UOC Universitat Oberta de Catalunya

From e-Readiness to e-Awareness. Design of and evidence from a comprehensive model of the Digital Economy

Ismael Peña-López

IPID ICT4D PG/PhD symposium 2008

University of Joensuu

Mekrijärvi , September 9th, 2008

Index

Why should access (to ICTs) be fostered?

- **A literature review**

What do we mean by access?

- **A literature review**

How has been access measured and why measurements do or do not work?

- **A qualitative analysis**

Why are there different digital development models and what can be done to foster access?

- **A quantitative analysis**

Why should access be fostered?

Why should access be fostered?

Evidence (http://ictlogy.net/?p=677) shows:

- **Positive impact on sociability and personal relationships (communication)**
- **Positive impact on the (macro)economy, e.g. growth**
- **Positive impact on the (micro)economy, e.g. productivity**
- **Impact on employment, culture (positive and negative)**

→ New opportunities, new divides

What do we mean by access?

What do we mean by access?

Two (main) models (and a half):

Telecommunications model:

- **Capability to send one's message – THE EMITTER**

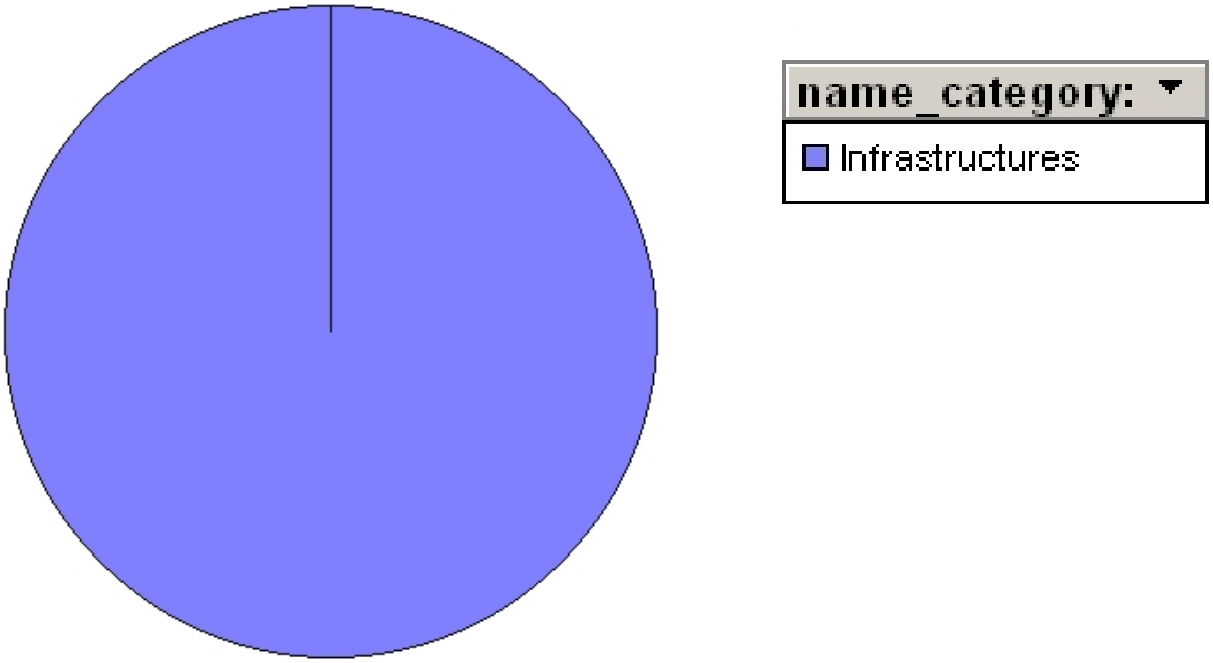
Broadcasting model:

- **Range of products on offer – THE RECEIVER**

Conduits model:

