

ICT and Europe's Productivity Performance Industry-level Growth Account Comparisons with the United States

Robert Inklaar, Mary O'Mahony and Marcel Timmer
28 February 2004, Fukuoka workshop

EU-U.S. growth divergence

United States

- Labour productivity acceleration after 1995
- Faster ICT investment
- Accelerating Total Factor Productivity (TFP) growth
- ICT users grow faster

Europe

- Labour productivity slowdown after 1995
- Lagging ICT investment
- Constant TFP growth
- Slower non-ICT investment

Main Findings

- U.S. TFP acceleration is not limited to ICT producers => ICT users important too
- Same industries in Europe and U.S. make large ICT investment: trade, finance, business services
- Slowdown in non-ICT investment widespread and important
- Wage moderation main suspect

Growth accounting framework

- Follow standard growth accounting framework of Jorgenson & Griliches (1967).

$$\dot{y} = v_L \dot{q} + v_{ICT} \dot{k}_{ICT} + v_N \dot{k}_N + tfp$$

\downarrow \downarrow \downarrow \downarrow \downarrow

Labour productivity growth	Labour quality contribution	ICT capital deepening contribution	Non-ICT capital deepening contribution	TFP growth
----------------------------------	--------------------------------	------------------------------------------	-------------------------------------------------	------------

Data (1)

- 26 comparable industries:
 - ◆ 13 manufacturing
 - ◆ 13 non-manufacturing
- 1979-2000/2001
- France, Germany, Netherlands, UK, U.S.
 - ◆ Four EU countries aggregated to EU-4
 - ◆ +/- 70% of EU-15 GDP

Data (2)

- Investment in 6 capital assets for each industry
 - ◆ 3 ICT assets: hardware, communication and software
 - ◆ 3 Non-ICT: buildings, machinery, transport
- Different labour categories by industry
 - ◆ 3-7 educational attainment categories
- Use U.S. deflators for ICT
 - ◆ Apply at detailed industry and asset level
 - ◆ Improvement over non-quality adjusted deflators

