



ICT, Innovation and Economic Growth in Transition Countries: *Findings from Estonia, Latvia, Lithuania, Poland, and the Russian Federation*

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Objective and purpose

The objective and purpose of this study is:

- To look beyond the ICT dynamics in terms of ICT investment and technological evolution
- To select firms in transition economies as the subject of analysis
- To build on existing research on the role and impact of ICT (e.g. OECD EBIP)

Four main research questions

1. What is the contribution of ICT utilisation to the economic performance of firms?
2. What is the contribution of ICT utilisation to innovation among firms?
3. What are the enablers, barriers and constraints for ICT utilisation at firm level?
4. What are the actions that the public authorities can take in order to enhance the pro-growth use of ICT by the business sector?

Methodology (1)

- Aiming to identify the impact of ICT at the firm level
- Dynamic (*report on ongoing trends*) and forward looking (*pro-active firms – results indicative of more generic future evolution*)
- Central part is an Electronic Business Survey (EBS):
 - ✓ collects data at firm level (3-year data)
 - ✓ explores productivity and performance impacts of ICT for this case
 - ✓ does not impose any a priori assumptions about how any particular technology investment and any particular productivity or performance outcome are linked
 - ✓ The question routine is set up such that firms enumerate the impacts of ICT within the business dynamics and within their own firm-supplier-customer context

Note: The EBS methodology was first applied in a mainly qualitative form by the OECD in 2001 and formed the basis for the Electronic Commerce Business Impacts Project (EBIP). This study included 217 case studies covering 20 industry sectors spread out among 11 participating countries (Canada, France, Italy, Korea, Mexico, the Netherlands, Norway, Spain, Sweden, and the UK). A fully quantitative iteration of the EBS methodology was then applied to a sample of 220 enterprises in four different sectors of the Belgian economy.

Methodology (2)

- Module A: What are the characteristics of the enterprise?
- Module B: Which ICT applications are available in the enterprise?
- Module C: To what effect are these ICT applications being used?
- Module D: How are applications being used in business processes?
- Module E: How does the usage relate to the business environment?
- Module F: The enterprise's political and regulatory environment?

Methodology (3)

- The relation between ICT take-up and:
 - Productivity, Competitiveness, Innovation
 - Innovation (product, process and relational innovation)
 - Business organisation and strategy
 - External factors (economic and regulatory conditions)

Methodology (4)

- Addresses complexity
 - Not ICT centric
 - Interrelations with other factors
 - Establishes causal relations
- Addresses additionality
 - Estimates the relative importance of ICT vis-a-vis other factors

Methodology (5)