- **The ability/capacity of effective usage**

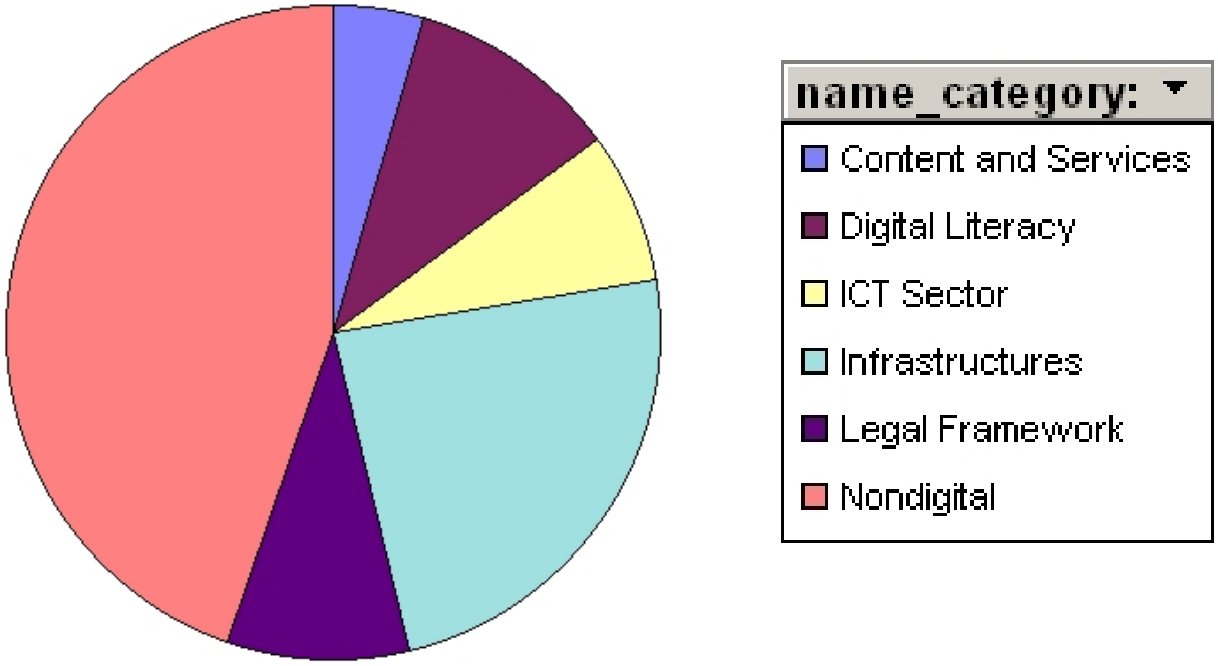
The Telecom approach



ICTs ? Development ✓

Policies ? ICTs ✗

The e-Readiness approach



ICTs ? Development ✗

Policies ? ICTs ✓

How has been access measured and why measurements do or do not work?

Qualitative Analysis

Models that describe the Digital Economy

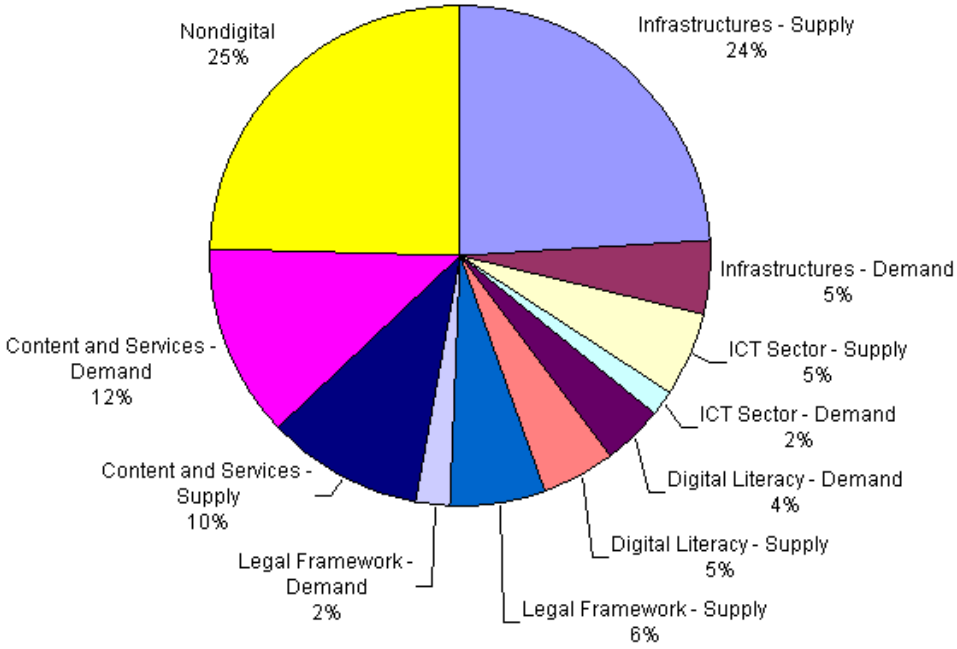
1. **What has been the evolution of the models of the Digital Economy? (Q1)**
2. **What are the main strengths and weaknesses of such models? (Q2)**
3. **Can we draw a comprehensive model of the Digital Economy?**

