

Introducing ICT Industries for Urban & Economic Growth of Large Cities in Developing Countries :

Mumbai and Chittagong





1 Background

Development Potential



POPULATION



LAND



ENERGY

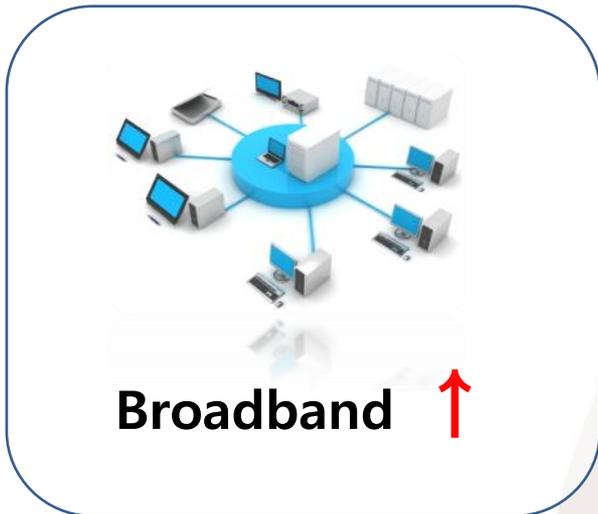


Human Capital

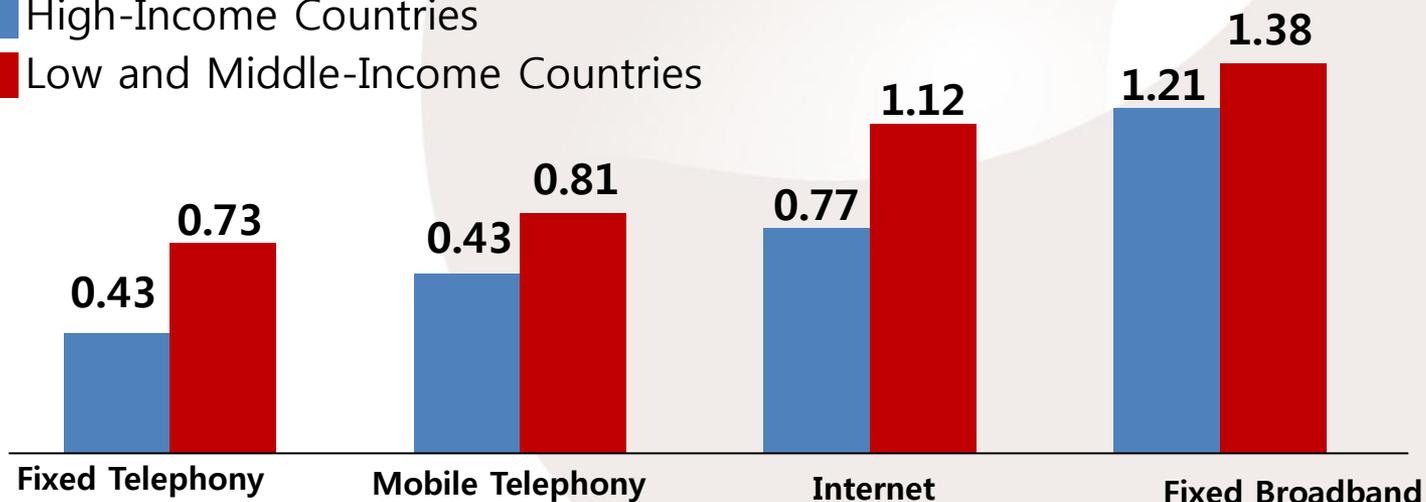