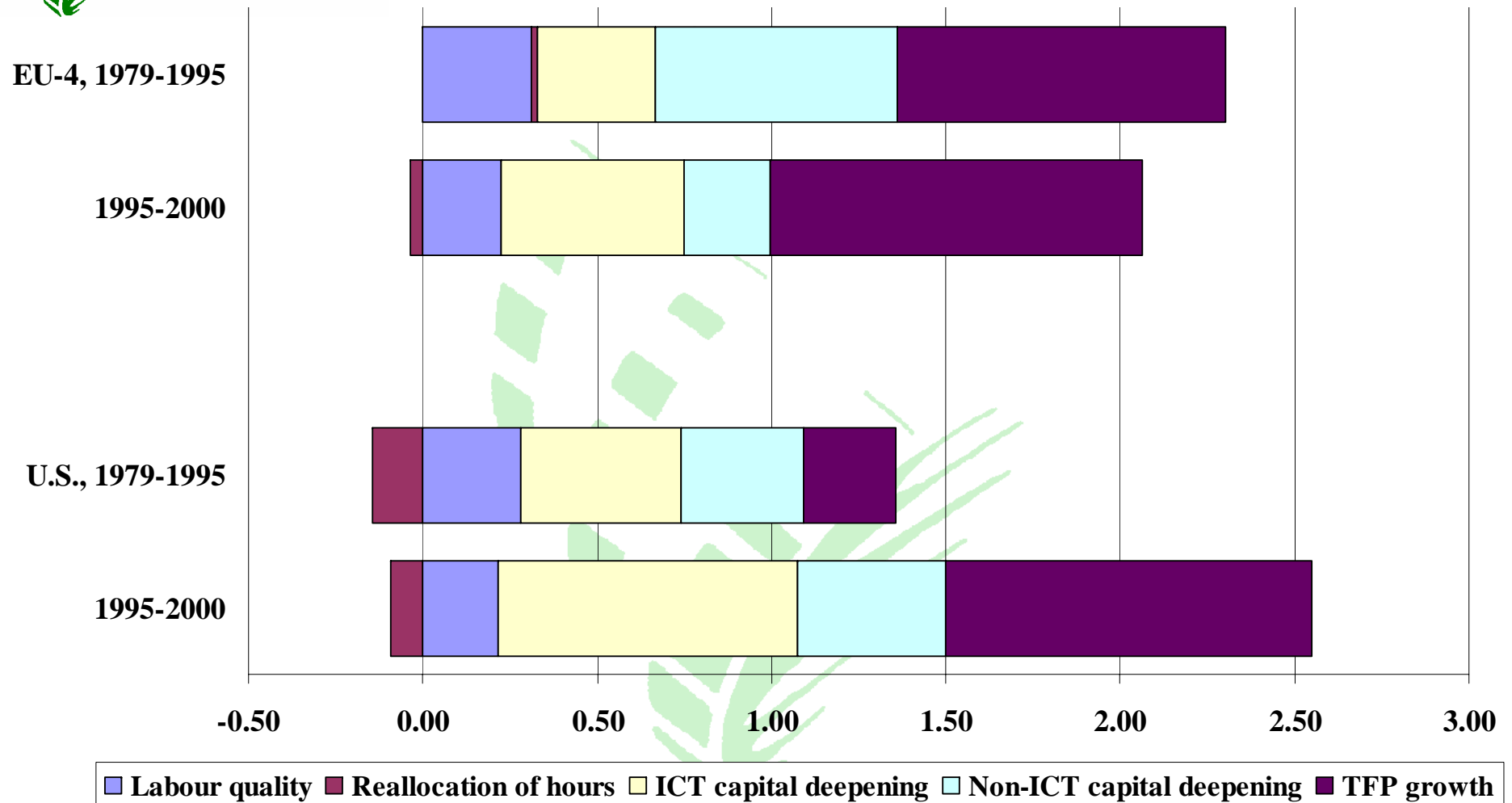


Data (3)

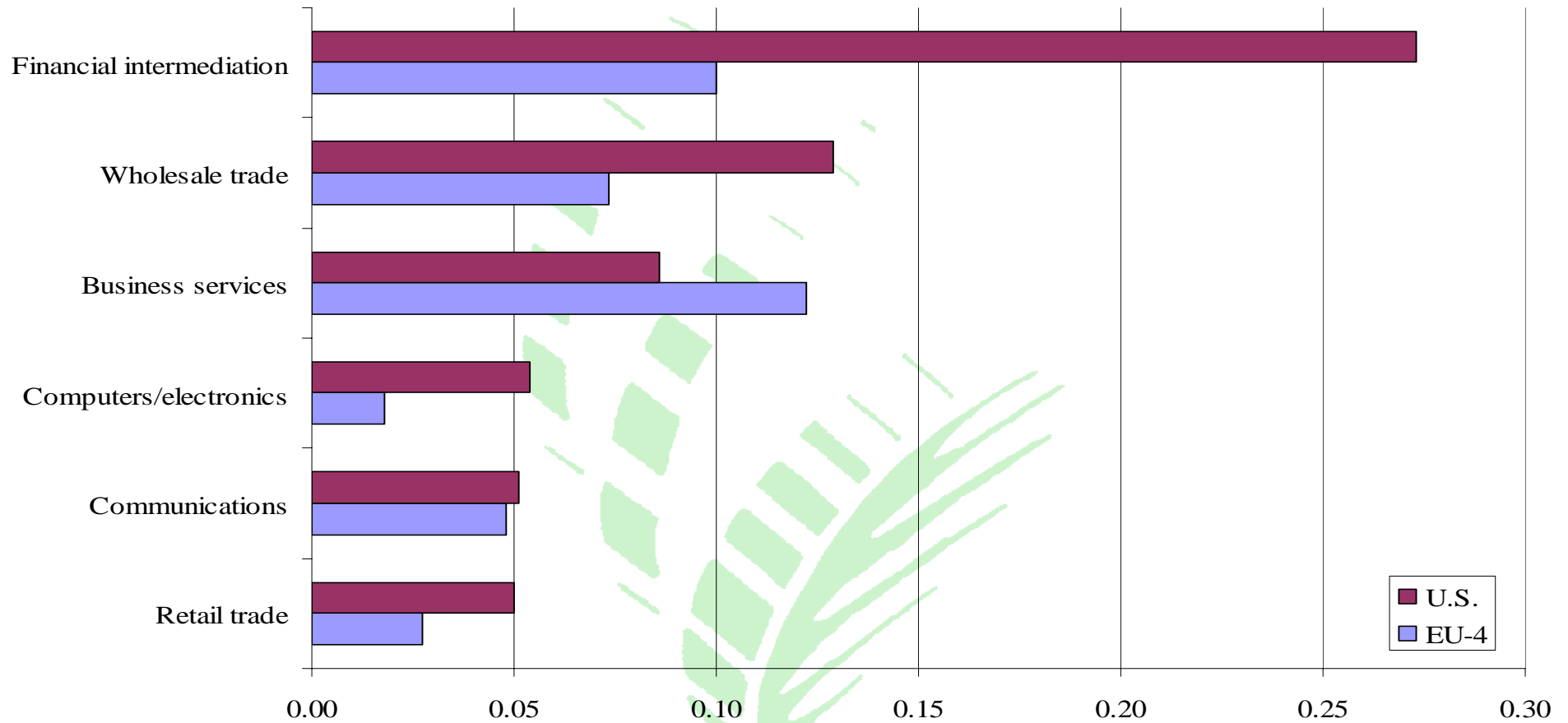
- Aggregation using Törnquist indices
- Aggregation across countries using industry-specific output PPPs
- No input/output tables yet => planned for FP6
- No adjustments for imperfect competition, input utilization