Target group of the study

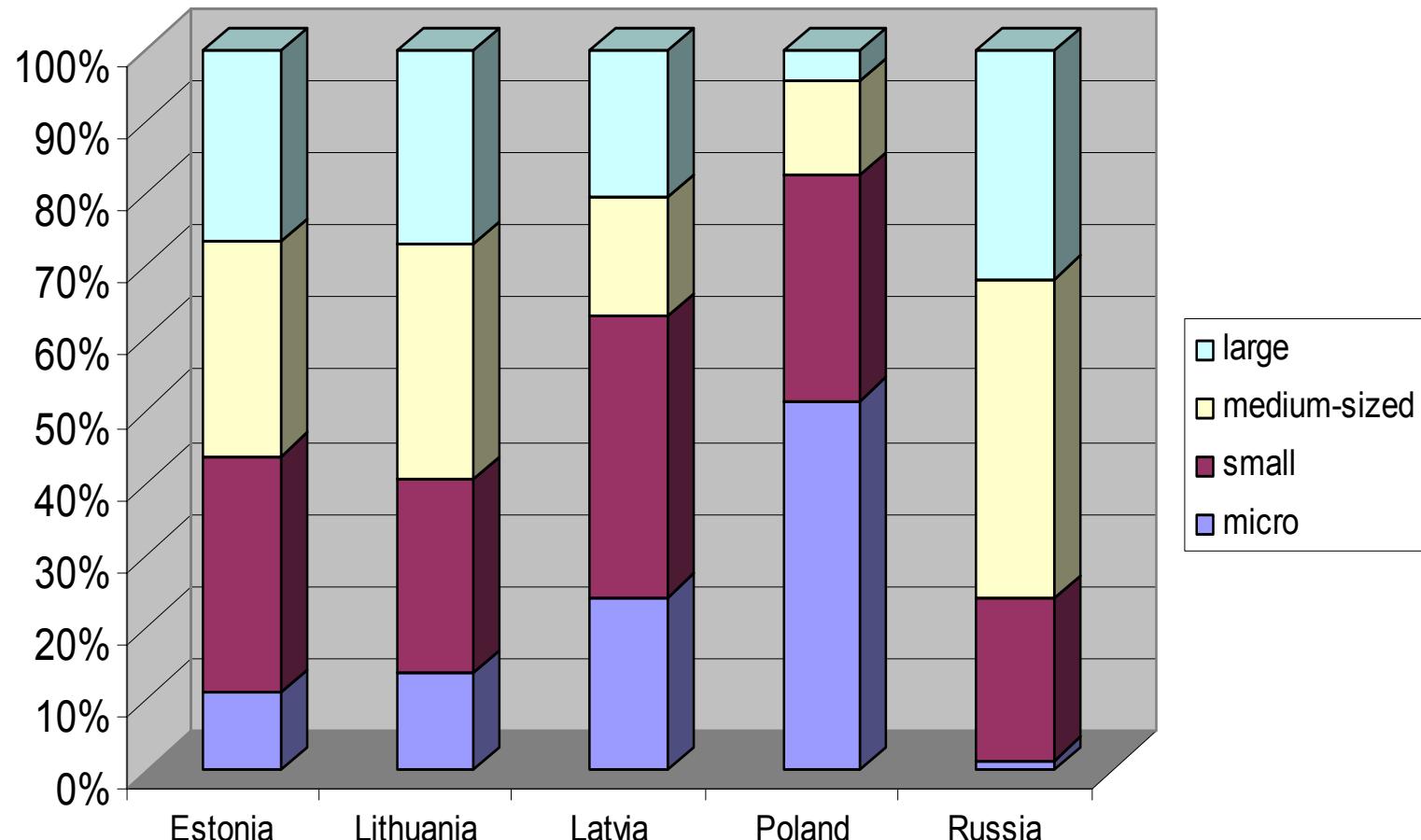
Countries: Baltic States (Estonia, Latvia,

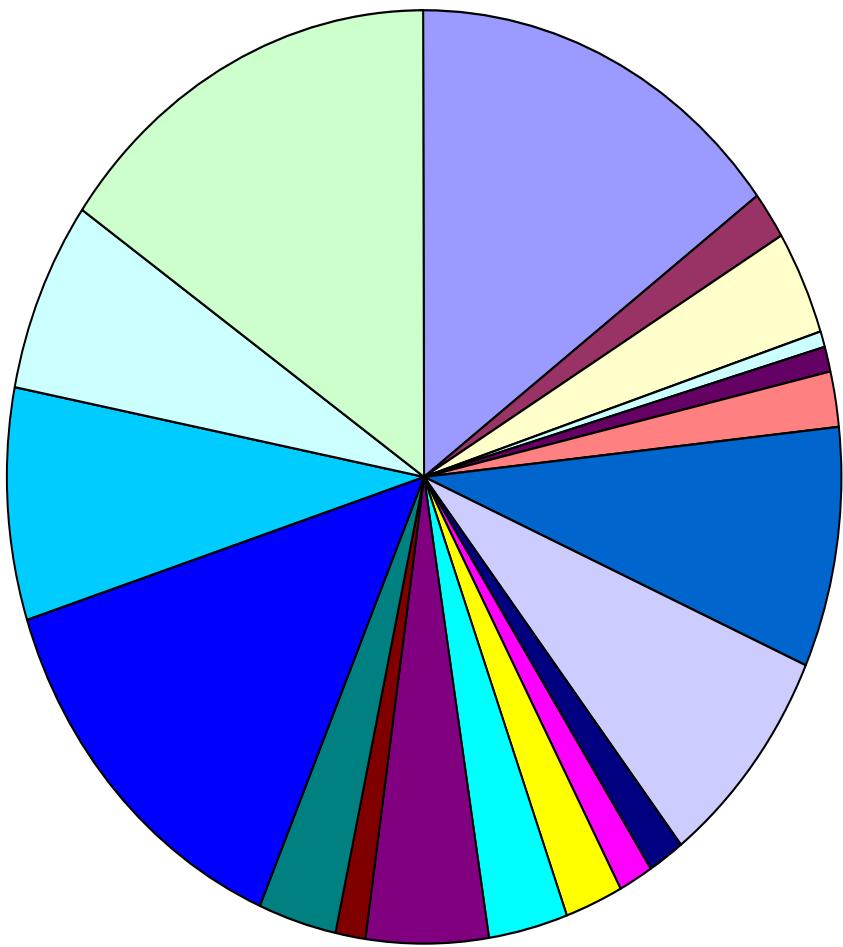
Lithuania), Poland (and regions), Russia
(and regions)