**Information and
Communication
Technology**

ICT Impact on Economic Development



■ High-Income Countries
■ Low and Middle-Income Countries

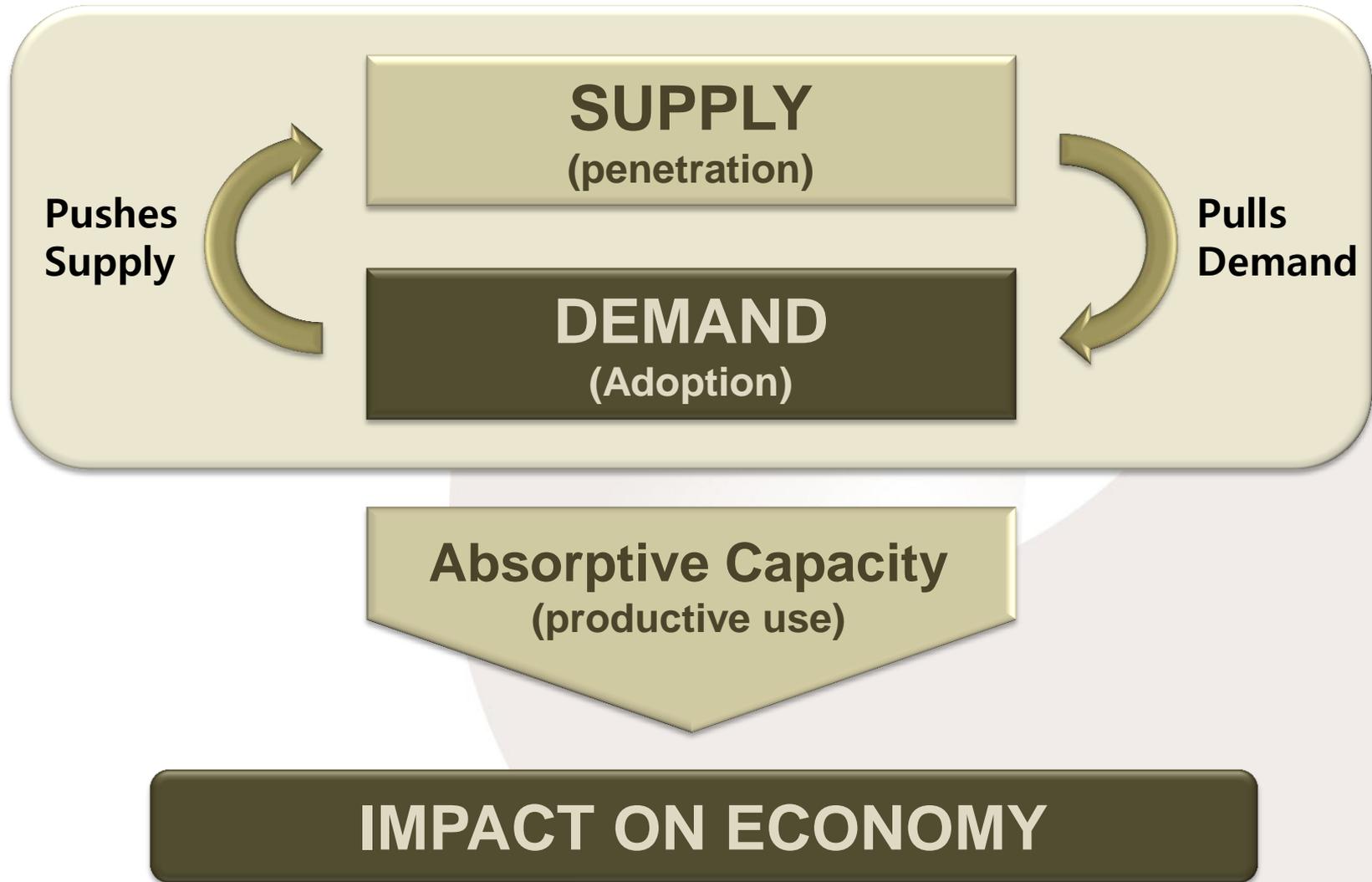


Source: Building Broadband : Strategies and Policies for the developing world, World Bank

