

*Economic Growth in Europe*  
*ZEW, Mannheim,*  
*February 23-24, 2006*

*Productivity growth and the role of  
creative destruction in Europe and  
the United States*

**Stefano Scarpetta**

**World Bank**

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# Road Map

- Motivation: growth, convergence, technical progress and the business environment
  - GDP/Capita levels and growth and their drivers
  - What is the role of the ICT-producing and using industries in OECD countries
- Looking at micro: firm dynamics, labor reallocation and productivity: how important is allocative efficiency for growth
- What could be the role of market characteristics, policy and institutions for productivity and allocation efficiency



# *Growth patterns over the past decade*

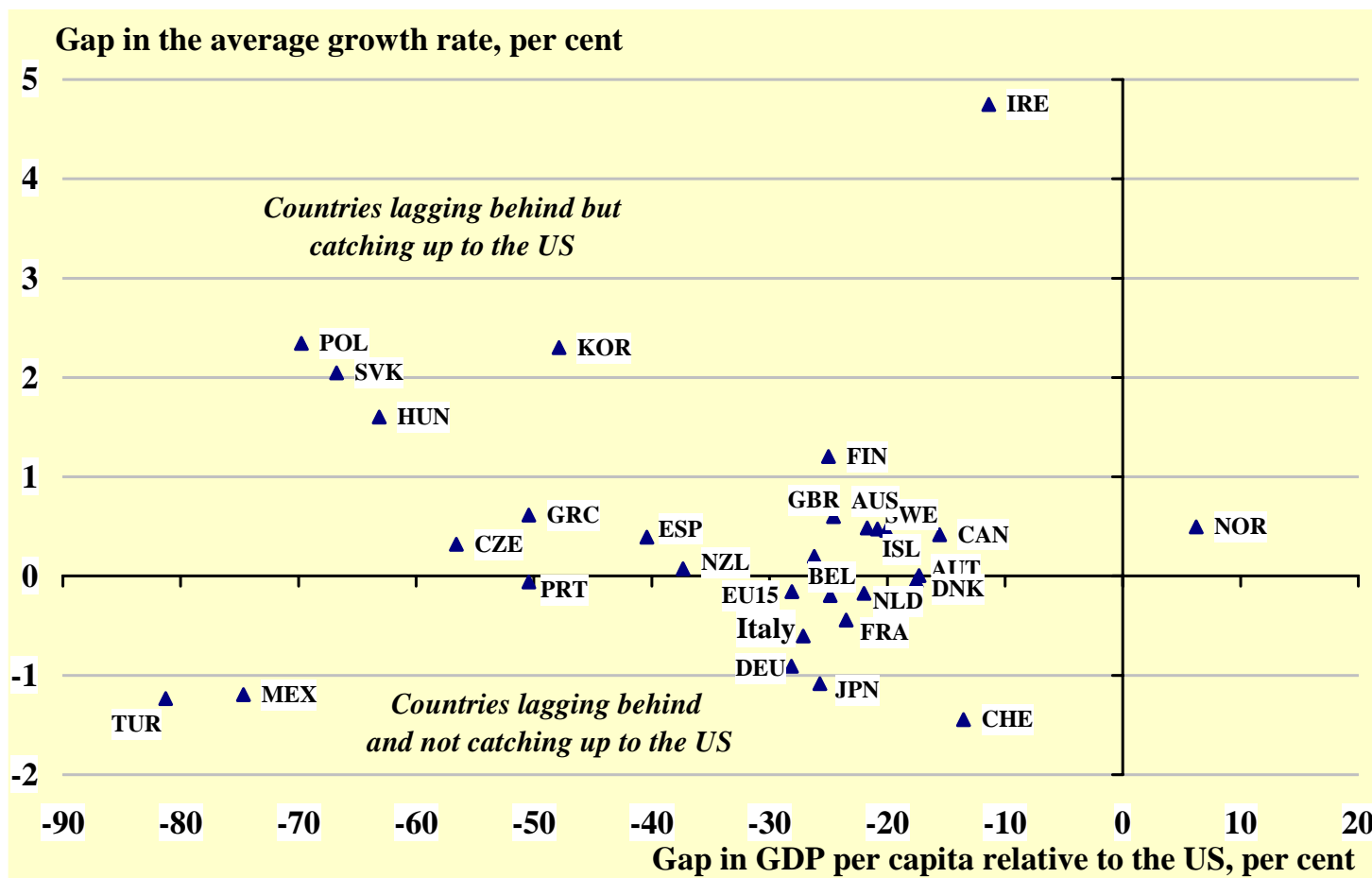
- Evidence of widening disparities in growth performance across OECD countries 
- Virtually all countries still have a gap *vis à vis* the United States
- In many countries the gap has been rising recently, after decades of convergence