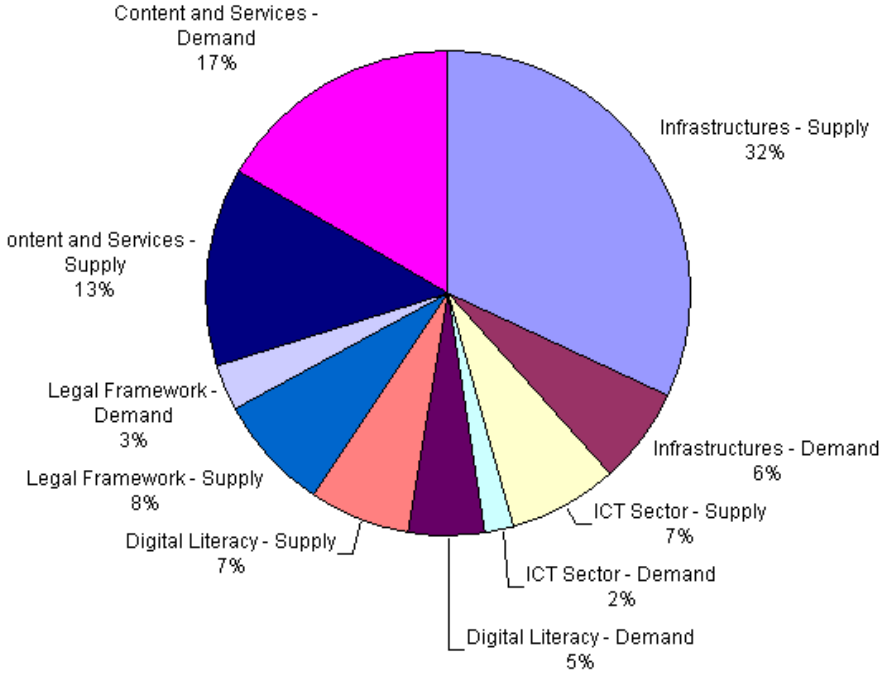
Models analyzed

- **Theoretical**
- **One time assessments**
- **Indices**
- **Data Sets**

- **49 models**
- **1489 indicators**

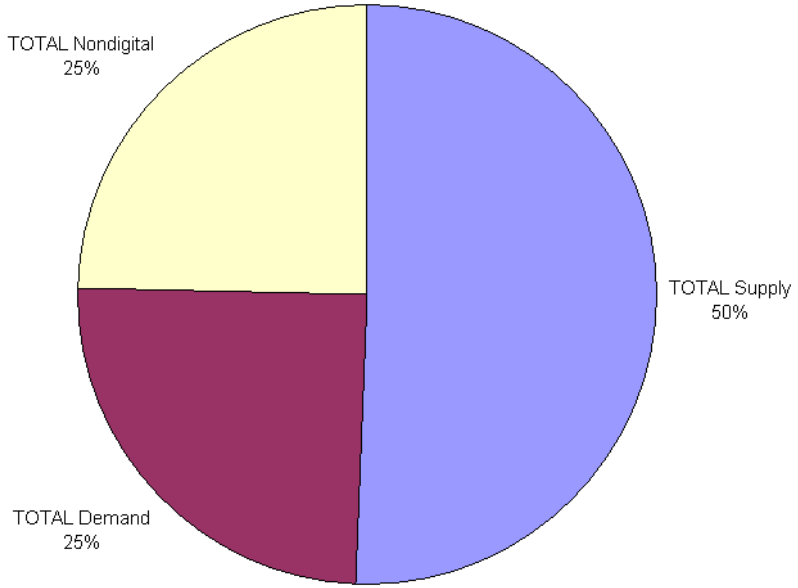
Qualitative Analysis

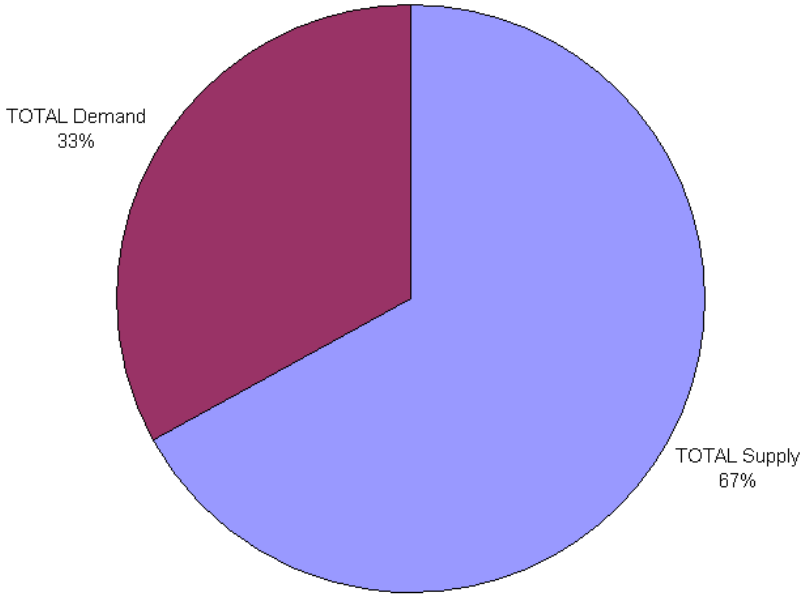




- **Lack of available indicators, analyses difficult to be made**
- **Tiny concern about the affordability of infrastructures**
- **Role of the ICT Sector is, in our opinion, underrepresented**
- **Little effort is put to measure the digital capacity**
- **Few existing indicators measure both the regulation of the information Society**