Growth impact of telecommunications

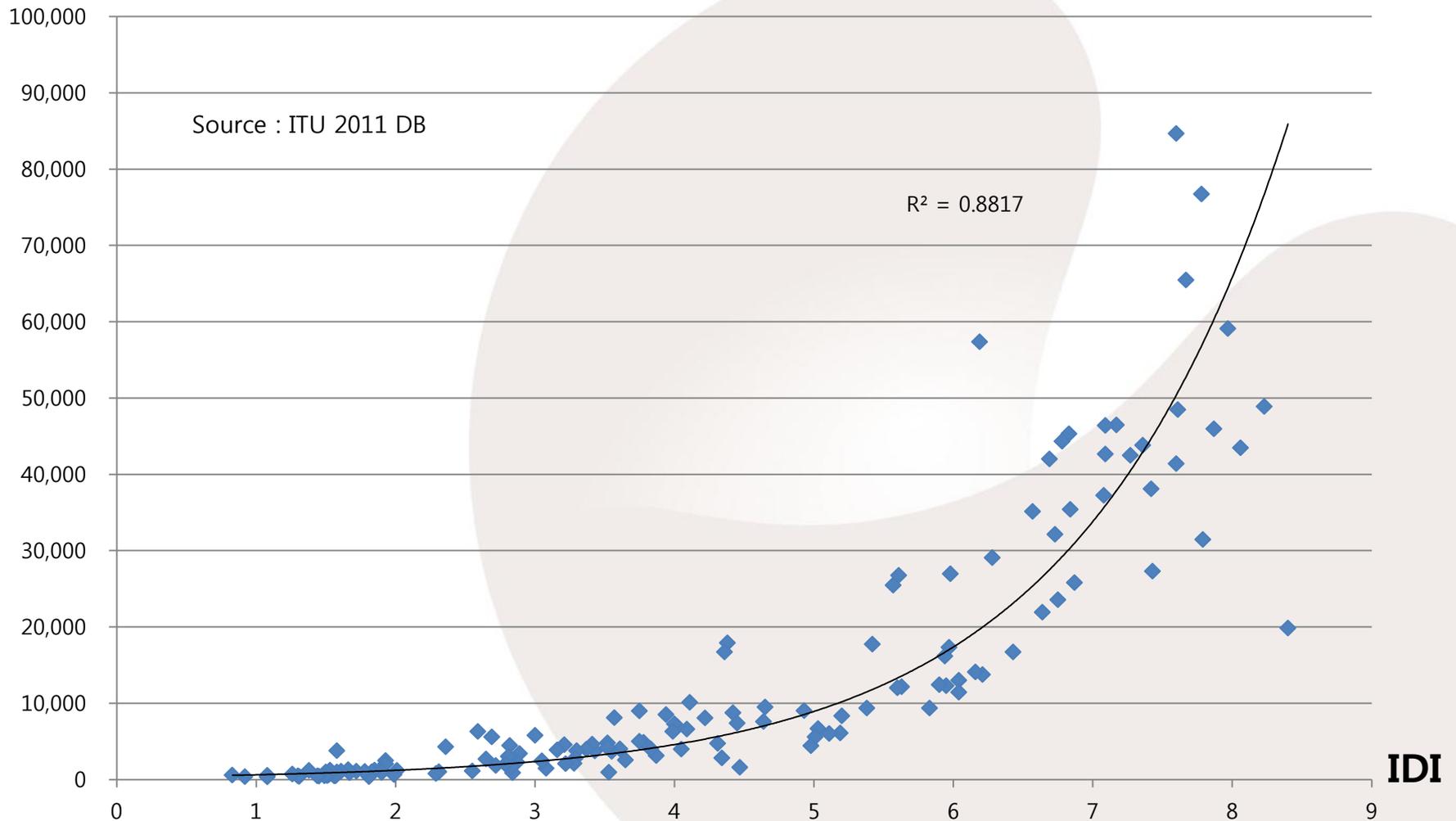
GDP percentage point increase due to 10% increase in broadband penetration