# GDP p.c. levels and growth rates

## Who is catching up?

1994-2003

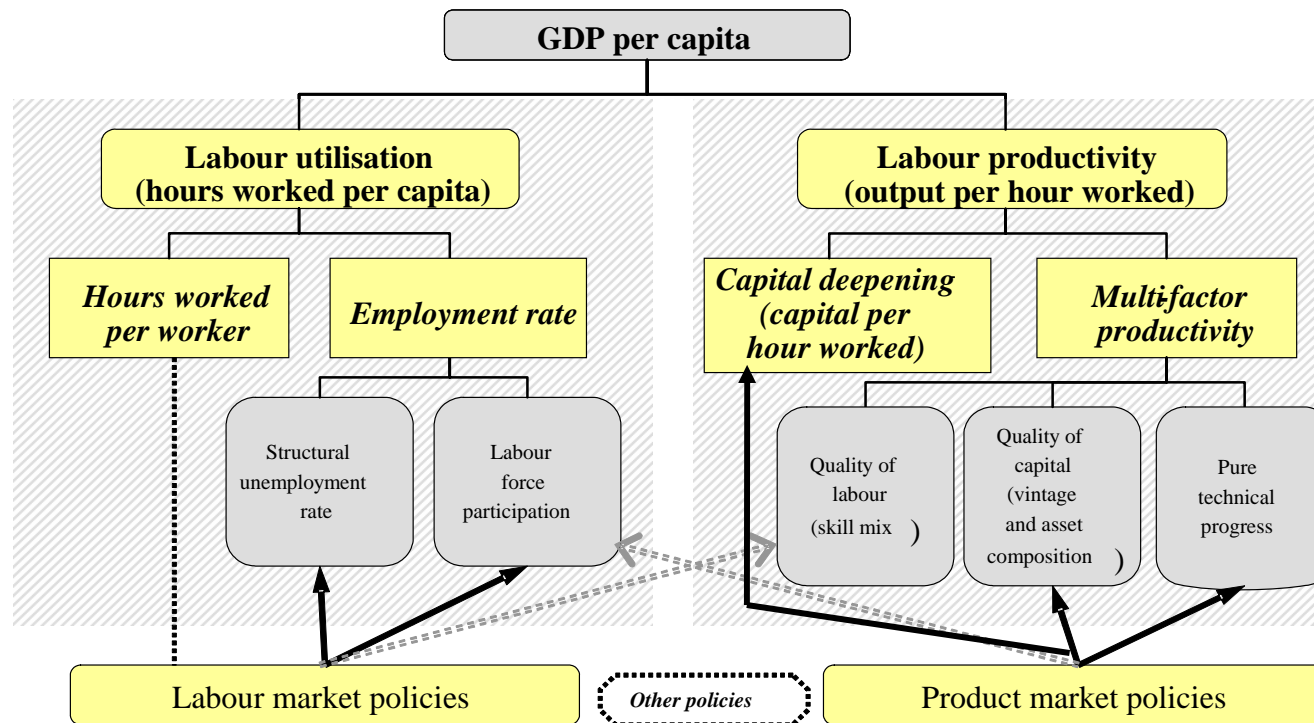


# *Explaining the GDP p.c. gaps*



- A simple accounting decomposition



# Proximate and policy determinants of GDP p.c.

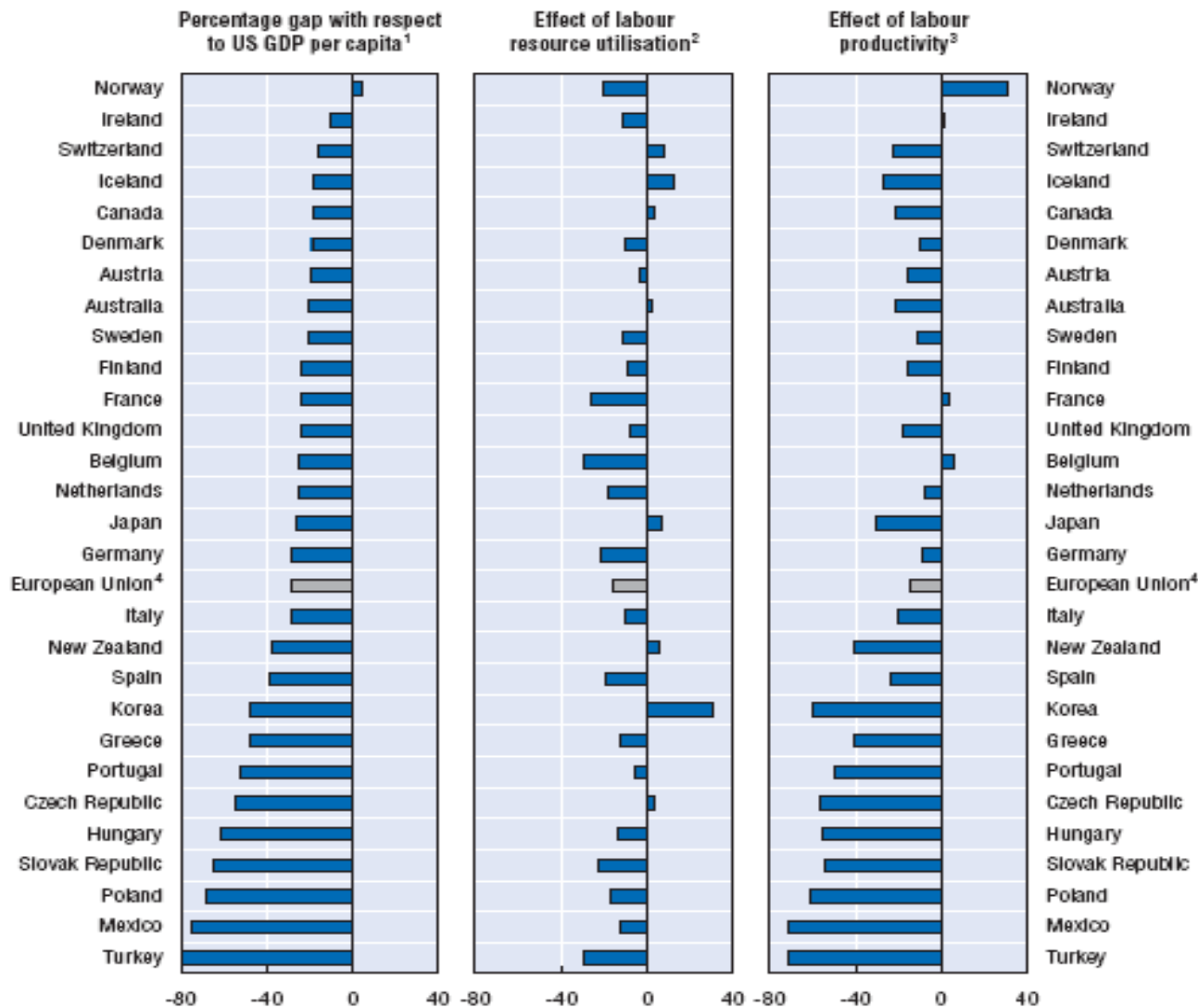


# *Explaining the GDP p.c. gaps*

- A simple accounting decomposition 
- Sources of gaps differ across the OECD: 
  - Low productivity is key in some countries (e.g. Japan)
  - Low labor utilization is key in other countries (e.g. EU)



# The sources of GDP p.c. gaps, 2004



1. Based on year 2000 purchasing power parities (PPPs).





# *Explaining the GDP p.c. gaps*

- A simple accounting decomposition
- Sources of gaps differ across the OECD:
  - Low productivity is key in some countries (e.g. Japan)
  - Low labor utilization is key in other countries (e.g. EU)
- But high observed productivity often matches low labor utilization, pointing to low « structural » productivity
  - No long-run employment-productivity trade off exists
  - Countries with low « structural » productivity need to accelerate growth in **both** productivity and labor utilization



# Observed and “structural” productivity

The productivity advantage of large EU countries partly reflects low labour utilisation

Observed and “structural” labour productivity as a percentage of the level in the US, 2002

	Observed hourly productivity	Adjustments		"Structural" hourly productivity
		<i>for differences in working time</i>	<i>for differences in the employment rate</i>	
		<i>% of the US level</i>	<i>% of the gap vs. the United States</i>	
	<i>a</i>	<i>d</i>	<i>e</i>	<i>f = a - d - e</i>
<b>EU</b>	84	4.4	5.3	74.3
<b>France</b>	107	5.2	7.5	94.3
<b>Germany</b>	91.6	7.2	4.6	79.8
<b>Italy</b>	96.6	3.8	11.3	81.5

Source: Authors' computations based on Artus and Cette (2004)



# *MFP patterns*

Caveat: simple Solow residual: difficult to control for changes in quality of labor and especially capital

- Some countries are filling the productivity gap with the US, but most aren't
- Only a few countries (among which the US!) experienced a productivity acceleration over the past decade
  - Notably, countries with low « structural » productivity failed to do so

