



**ITU-UNESCAP-APT Capacity Building Workshop
Information Society Statistics: Core ICT Indicators
Bangkok, 6-8 November 2007**

Measuring ICT impact at the firm level

*Dr. Susan Teltscher
Chief, ICT Policy and Analysis Unit
ICT and E-Business Branch, SITE
UNCTAD*

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT



Measuring economic impact of ICT

Three approaches to examine link between ICTs and growth:

1. ICT producing sector
2. ICT investments (all industries)
3. ICT use by firms



Measuring economic impact of ICT

For literature review, see UNCTAD Information Economy Report 2007/08 Chapter 3





Measuring ICT impact – firm level


- **ICT access** – telephones, computers, Internet, other devices
- **ICT use** – Activities carried out over the Internet, use of computers, mobile phones, networks
- **ICT impact – which indicators?**
 - ✓ Measurable impact indicators cannot be collected from responses to questionnaires, have to be computed for quantifying impact
 - ✓ Questionnaires: only perception measures

Key variables for measuring ICT impact on labour productivity

Labour productivity	ICT variables	Complementary control variables
<ul style="list-style-type: none"> • Sales per employee • Gross output per employee • Value added per employee • Or recalculations of the above variables based on effective hours worked by employees 	<p>Binary (dummy) variables: take on value 1 if firm has access to a specific technology and 0 otherwise.</p> <p>Numerical variables:</p> <ul style="list-style-type: none"> • Spending on specific ICTs • ICT capital stock • Share of employees using ICTs • Number of computers available in the firm 	<ul style="list-style-type: none"> • Firm age • Ownership • Affiliation to a multi-unit firm • Skill mix (share of employees working directly in production) • Level of education • Industry sector of activity • Geographical region • Factors of Cobb-Douglas production functions (ordinary capital stock, employment, cost of materials)

The impact of ICT on labour productivity in OECD countries (at the firm level)

- Similar technologies impact differently on firms in different markets - a 10% increase in the share of employees using computers results in:
 - 1.8% higher labour productivity in manufacturing and 2.8% in services in Finland (*Maliranta & Rouvinen, 2003*)
 - 1.3% higher labour productivity in the entire business sector in Sweden (*Hagén & Zeed, 2005*)
 - 2.1% higher labour productivity in manufacturing and 1.5% in services in the UK (*Farooqui, 2005*)



Measuring impact of ICT at firm level – data considerations

- Stand-alone ICT survey: need information on business performance, economic variables
- Business survey: include a module on e-business – possible to link data on economic performance (turnover, labour, investment)
- Linking surveys (EU project)

Joint UNCTAD – Thailand NSO Project

Objectives



- To study the impact of ICT use in firms on labour productivity in a developing country setting using official statistics
- To assist the Thai NSO building capacity in the analysis of ICT statistics using econometric techniques

Joint UNCTAD – Thailand NSO Project

Activities and timeline



- *January 2007:* UNCTAD training on applying econometric techniques to ICT data analysis (1 week), to NSO staff in Bangkok
- *March – October 2007:* Data analysis UNCTAD and Thai NSO (in parallel), using SPSS and e-Views; assistance via long distance (email)
- *October – November 2007:* Drafting of final report; results will also be published in UNCTAD Information Economy Report 2007/08 (January 2008)

Joint UNCTAD – Thailand NSO Project

Methodology and results



- Will be presented by Thailand NSO

Thank you

susan.teltscher@unctad.org
measuring-ict.unctad.org
www.unctad.org/ecommerce