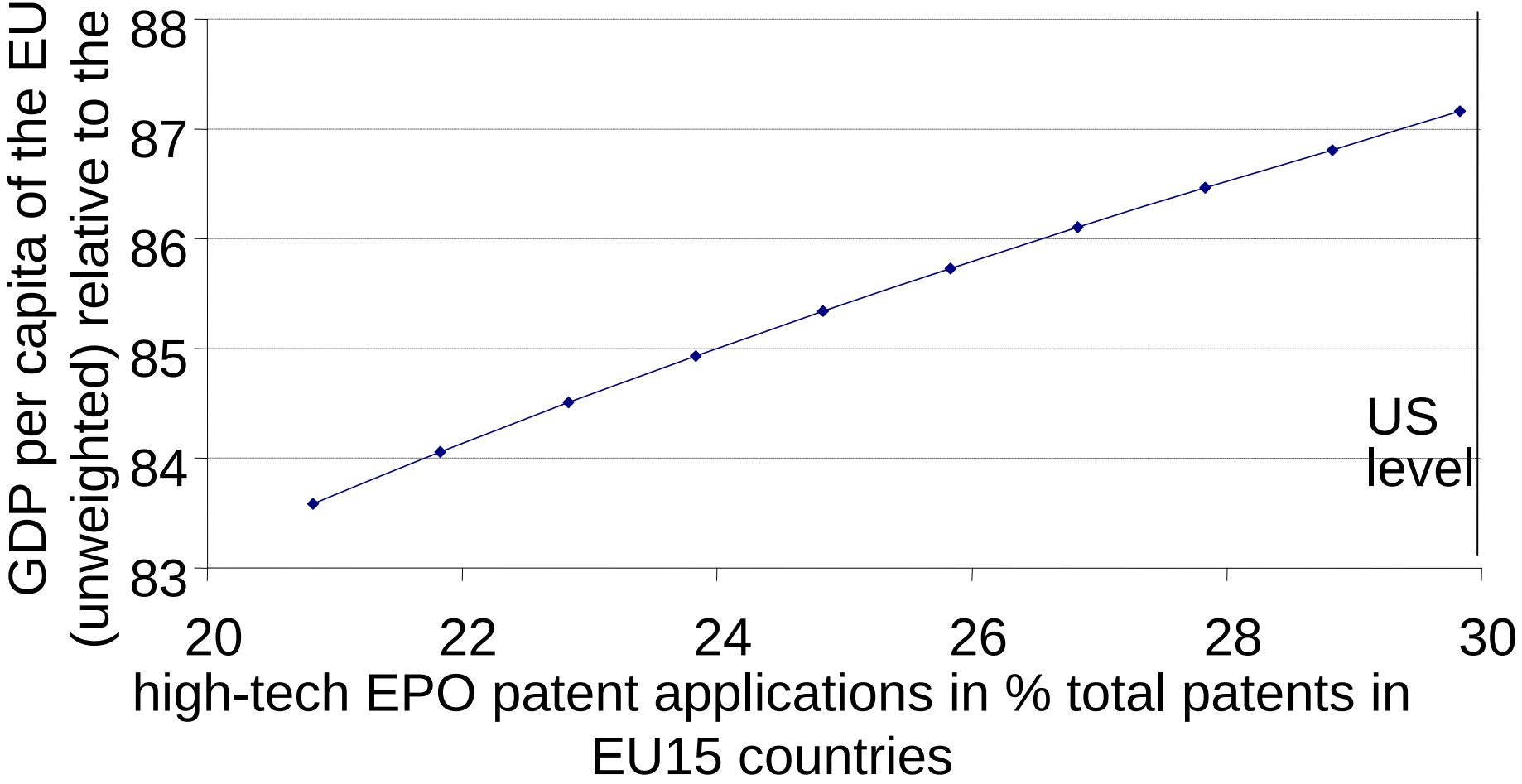
Empirical findings

Scenario 2: Impact of the increase in the share of high-tech R&D by 1 percentage point per year



Empirical findings

Scenario 3: Impact of the increase in the share of high tech EPO patent applications by 1 percentage point per year



Conclusion

- Significantly positive impact of R&D intensity and the share of share of R&D/patents in the high-tech sector/fields on the growth of GDP in working-age populations
- Magnitude of the effects: growth effects of R&D are larger than that of the share of high-tech R&D/patents
- Further accumulation of IC will diminish the gap in GDP per capita between the EU and the US
- Government policies should put more emphasis on complementary activities such as human capital formation, including public support for human capital