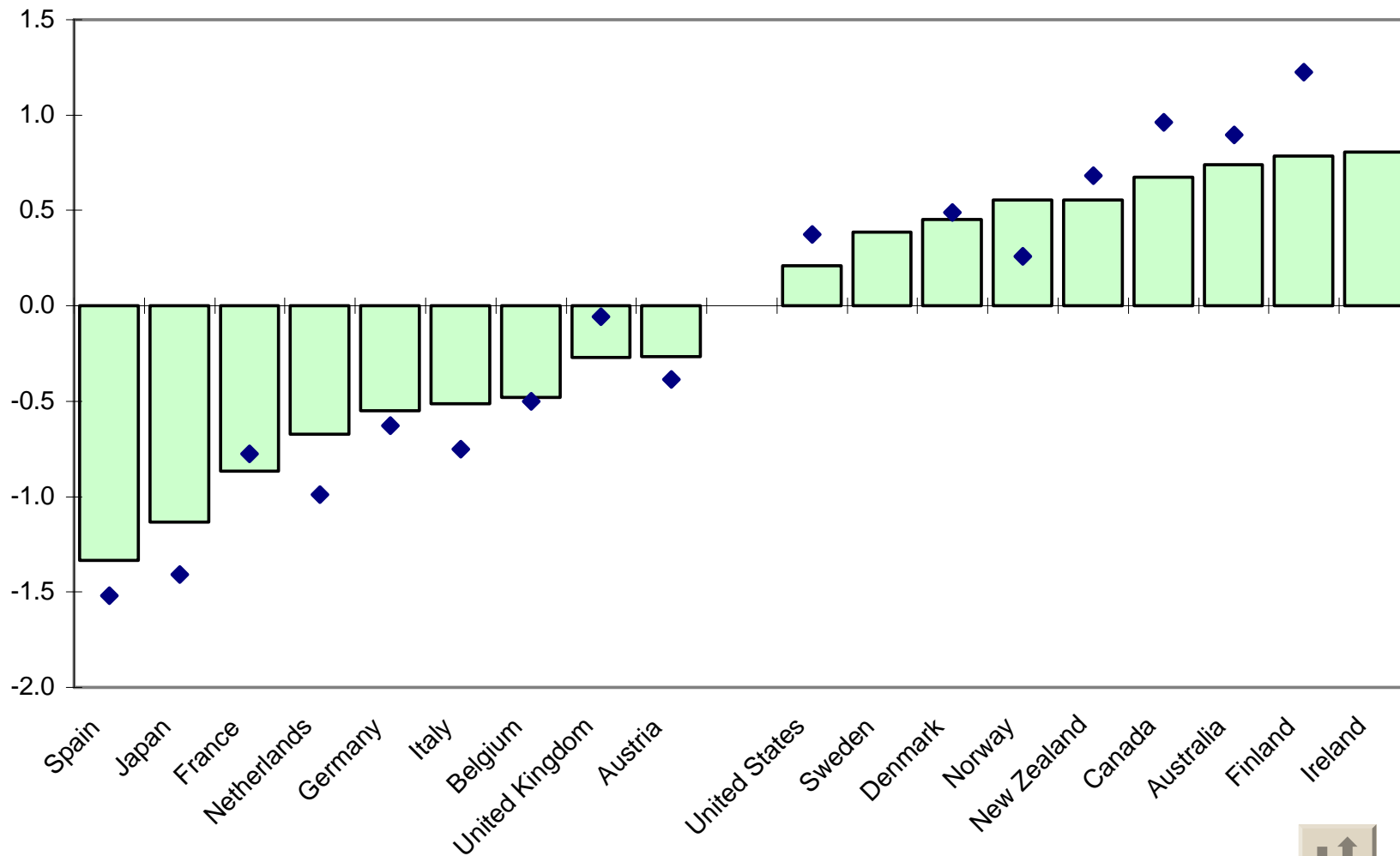


## Changes in MFP growth rates, (1990s<sup>1</sup> vs.1980s<sup>2</sup>)

Percentage point

□ (1990-2000)-(1980-1990)

◆ (1995-2000)-(1980-1990)



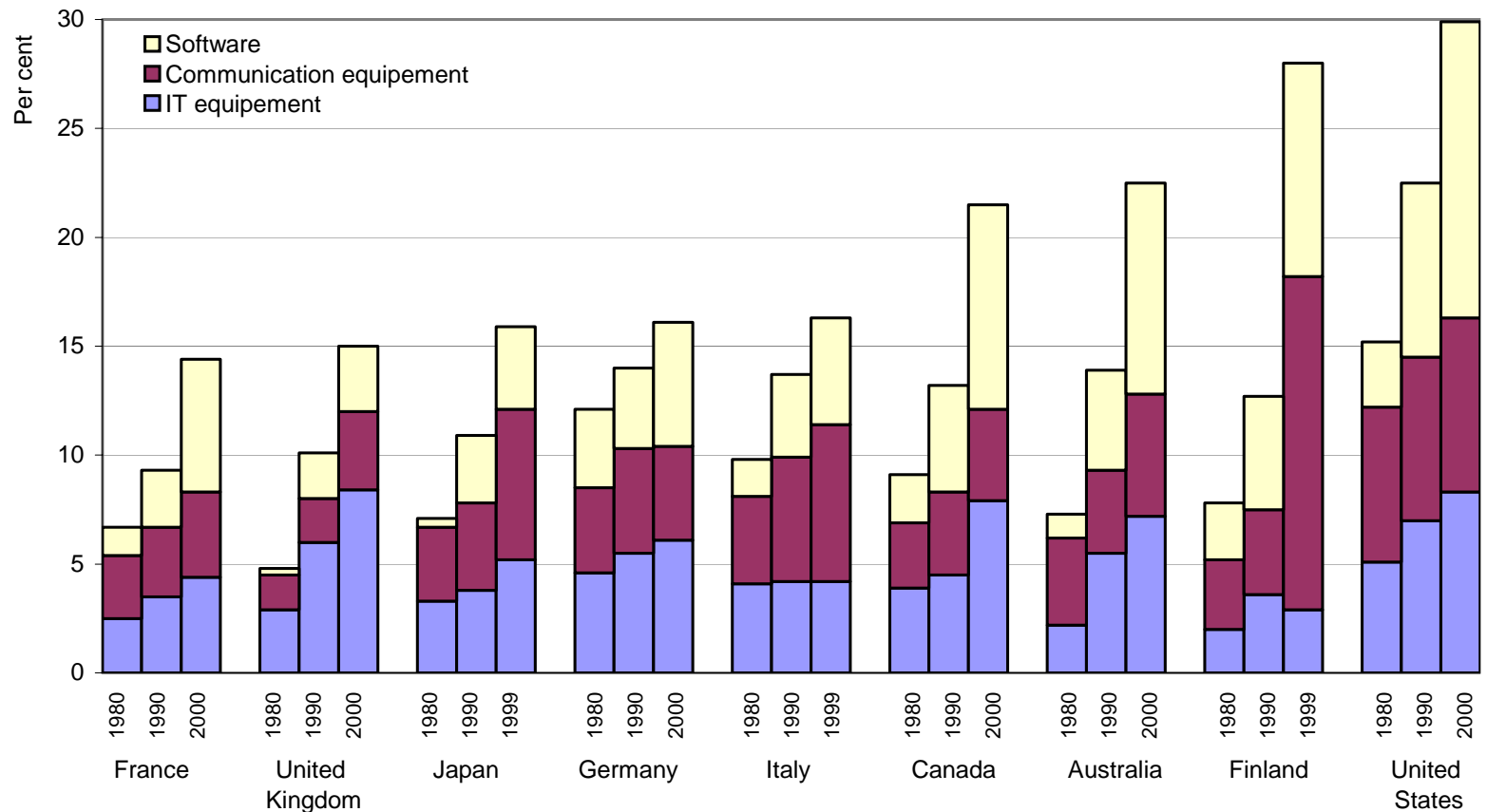
# *What has driven growth?*

- Capital quality has been crucial in explaining cross-country differences in growth
  - Capital quality strong influenced by the shift towards ICT, even after the hype of the late 1990s



# Percentage share of ICT investment in total non-residential investment

Current prices, 1980-2000



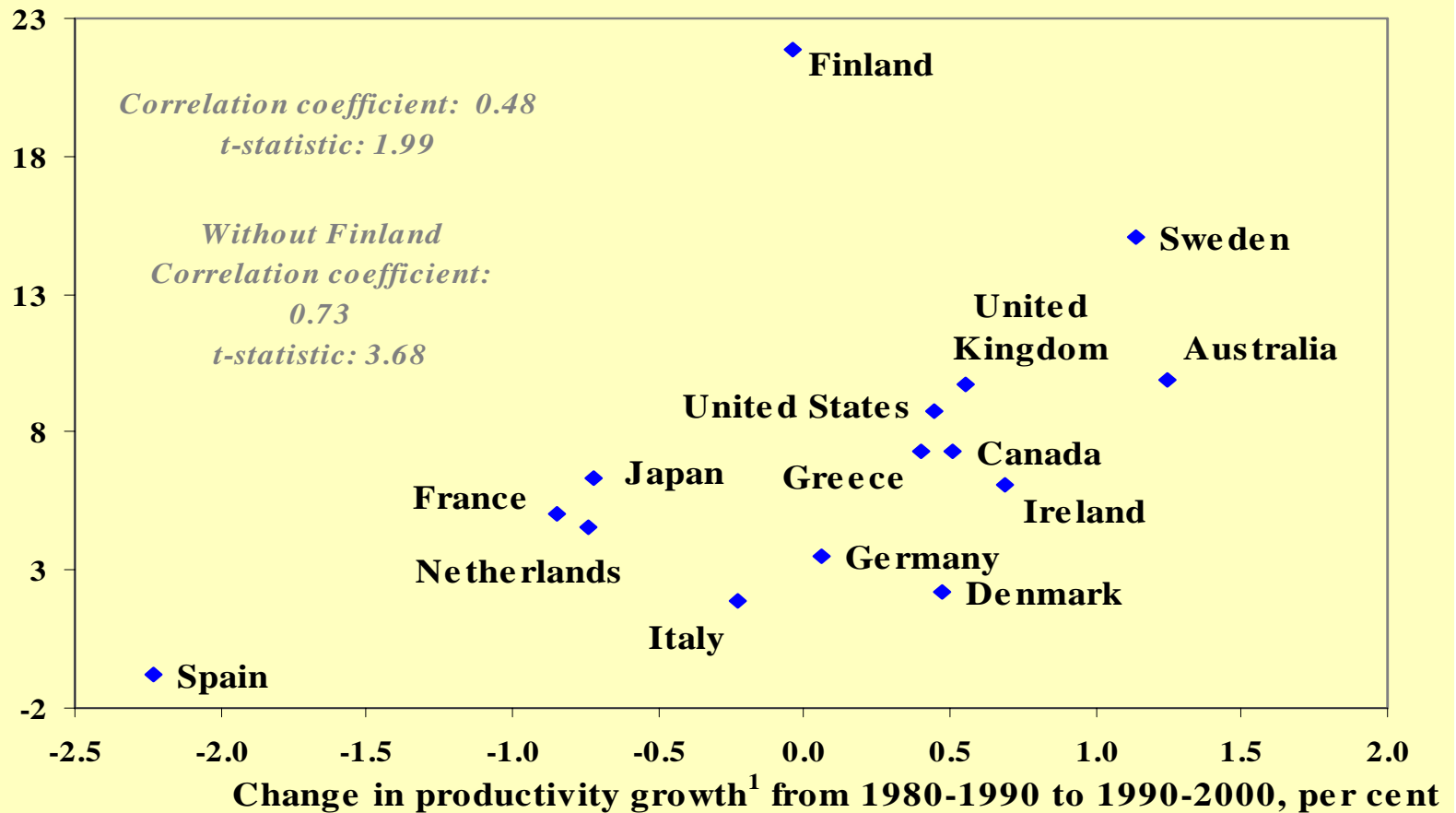
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# Productivity acceleration and ICT investment