Qualitative Analysis

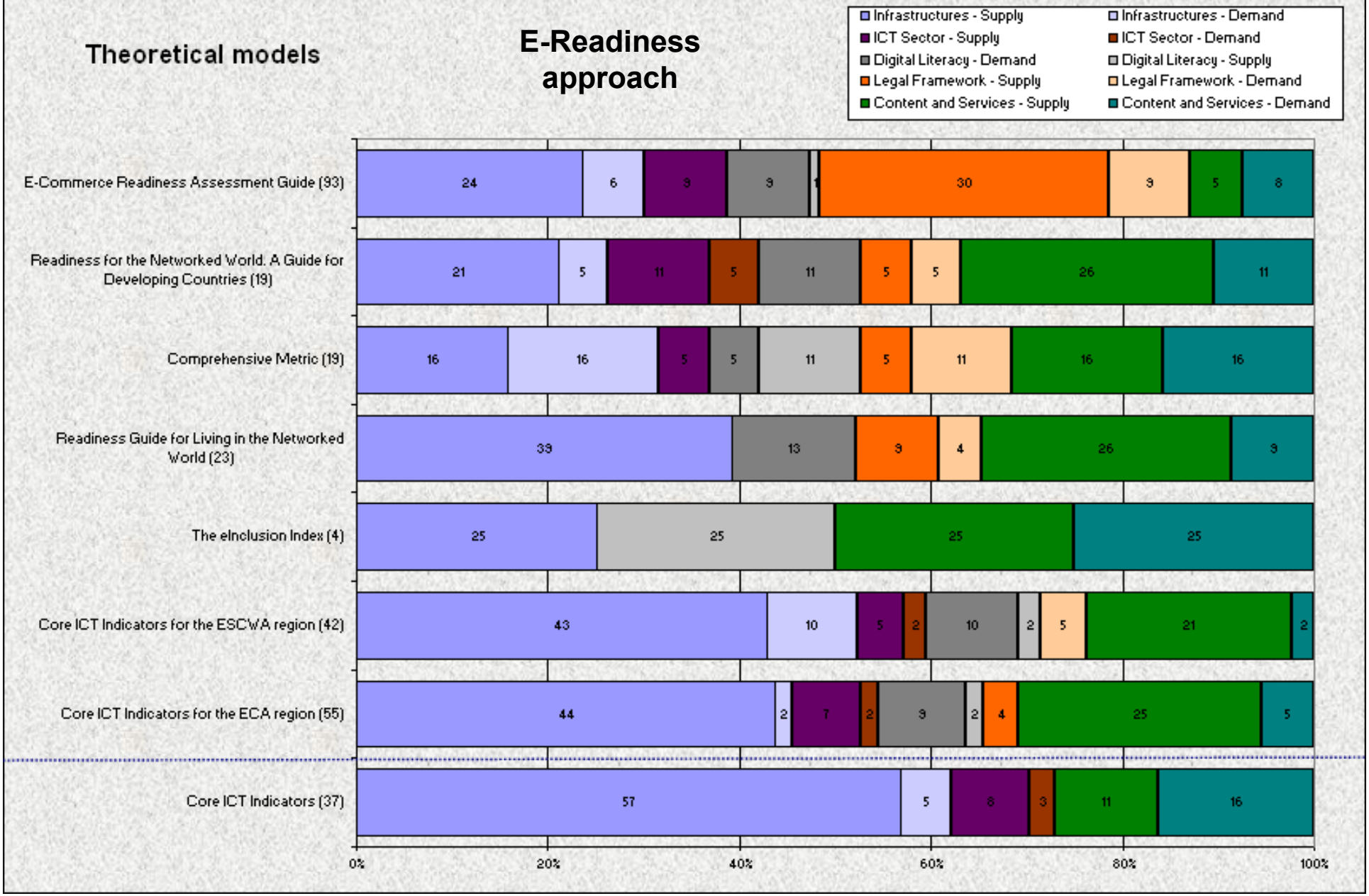