Sectors: 16 a.o. Finance, Food processing,
Furniture, Heavy machinery, ICT services,
Retail & wholesale

620 companies: large and SMEs

8 in depth case studies





- Food products and beverages
- Textiles and textile products
- Wood and wood products
- Pulp and paper products
- Publishing
- Chemicals
- Building materials
- Machinery
- Man. of computers
- Man. of electrical machinery
- Man. of motor vehicles
- Shipbuilding; repair)
- Furniture
- Construction (services)
- Sale, maintenance and repair of motor vehicles
- Retail trade
- Land transport
- Financial intermediation
- ICT services

Key findings Q1:

What is the contribution of ICT utilisation to the economic performance of firms?

ICT and its economic impact:

- ICT plays an important role in facilitating the modernisation and improved economic performance of firms
- ICT needs complementary factors in order to translate into improved economic performance
- Different dimensions of economic performance are affected differently (and require different complementary factors)

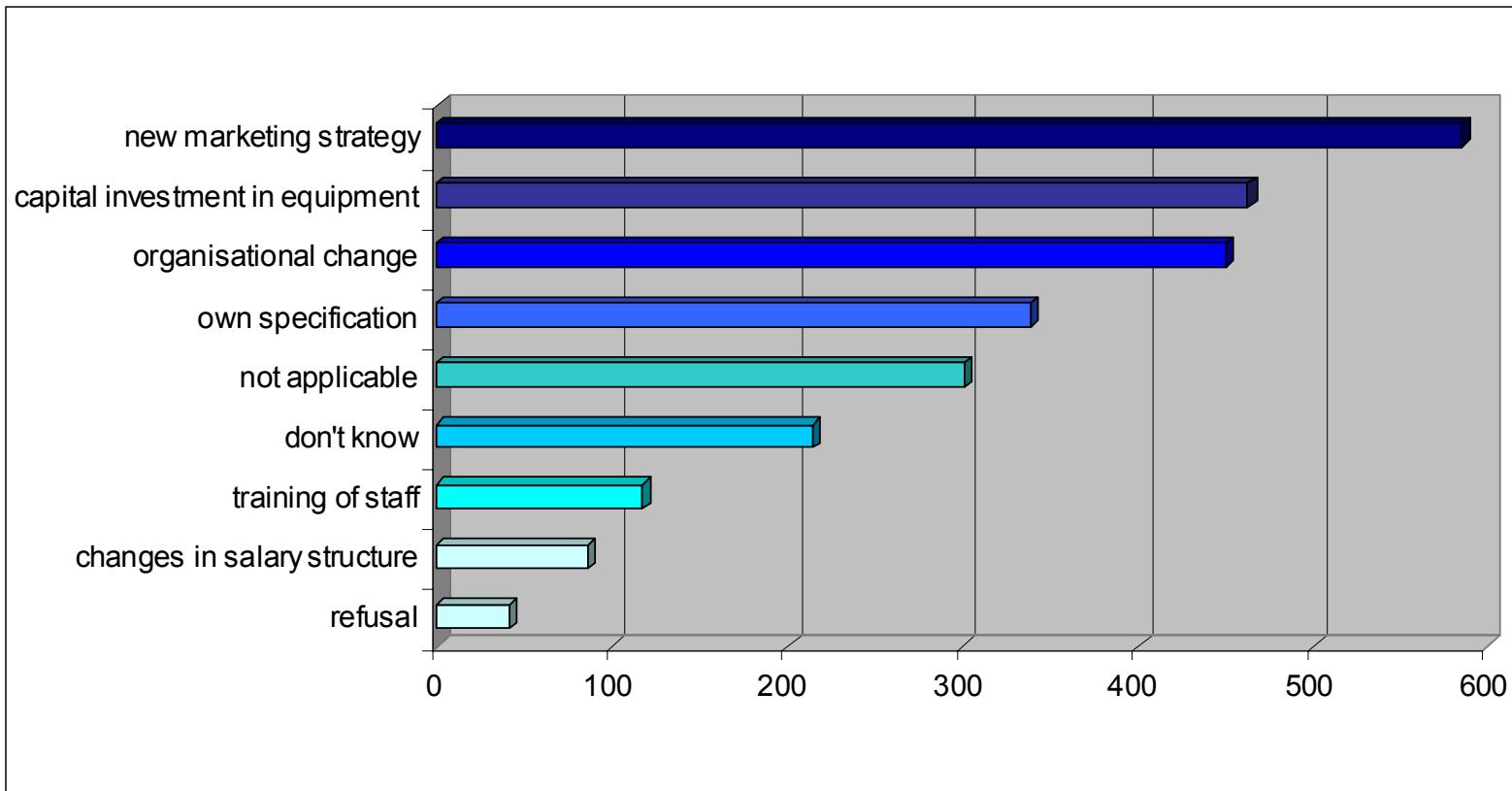
Key findings Q1:

What is the contribution of ICT utilisation to the economic performance of firms?

- Access to Internet – universal (99% of all firms)
- Local area networks – popular (74%)
- However:
 - Less advances ICT rather than latest generations
 - Dependent on country's technical infrastructure
- ICT usage geared towards serving customers and markets:
 - High priority on purchasing and procurement and marketing and sales (50%)
- 30% of firms say ICT usage itself generates increases in ICT investment (self-sustaining process)

Key findings Q1:

Factors reinforcing the positive effect of ICT in companies



Performance indicators	Most mentioned factor	2nd most mentioned factor	3rd most mentioned
Labour productivity	Organisational change	Investment in equipment	Training of staff
Operational costs	Investment in equipment	Organisational change	Changes in salary structure
Revenue from sales	Investment in equipment	Organisational change	Training of staff
Profitability	New marketing strategy	Investment in equipment	Organisational change
Investment in innovation	Investment in equipment	New marketing strategy	Organisational change
ICT investment	Investment in equipment	New marketing strategy	Organisational change
Price competition	New marketing strategy	Organisational change	-
Quality Competition	New marketing strategy	Organisational change	Investment in equipment

Factors reinforcing the positive effect of ICT in companies – comparison with other studies

1. Close correlation between organisational change and greater labour productivity, lower operational costs and increasing revenues
2. Effective utilisation of ICT requires:
 - more horizontal structures
 - greater levels of responsibility
 - Clearer functional description of tasks
 - Large firms emphasise on productivity and profitability
 - SMEs – on revenues and costs reduction

Factors reinforcing the positive effect of ICT in companies – sectoral differences

Strong correlation between the “information intensity” of the product/service and increase of performance through ICT

Sector	Contribution of ICT to economic performance
Finance	High
Food Processing	Low
Furniture	Low
Heavy Machinery	High
ICT services	High
Retail & wholesale	Medium

Factors reinforcing the positive effect of ICT in companies – countries' differences

	% of firms with reported increase in labour productivity	% of firms with reported reduction in operational costs	% of firms with reported increase in revenues	% of firms with reported increase in profitability
Estonia	58 (64)	18 (67)	58 (45)	40 (56)
Poland	38 (42)	15 (42)	34 (21)	28 (18)
Russia	41 (76)	24 (72)	63 (56)	43 (80)

The figure in brackets is the % of firms who reported increase/decrease who attributed this change mainly to ICT or ICT and other factors

Key findings Q2:

What is the contribution of ICT utilisation to innovation among firms?