Change in ICT investment as % of GFCF, 1990-2000





# *What has driven growth?*

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- The effect of ICT is not only through strong MFP in ICT-producing industries, but also ICT-driven acceleration in MFP in ICT-using industries

**Caveat: harmonization of price indexes for different products are essential (hedonic adjustment)**



# *What is the role of policy and institutions?*

 In countries that extensively reformed product markets:

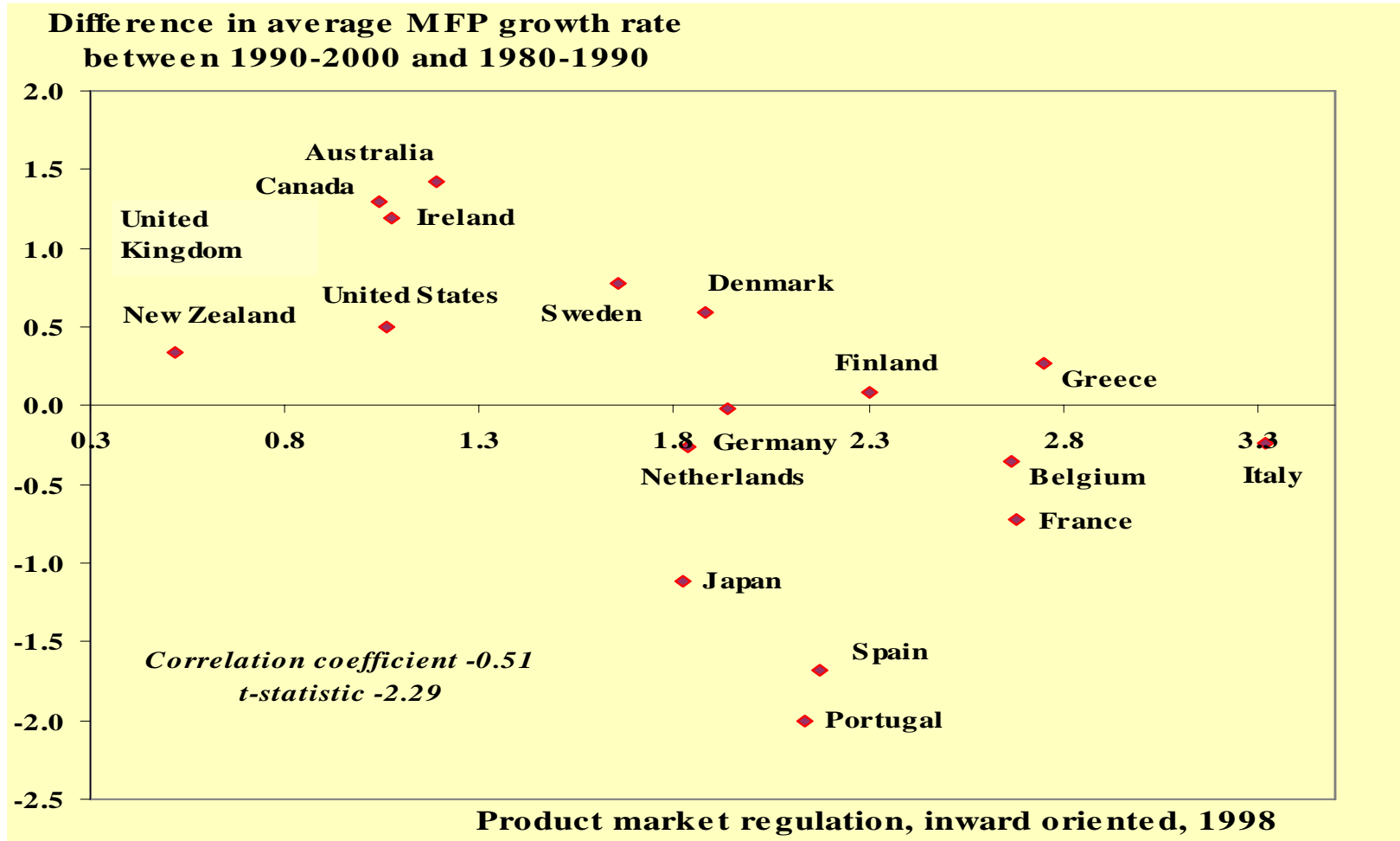
- **multifactor productivity (MFP) accelerated over the past two decades**
- **ICT-using service industries contributed more strongly to aggregate labour productivity growth**

 Multivariate panel estimates over countries and industries suggest that *(Nicoletti and Scarpetta, 2003)* :

- **MFP growth rises as the overall regulatory environment is eased**
- **the lower are entry barriers (including trade barriers), the faster is catch-up to best practice in manufacturing industries**
- **long-run costs of restrictive regulation are higher where MFP is farther from the technology frontier**
- **reforms in non-manufacturing increase manufacturing productivity through input-output linkages** *(Faini et al. 2005)*