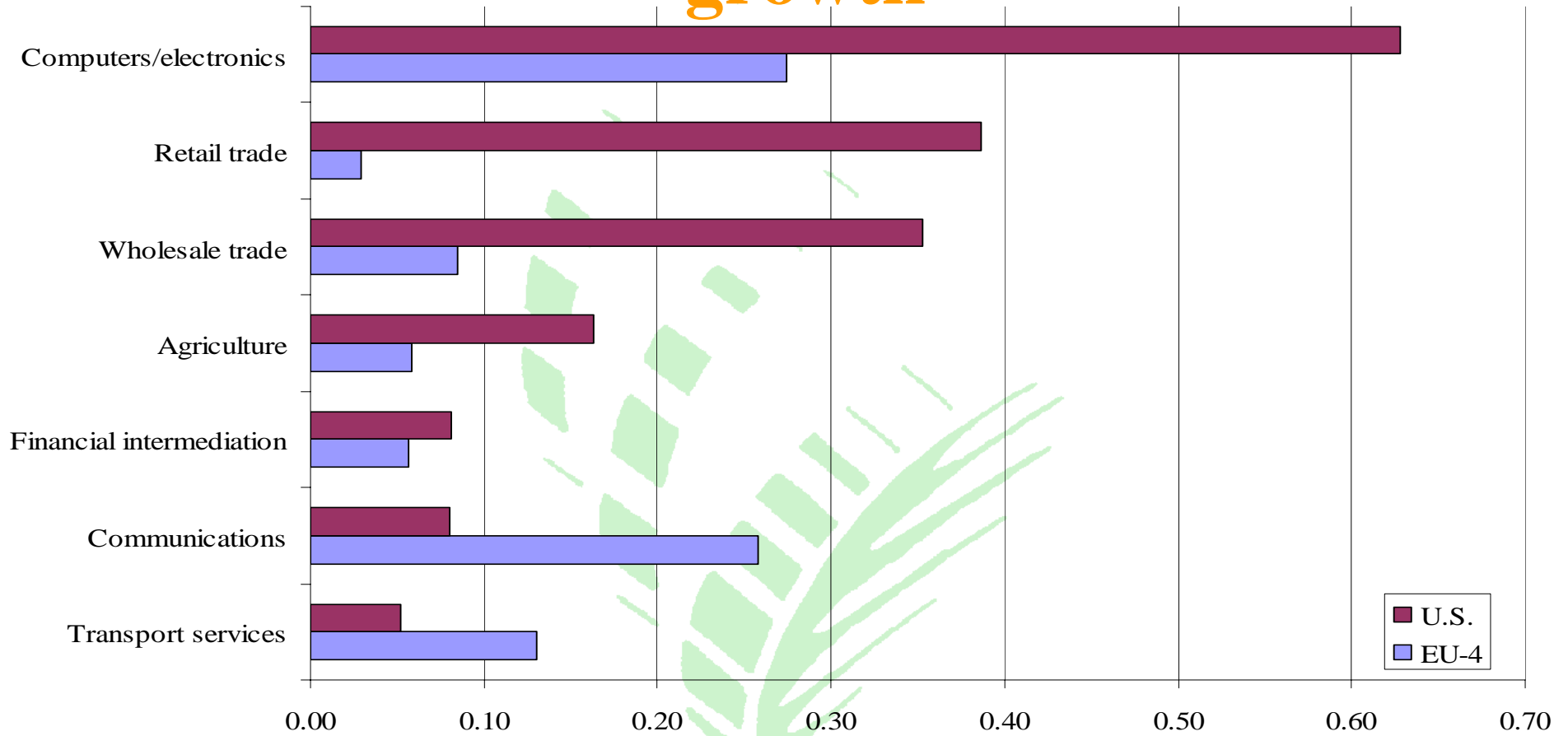
Sources of labour productivity growth



Industry Perspective (1): ICT contribution



Industry Perspective (2): TFP growth



Non-ICT investment and wage moderation (1)

	1979-1995	1995-2000	Difference
<i>Non-ICT capital deepening</i>			
EU-4	2.59	0.88	-1.71
U.S.	1.46	1.79	0.33
<i>Wage/non-ICT rental rate</i>			
EU-4	1.88	0.53	-1.35
U.S.	1.27	1.46	0.19

Non-ICT investment and wage moderation (2)

$$\dot{k}_{i,t}^N = \beta_1 \dot{w}_{i,t} + \beta_2 \dot{r}_{i,t}^N + v_i + \varepsilon_{i,t}$$

Non-ICT capital deepening Wage growth Non-ICT rental rate growth Industry dummies

		France	Germany	Netherlands	UK	US
Wage growth	β_1	0.302** (9.961)	0.460** (5.032)	0.550** (6.068)	0.425** (9.411)	0.582** (8.159)
Non-ICT rental rate growth	β_2	0.011 (0.685)	-0.081** (-3.450)	0.021 (0.648)	-0.008 (-0.854)	-0.124** (-5.636)



Conclusions

- Divergence in productivity growth after 1995 between EU and U.S.
- U.S. acceleration related to ICT => few industries very important
- EU slowdown related to slower non-ICT investment => very widespread
- Better data => FP6
- More analysis: factor demand, imperfect competition