- ICT in itself is only a limited facilitator of innovation (requires complementary factors, e.g. organisational change, new marketing strategies etc.)
- ICT is mainly contributing to process innovation, rather than product and relational innovation (contrast with Western Europe)
- Sectoral differences in role of ICT for innovation suggests that information intensity of production and transaction processes is an important determinant

Process Innovation	% experiencing increase/improvement	% led to improvement in costs	% mainly ICT	% ICT and other
Speed and Reliability	68	31	38	47
Automation of tasks	59	50	38	43
Information Management	75	41	46	38
Organisational Change	63	43	10	69

Product innovation	% undertaking product innovation	% led to improvement in sales	% mainly ICT	% ICT and other
New products and services	61	73	9	43
Customisation	54	48	9	46
Bundling	35	69	13	43

Relational innovation	% experiencing improvement/increase	% mainly ICT	% ICT and other
Amount of customers	61	0	3
Value of sales/customer	45	7	41
Share of retained customers	47	7	42
Value of sales per retained customer	44	6	40
Number of suppliers	40	6	44
Value of purchases per supplier	43	3	35
Number of repeat suppliers	26	5	36

What is the contribution of ICT utilisation to innovation among firms?

Process innovation

- *Positive relationship between ICT use, improved speed and reliability of business processes and cost reduction*
 - *Organisational change, new marketing strategy and capital investment are the complimentary factors*
-

Product innovation

- *Product innovation contributed much to revenue increase*
 - *Product innovation: mainly customisation and product bundling*
 - *However, the contribution of ICT – limited*
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Relational innovation

- *ICT – more important for suppliers' relationship rather than for customers'*
- *Effects: changes in sales value/customer; greater share of retained customers*
- *Effects: change in number of suppliers; value of purchase/supplier; more repeat suppliers; value of purchase/repeat supplier*

Key findings Q3:

What are the enablers, barriers and constraints for ICT utilisation at firm level?

Enablers, barriers and constraints:

- Telecommunication prices and quality of services are not seen as major barriers (*Caution*: study is focused on advanced firms; could be indicative of improvements from liberalising telecom. markets)
- Inadequate education and training, and inappropriate tax and fiscal policies are major barriers
- Intellectual property rights and regulation – major inhibitor especially in Russia

Key findings Q3:

What are the enablers, barriers and constraints for ICT utilisation at firm level?

Country specific findings:

Estonia: Leads among the sample, but needs better training programmes and protection of IP rights

Latvia: Insufficient public financial support for R&D and inadequate public training programmes

Lithuania: Needs to improve public financial support for R&D and improve training

Poland: Inappropriate taxation measures and inadequate public financial support for R&D. Needs better training programmes.

Russia: Inadequate commercial law, inappropriate taxation measures and insufficient public financial support for R&D. Needs better training programmes.

Key findings Q4:

Six policy recommendations

1. Encouraging greater take-up and utilisation of ICT in the private sector: *improve tax and financial incentives, education and training*
2. Encouraging greater adoption of ICT in the public sector: *e-public services, e-identity, promotion Open Source Software*
3. Promoting internet security and trust: *civil and criminal framework, more actions on spam, stimulate trust e-marks*
4. Supporting research and innovation: *strengthening IP rights, R&D investment, innovative networks, ensure engagement of SMEs in innovation, tax and fiscal incentives*
5. Strengthening competition: *remove constraints on rolling out new applications, liberalisation of telecommunication market*
6. Skills and the labour market: *training, e-business, awareness*

Recommendations for firms

- The introduction of ICT needs to be well prepared and fit with the overall business strategy
- ICT needs to be complemented with a range of factors (e.g. Organisational change)
- Use ICT for product innovation

Thank you!

<http://www.infodev.org/en/Publication.553.html>

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