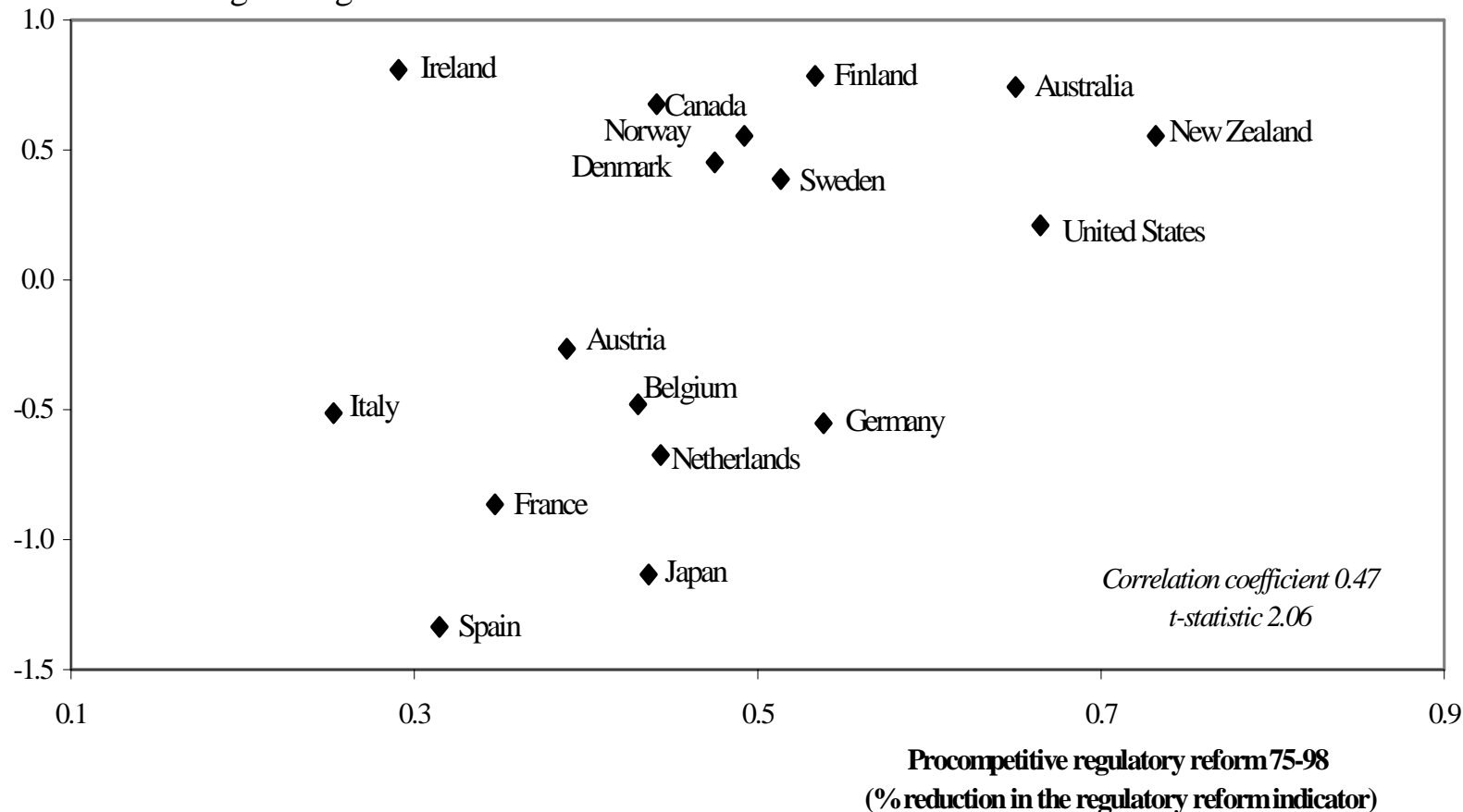


# Regulation and MFP acceleration



# Changes in PM regulations and the acceleration of MFP

Difference in average MFP growth rate between 1990-2000 and 1980-1990<sup>1</sup>



## *Going deeper: firm level analysis*

- Often difficult to assess role of policy and institutions at the aggregate levels: too many possible explanatory factors
- Ideally, we would like to test hypotheses of how policy influence firms' and workers' behaviors leading to different aggregate outcomes
- For example:
  - Role of firm and worker churning for productivity and employment
  - How regulations affect churning and its effectiveness
  - How reforms— including trade reforms and PM reforms— changes incentives for firms to invest and hire workers



# *Firm level analyses: the quest for data*

- Many country studies have shed light on firm dynamics, allocative efficiency and productivity
- Meta-analysis of results from micro studies
  - A challenge to control for data, method, and context
  - Little within-country variation in policy (e.g. before and after)
- Cross-country longitudinal micro dataset
  - Generally not possible (disclosure)
  - EUROSTAT attempting to build EU panel, but from existing databases



## *Data sources*

- Business registers for firm demographics
  - Firm level, at least one employee, 2/3-digit industry
- Enterprise surveys for productivity analysis
- Countries:
  - 10 OECD
  - 5 Central and Eastern Europe; 6 Latin America; 3 East Asia
- Data are disaggregated by:
  - industry (2-3 digit);
  - size classes 1-9; 10-19; 20-49; 50-99; 100-249; 250-499; 500+ (for OECD sample the groups between 1 and 20 and the groups between 100 and 500 are combined)
  - Time (late 1980s – late 1990s)



# *The key features of firm churning*

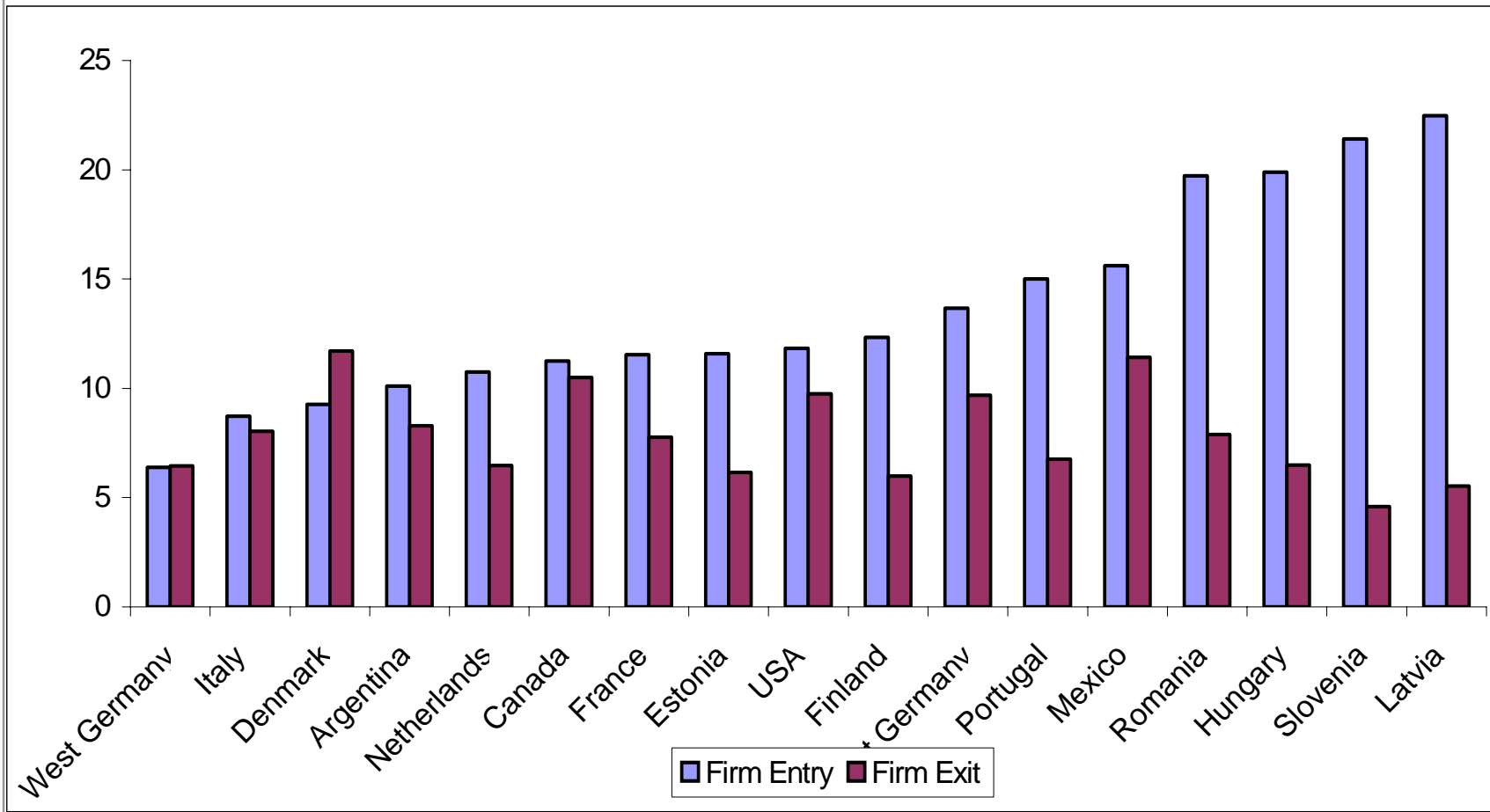
- The magnitude of firm churning







# Firm entry and exit rates

Total business sector, firms with at least 1 employee



# *The key features of firm churning*

- The magnitude of firm churning 
- The characteristics of entrants and exiting firms 








