

# INVERSIÓN EN TICs Y PRODUCTIVIDAD: UN BREVE PANORAMA Y UNA PRIMERA APROXIMACIÓN AL CASO DE LAS REGIONES ESPAÑOLAS

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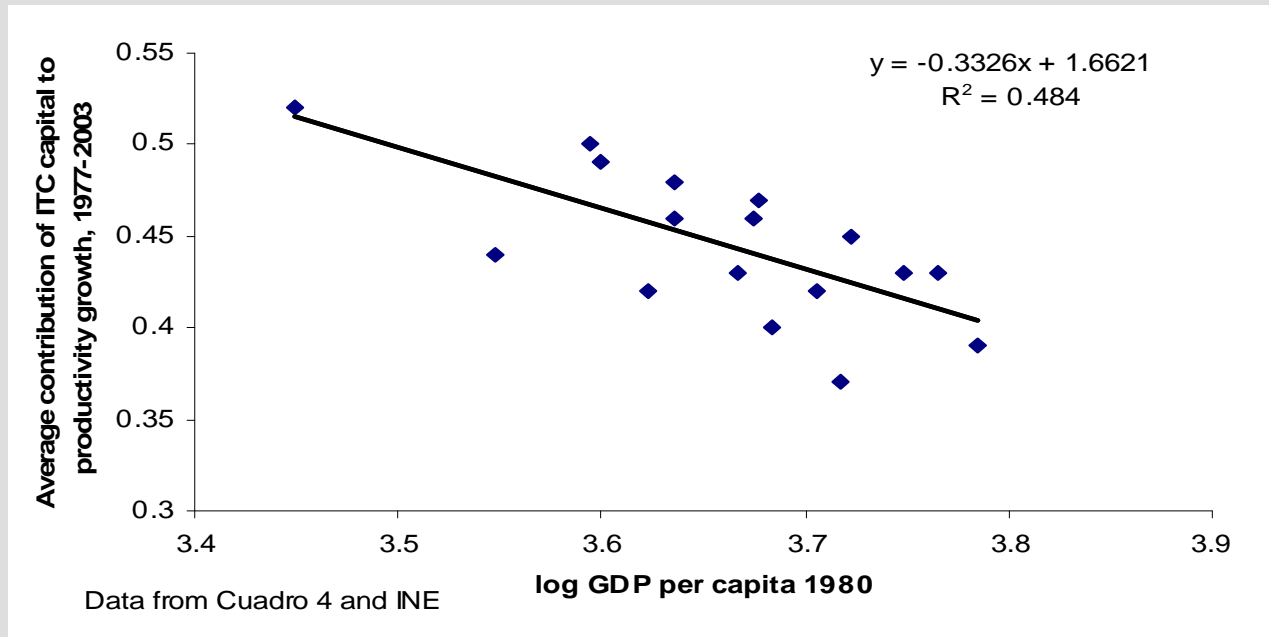
## 1. A brief summary

- **The first part of the paper presents some stylized facts regarding the role of ICT investment in total investment and in productivity growth, comparing the experiences of the US with those of Europe and Spain.**
  
- **It also surveys the literature on the relationship between the acceleration of labour productivity in the second half of the 90s and the boom in ICT investment in these economies.**
  - **Consensus seems to be that ICT investment has been a key driver**
  
- **Main aim (novelty) of the paper: quantify the contribution of ICT investment to growth and productivity differentials in Spanish regions**
  - **Estimation of aggregate production function to avoid uneasy assumptions, such as perfect competition...**
  - **...and makes use of a novel database**