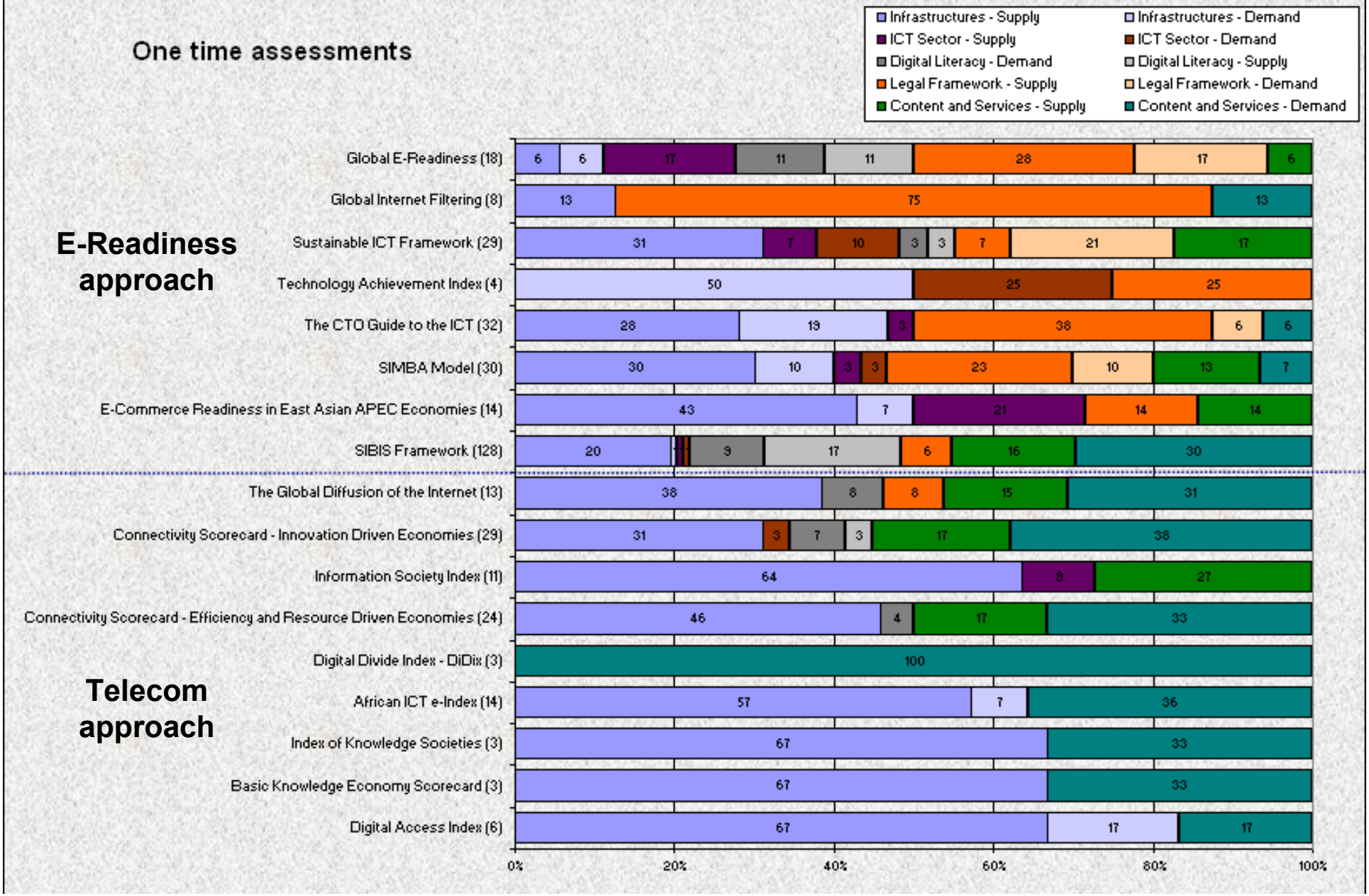
- **Absolute predominance of supply side indicators**