### Relative Size of Entrants Employment 1+, 1988+, All Economy

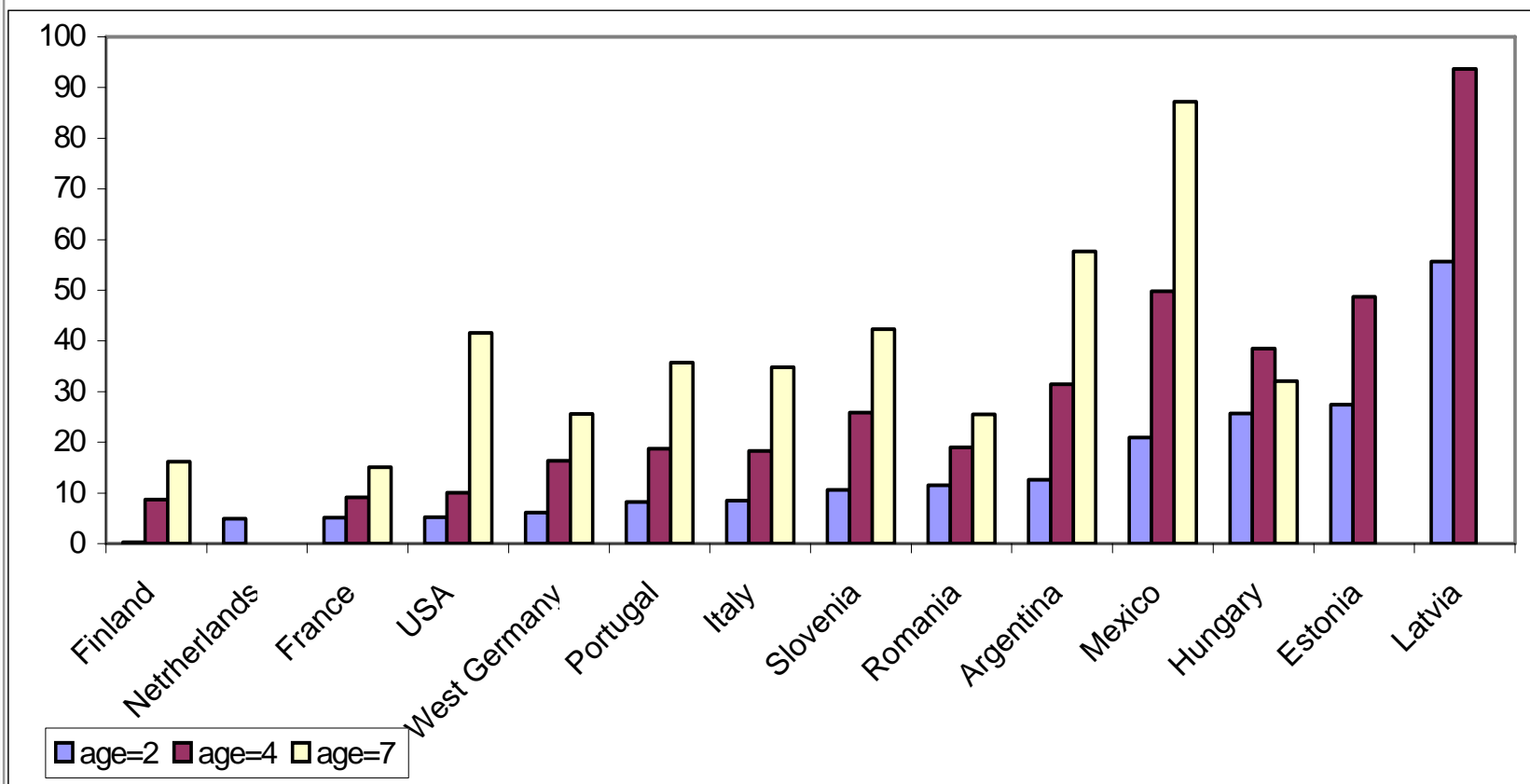


# *The key features of firm churning*

- The magnitude of firm churning 
- The characteristics of entrants and exiting firms 
- The post-entry performance of successful entrants 



# Average firm size growth relative to entry, by age



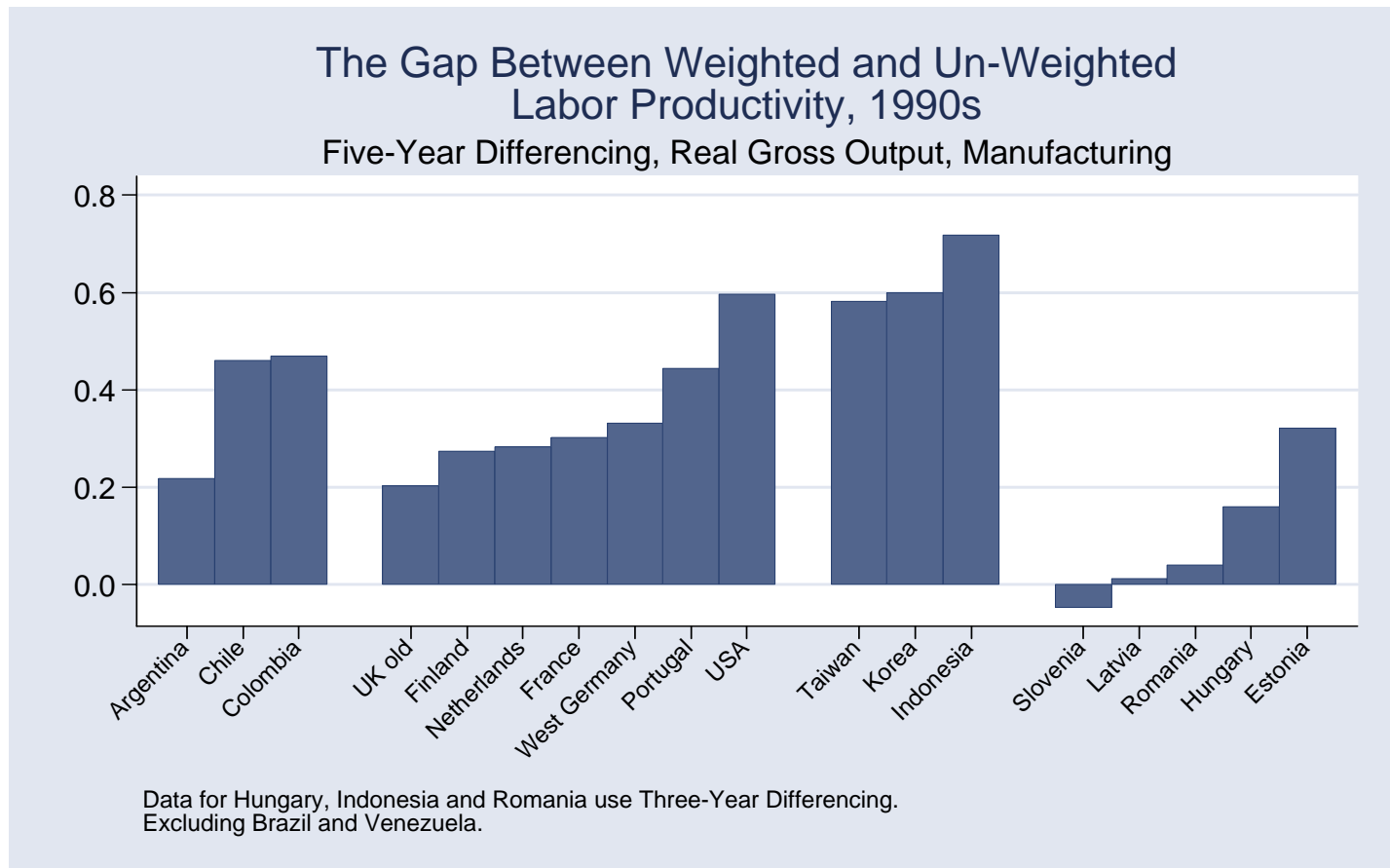
# *Assessing the role of allocative efficiency for productivity*

- The cross-sectional efficiency of resource allocation



# Allocative efficiency : static analysis – Olley-Pakes decomposition, avg. 1990s

$$P_t = (1/N_t) \sum_i P_{it} + \sum_i \Delta\theta_{it} \Delta P_{it}$$



# *Assessing the role of firm dynamics on productivity*

- The cross-sectional efficiency of resource allocation
- The dynamic efficiency: the role of entry and exit