➤ ICT Eco-System



➤ The relationship between GNI and IDI

Gross National Income





2 Objectives



Objectives

1) A three dimensional ICT toolkit development

current ICT status on a global scale

regional economic characteristics

ICT development potentials

2) Applying ICT toolkit to the pilot cities

ICT status analysis of Mumbai and Chittagong

specialization ratio analysis of Mumbai and Chittagong

selection of promising ICT industries and benchmark cities

3) Policy recommendations and action plans

comparison between benchmark cities and the pilot cities

policy recommendations

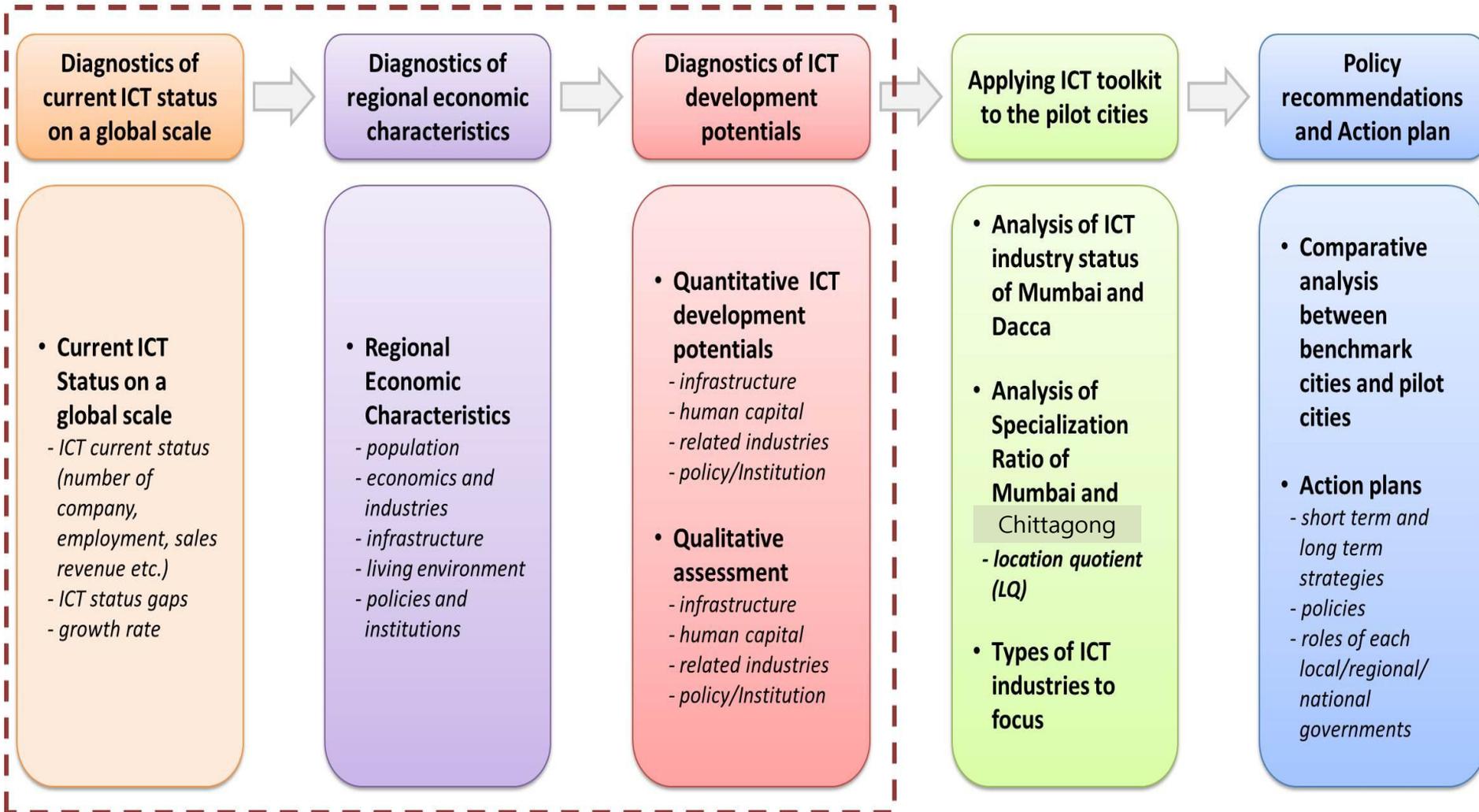
action plans



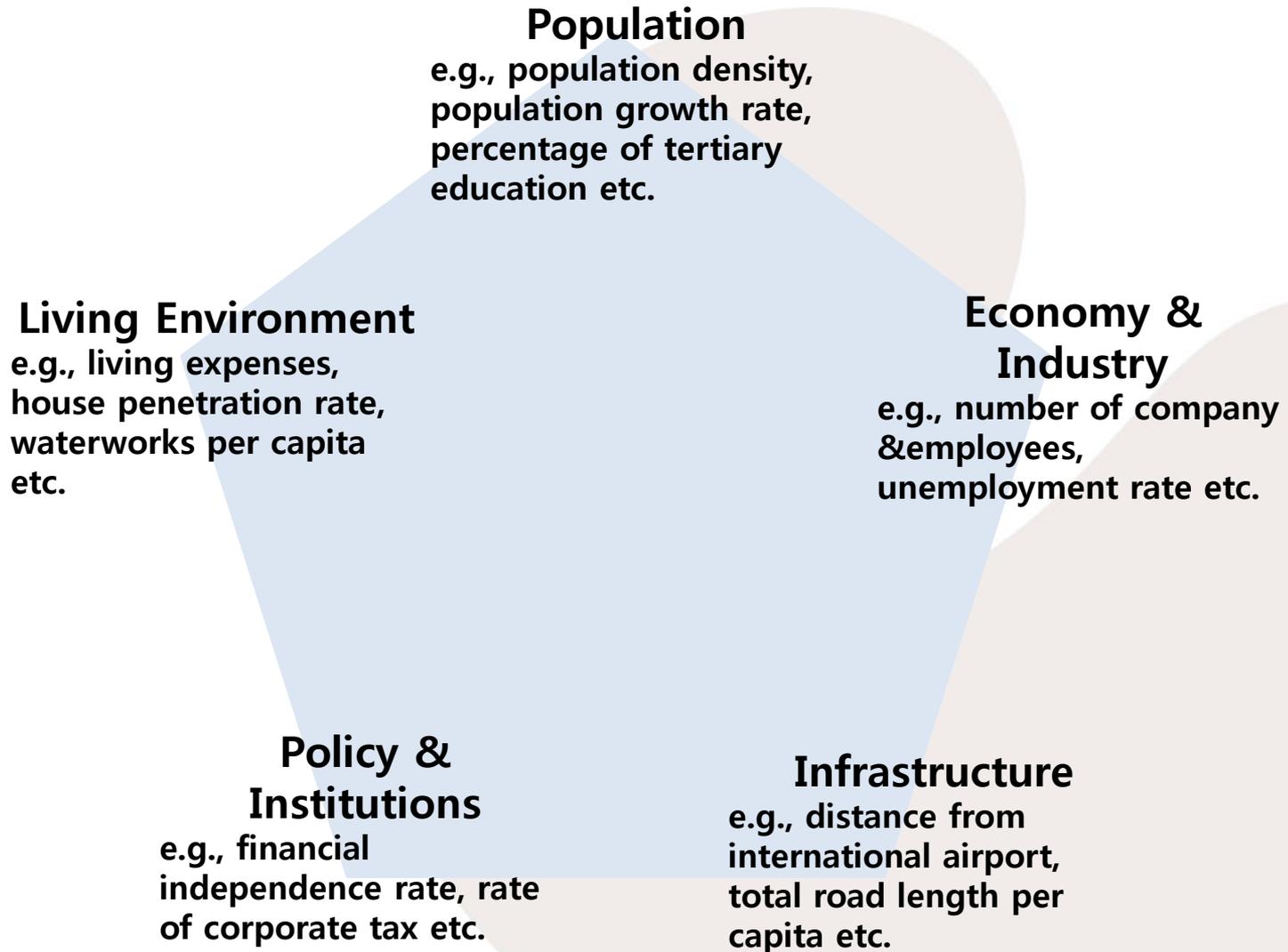
3 Analytical Approach

Research Framework

ICT Toolkit



➤ Five Pillars of Regional Economy



➤ Diagnostics of ICT Development Potentials

Quantitative

- Infrastructure (See Table 1)
- Human Capital (See Table 2)
- Related Industries (See Table 3)
- Policy and Institution (See Table 4)

Qualitative (Interview)

- Infrastructure
- Human Capital
- Related Industries
- Policy and Institution
(See Table 5)

➤ Quantitative Indices of Infrastructure (Table 1)

Component Index	Sub-indices
Business	Websites per 1,000 people
	Secure Internet servers/million pop.
	Extent of business internet use
	Call centers
Internet	Int'l Internet bandwidth per 100 people
	Internet users per 10,000
	Households w/ internet access, %