Theoretical models

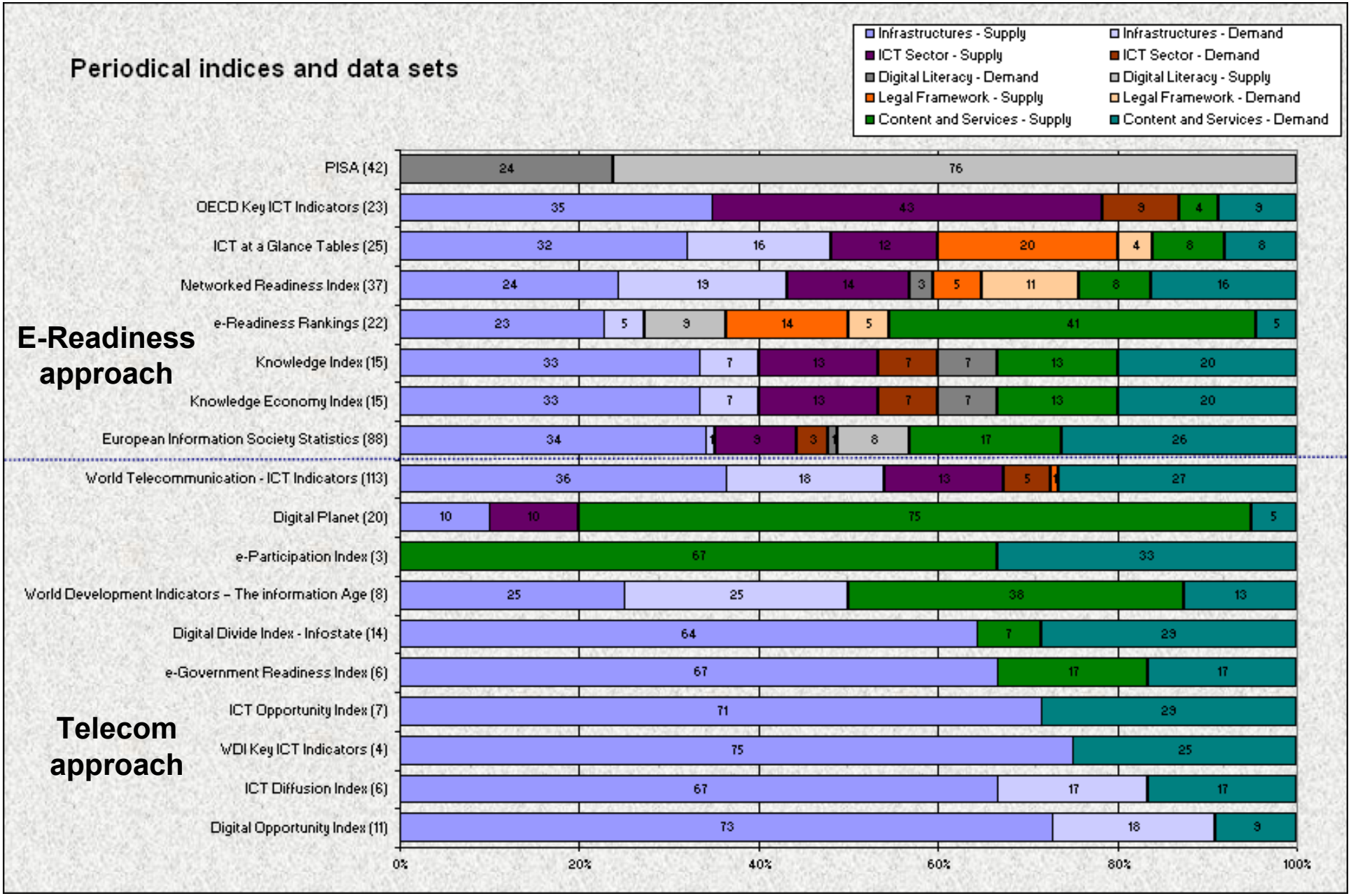
E-Readiness approach



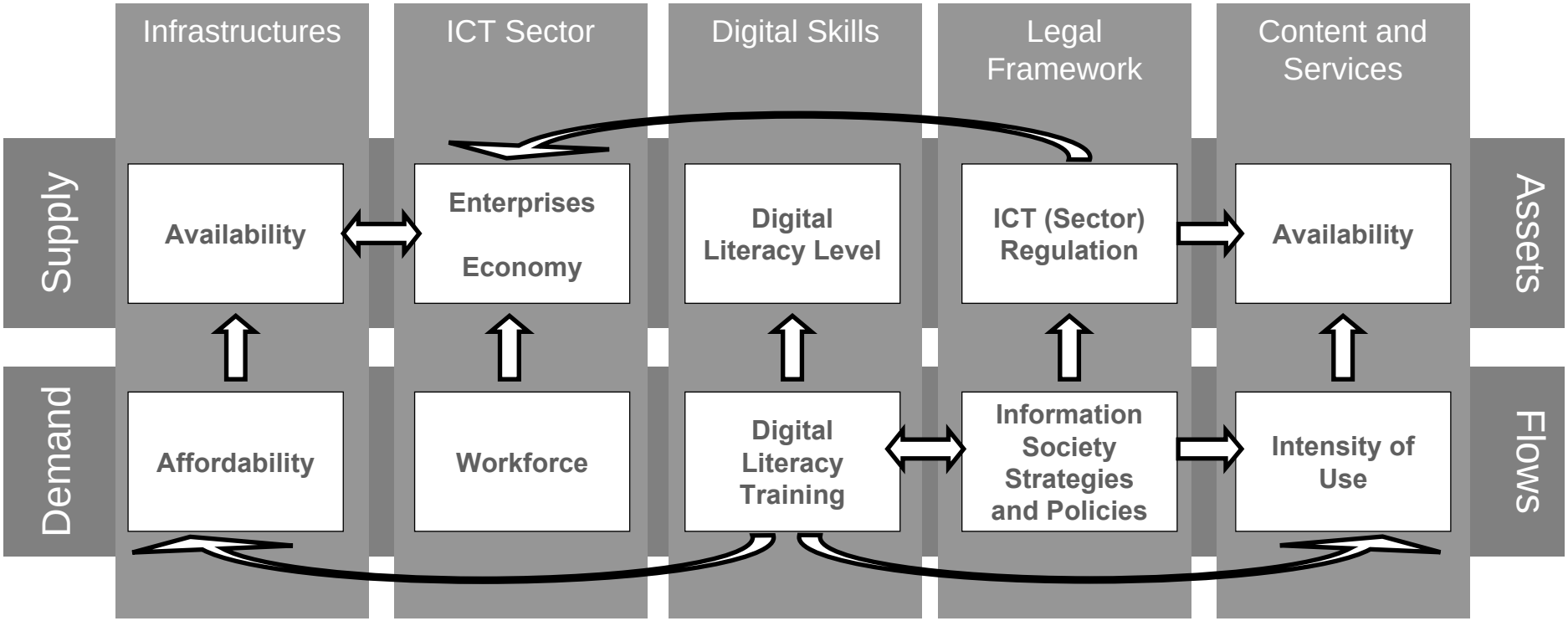
One time assessments



Periodical indices and data sets



Towards a Comprehensive Model



Why are there different digital development models and what can be done to foster access?