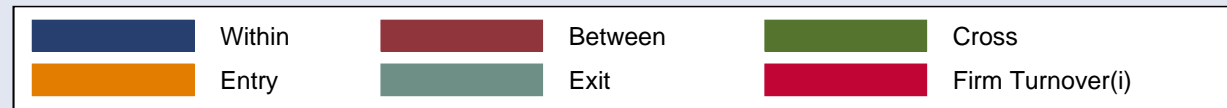
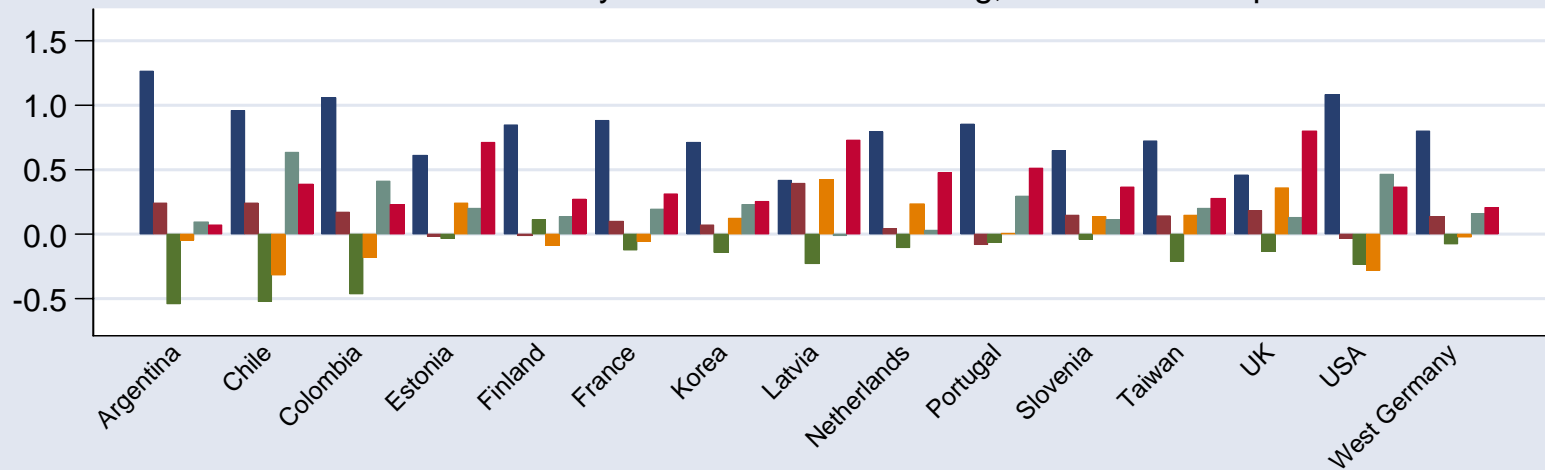




# Dynamic efficiency: the role of entry and exit in reallocating resources towards more productive uses, FHK approach

$$\Delta P_t = \sum_{i \in C} \bar{\theta}_i \Delta p_{it} + \sum_{i \in C} \Delta \theta_{it} (\bar{p}_i - \bar{P}) + \sum_{i \in N} \theta_{it} (p_{it} - \bar{P}) - \sum_{i \in X} \theta_{it-k} (p_{it-k} - \bar{P})$$

FHK Decomposition Shares - Manufacturing  
Labor Productivity - Five-Year Differencing, Real Gross Output

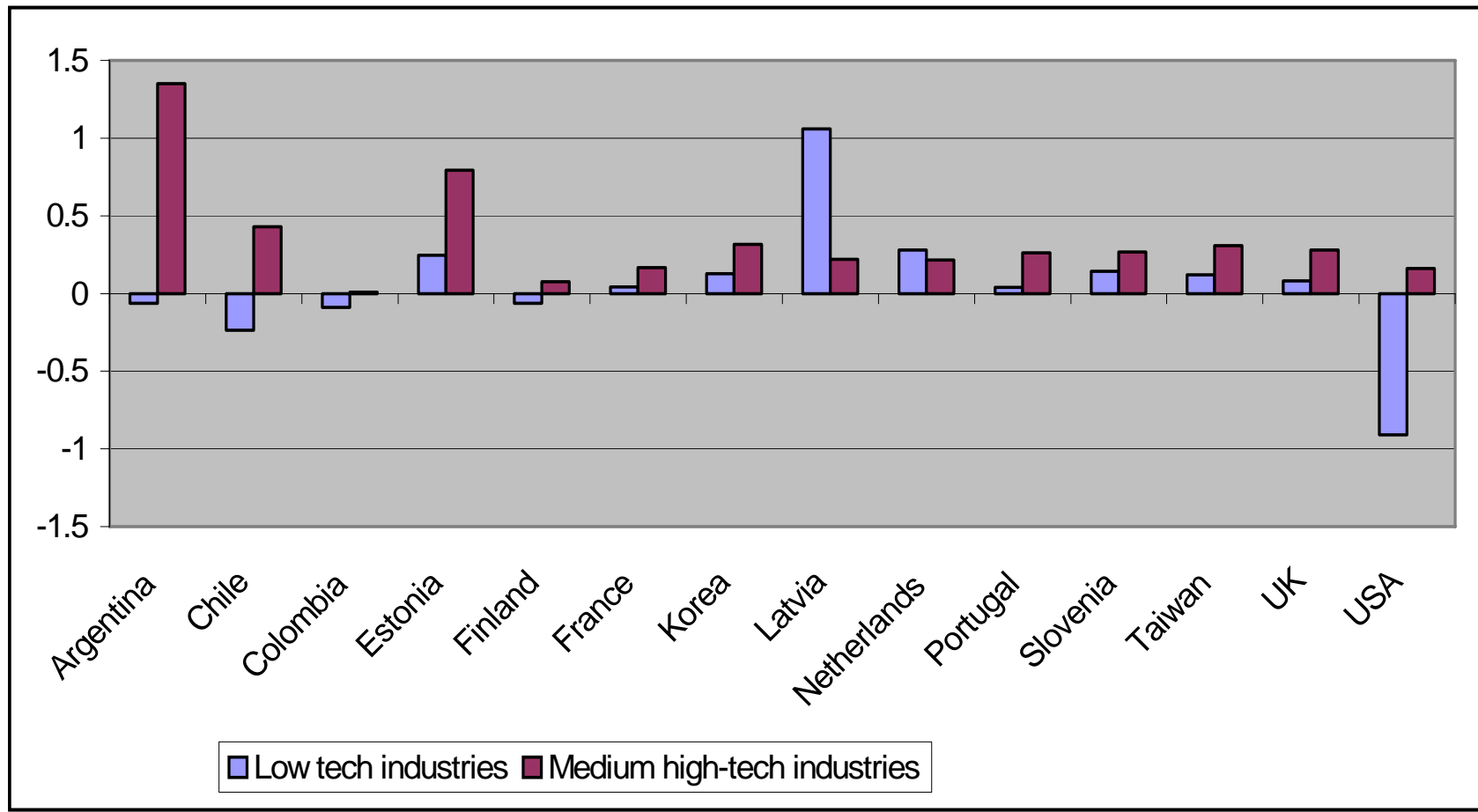


Argentina: 1995-2001. Chile: 1985-1999. Colombia: 1987-1998. Estonia: 2000-2001.  
Finland: 2000-2002. France: 1990-1995. West Germany: 2000-2002. Korea: 1988 & 1993.  
Latvia: 2001-2002. Netherlands: 1992-2001. Portugal: 1991-1994. Slovenia: 1997-2001.  
Taiwan: 1986, 1991 & 1996. UK: 2000-2001. USA: 1992 & 1997.  
Excluding Brazil and Venezuela.