## 1. A brief summary (cont'd)

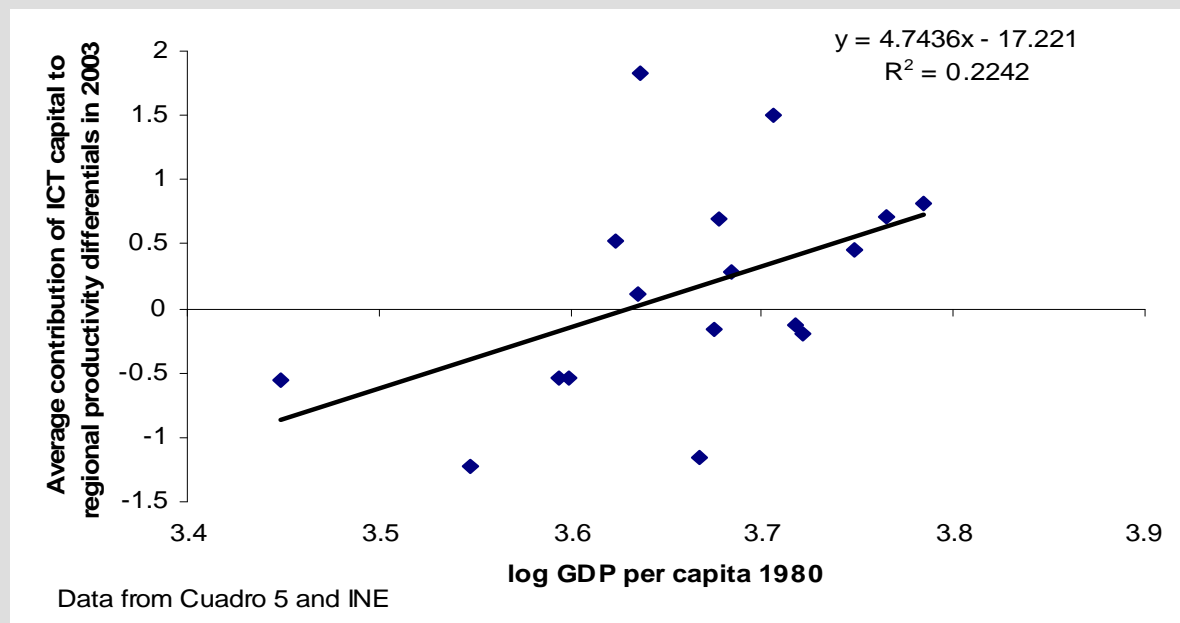
### ➤ The empirical analysis shows ...

- an increasing elasticity of output to ICT capital across regions, which goes beyond its share in value added
- and an increasing contribution of ICT capital to productivity growth, which, besides, is larger for the less developed regions



## 1. A brief summary (cont'd)

- and a roughly increasing contribution of ICT capital to regional disparities in the level of productivity, which, besides, is positively correlated with the level of income per capita



## 2. What is the role of knowledge capital?

- **It is difficult to believe that around 50% of productivity growth owes exclusively to ICT-related factors**
  - What about transport devices, oil companies, biotechnology, medicine, etc
  - What does all of this have in common? → **Innovation**
  
- **Hence, my question is: how can we disentangle the impact from ICT goods from the one derived from R&D activities/Knowledge generation?**
  - Both R&D and ICT investment share measurement and conceptual problems
  
- **Mairesse and Kocoglu (2005): there is an essential trade-off between the contribution of ICT capital to productivity growth and that which can be imputed to R&D: the more is attributed to ICT, the less to R&D**
  - The estimated contributions of R&D and ICT in the standard growth accounting framework both crucially depend on the size of quality adjustment –which is related to technological progress –. Hence, you have to decide what share of technological progress in ICT is imputed to R&D activities upstream, or downstream to production activities in ICT industries.

## 2. What is the role of knowledge capital?



- **Mairesse and Kocoglu find that when they account for both ICT and R&D investment and they make quality adjustments in both types of capital, the contribution to productivity growth is similar/more balanced in France and the USA.**
  - The rapid progress of ICT performance is to some extent due to the quality improvement of R&D investment

### 3. Econometrics

- **Endogeneity biases**: it is difficult to find good instrumental variables (IVs). A possibility might be to check robustness using the nonlinear GMM estimators proposed by Alan, Attanasio and Browning (2005) in the context of non-linear Euler equations for consumption, using lags of variables as IVs
- **Technological diffusion term**:  $\lambda(a_{M,t} - a_{r,t})$ 
  - There are some lags between the invention and the adoption of a technology
  - Check robustness with  $\lambda(a_{M,t-1} - a_{r,t-1})$  or  $\lambda(a_{M,t-2} - a_{r,t-2})$



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**THANKS FOR YOUR ATTENTION**

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