Quantitative Analysis

1. **There are several stages of evolution of a country's Digital Economy (H3)**

2. **The main reasons for the development of a Digital Economy are analogue variables (e.g. Education, Health) (H3)**

3. **But digital literacy has little to do with literacy/education in general and it is not an "extension" or another stage of literacy/education (H3)**

Quantitative Analysis

1. Selection of indicators
2. Selection of a subset of indicators
3. Cluster analysis
4. Characterization
5. Determinants and regressions

Quantitative Analysis: only digital variables

First set of indicators (247 countries)

	Infrastructures	ICT Sector	Digital Literacy	Legal Framework	Content and Services
Supply	12	7	7	14	6
Demand	10	5	2	4	12

Second set of indicators (75 countries)

	Infrastructures	ICT Sector	Digital Literacy	Legal Framework	Content and Services
Supply	6	2	1	2	3
Demand	1	1	1	1	5

Quantitative Analysis: correlation analysis

BIG problem

- **Highly significant correlation amongst almost all digital variables**

BIG reflection (conclusion?)

- **Changes in digital variables cannot be explained *within* the digital economy (i.e. by *only* changing other *digital* variables)** (needs testing)
- **Is (digital economy based) leapfrogging a mirage? (i.e. ICTs as multiplicators or catalysts, but not development locomotives)** (needs testing)

Quantitative Analysis: cluster analysis

(relative weights)	1	2	3
INF_S_01 - Broadband subscribers (per 100 people)	39,1%	8,5%	**52,4%**
INF_S_02 - Personal computers (per 100 people)	41,7%	7,4%	**50,9%**
INF_S_03 - Telephone mainlines (per 100 people)	39,8%	14,7%	**45,4%**
INF_S_05 - Mobile phone subscribers (per 100 people)	37,0%	23,3%	**39,6%**
INF_S_07 - International Internet bandwidth (bits per person)	36,8%	7,0%	**56,2%**
INF_S_09 - Internet Hosts (per 10000 people)	**52,3%**	3,8%	43,9%
INF_D_09 - Price basket for residential fixed line (US$ per montl	34,5%	15,5%	**50,1%**
ICTSECTOR_S_01 - Telecommunications revenue (% GDP)	32,8%	**42,4%**	24,8%
ICTSECTOR_S_03 - Computer, communications and other servi	35,8%	24,6%	**39,7%**
ICTSECTOR_D_06 - GDP per Telecom Employee (US Dollars)	36,3%	6,7%	**57,1%**
DIGLIT_S_07 - Human Capital	34,5%	30,4%	**35,1%**
DIGLIT_D_02 - Internet Access in Schools	36,5%	26,0%	**37,5%**
LEGAL_S_01 - Laws relating to ICT	35,6%	27,1%	**37,3%**
LEGAL_S_02 - Intellectual property protection	36,6%	24,7%	**38,7%**
LEGAL_D_03 - Gov't procurement of advanced tech products	34,9%	29,5%	**35,6%**
USE_S_01 - Secure Internet servers (per 1 million people)	40,8%	2,0%	**57,2%**
USE_S_02 - Total Domains (per 100 people)	**53,2%**	3,7%	43,1%
USE_S_06 - Availability of government online services	34,3%	27,4%	**38,3%**
USE_D_07 - Internet users (per 100 people)	40,0%	14,6%	**45,4%**
USE_D_09 - Total ICT Spending, Consumer (% of GDP)	30,4%	**44,9%**	24,7%
USE_D_10 - Firm-level technology absorption	34,4%	29,3%	**36,3%**
USE_D_11 - Extent of business Internet use	35,0%	28,1%	**36,9%**
USE_D_12 - ICT use and government efficiency	34,0%	29,9%	**36,0%**