# Dynamic efficiency: the importance of “technology factors”

Contribution of entry to labor productivity growth, five year differencing, gross output

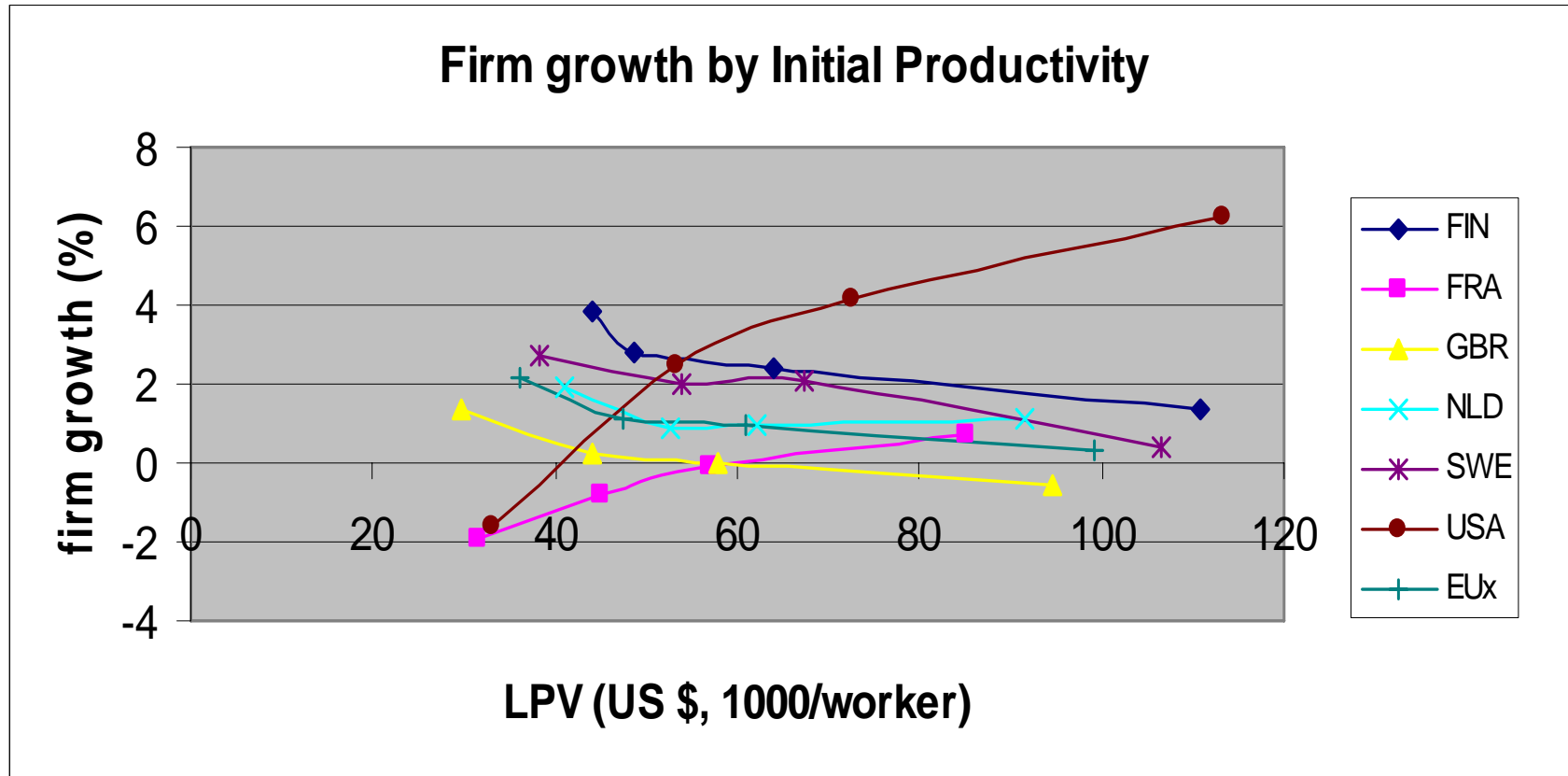


# *Assessing the role of firm dynamics on productivity*

- The cross-sectional efficiency of resource allocation
- The dynamic efficiency: the role of entry and exit
- The heterogeneity of firms and the effects on productivity



# *The heterogeneity of firms: labor productivity and growth*

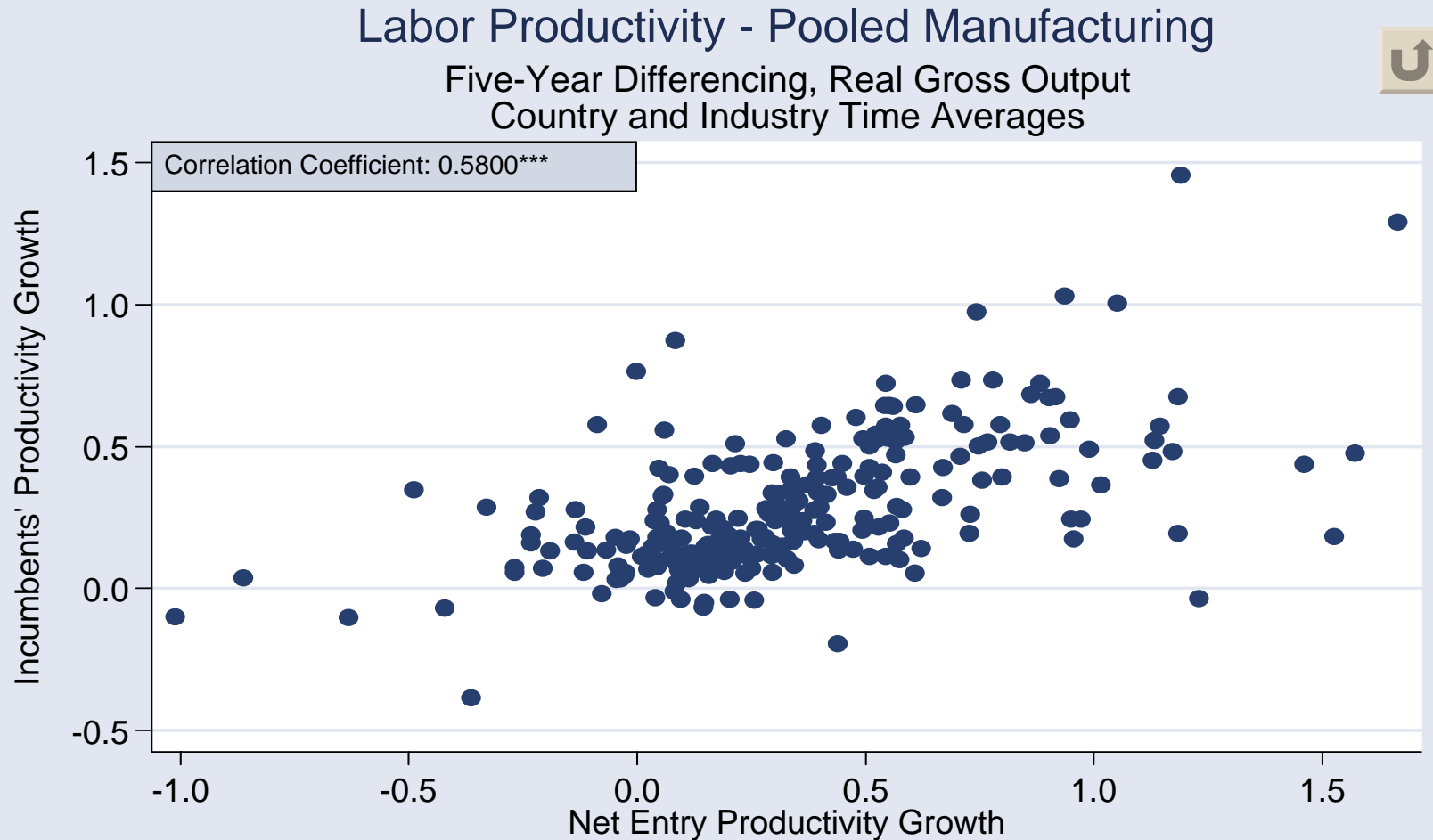


# *Assessing the role of firm dynamics on productivity*

- The cross-sectional efficiency of resource allocation
- The dynamic efficiency: the role of entry and exit
- The heterogeneity of firms and the effects on productivity
- The indirect effect of firm churning on productivity: market contestability



# *The indirect effect : market contestability*



Note: Excluding Brazil and Venezuela. Outliers Excluded.



# Back to the role of policy and institutions: U.S. vs Europe:

- Similar degree of firm churning and ‘infant mortality’ in Europe and in the United States.
- But in the US vs EU:
  - smaller relative size of entering firms;
  - a lower level of labour productivity of entrants relative to the average incumbent;
  - much stronger expansion of successful entrants in the initial years;
  - Wider dispersion of productivity levels across firms
  - higher allocative efficiency
- These differences may point to a different degree of “market experimentation” in the U.S. than in Europe. Why?
  - More market-based financial system
  - Lower administrative costs of start up
  - Lower costs of adjusting the workforce to accommodate changes in demand