Quantitative Analysis: development stages

3. Digital Leaders: Strong infrastructures, pervasive penetration, intensive government and business usage.

Ireland, Norway, Switzerland

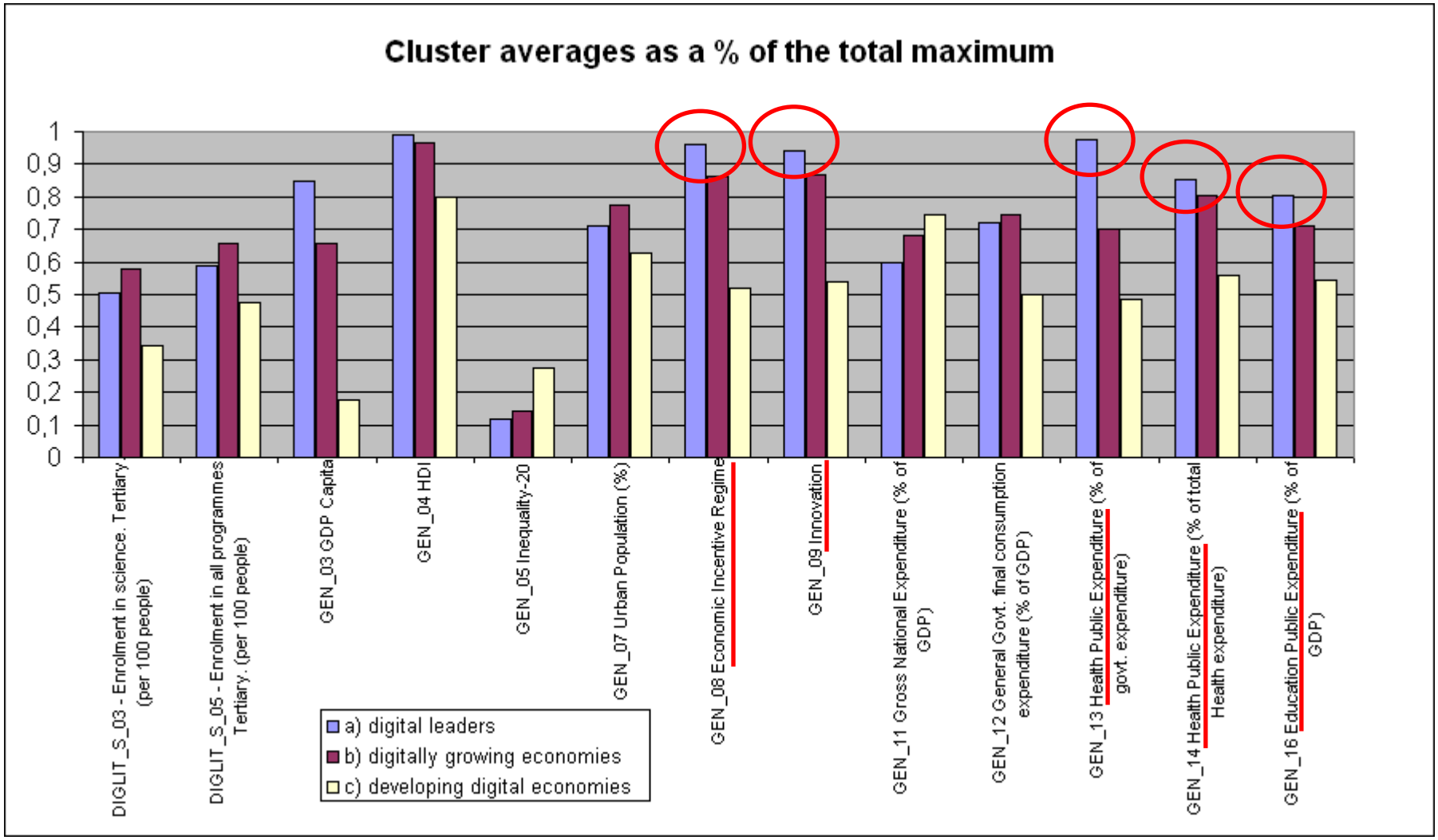
1. Digitally Growing Economies: Infrastructures and legal framework set. Growing use, but lack of better infrastructures and content and services. Businesses lead digital development.

Australia, Austria, Finland, France, Germany, Greece, Italy, Japan, New Zealand, Saudi Arabia, Singapore, Spain, Sweden, United Kingdom, United States

2. Developing Digital Economies: Huge expenditure and inversion in ICTs, a former stage towards a higher usage. Just installing the digital economy.

Argentina, Bolivia, Brazil, Bulgaria, Chile, Ecuador, Egypt, Hungary, India, Jordan, Korea (Rep.), Mexico, Pakistan, Panama, Peru, Philippines, Portugal, Romania, South Africa, Sri Lanka, Thailand, Tunisia, Uruguay

Quantitative Analysis: cluster analysis



Quantitative Analysis: development stages

Regressions

Digital Development Stage (cluster) = α + β Characterization Variables + ε
Model significant, coefficients non significant (needs reworking)

Broadband = α + β Several combinations of Characterization Variables + ε
Models significant, some coefficients significant (needs reworking)

R&D in the ICT Sector = α + β Several combinations of Charac. Variables + ε
Models significant, some coefficients significant (needs reworking)

→ conclusion!?

Quantitative Analysis: digital literacy

Correlation between LiveJournal users and FaceBook users
And significant

LiveJournal users = α + β Human Capital + ε
Model non significant, coefficients non significant

LiveJournal users = α + β Internet at Schools + ε
Model non significant, coefficients non significant

FaceBook users = α + β Human Capital + ε
Model non significant, coefficients non significant

FaceBook users = α + β Internet at Schools + ε
Model non significant, coefficients non significant

→ **reflection: is writing a blog or taking part in SNSs digital literacy? YES?**

→ **reflection: can digital literacy be proxied by level of education? NO?**

Next work

Dichotomize some variables (e.g. high, low) and repeat tests.

More determinants / regressions to reassure some first findings.

Draw conclusions and advice for policy-makers and decision-takers.

UOC Universitat Oberta de Catalunya

Mekrijärvi, September 9th, 2008. Joensuu University

To cite this work:

Peña-López, I. (2008) *From e-Readiness to e-Awareness. Design of and evidence from a comprehensive model of the Digital Economy* (on-line presentation)
<http://ictlogy.net/presentations/20080909_ismael_pena_from_e-readiness_to_e-awareness.pdf>

To contact the author:
http://ismael.ictlogy.net/

All the information in this document under a
Creative Commons license:
Attribution – Non Commercial – No Derivs

More information please visit
http://creativecommons.org/licenses/by-nc-nd/2.5/