	Cost of Internet Access
	Broadband internet subscriptions per 100 people
PC	Households w/ personal computer, %
	Computers per 100 students
	Computers per 1,000 people
Telecom	Use of virtual social networks
	Telephones per 100 people
	Mobile phones subscribers per 1,000 pop.
	Charge of Mobile Phone per month

➤ Quantitative Indices of Human Capital (Table 2)

Component Index	Sub-indices
Level of education	Tertiary education gross enrollment rate, %
Environment In labor market	Average entry level salaries
	Percentage of occupations related to computer
Availability of Human resources	Talent: Cost, Wage rate
Scale of human capital	IT & ITES Graduates
	Percentages of graduates that are women
	Computer skill population per 100 people
	English speaking population
	Secondary education gross enrollment rate, %

➤ Quantitative Indices of Related Industries (Table 3)

Component Index	Sub-indices
Industrial Environment	Knowledge-intensive jobs, % workforce
Industries' scale	The number of IT and ITES firms
	IT/ITES GRDP as % of total services GRDP
	IT/ITES employees
	Added value scale of IT & ITES
	Added value ratio of IT & ITES
Competitiveness	Ratio of IT & ITES export amount to total amount
	Ratio of IT & ITES import amount to export amount
	Export amount of IT & ITES
R&D investment and level	Researchers of University and Research Institutes
	Added value compared to private R&D of IT & ITES
	Average growth rate of private R&D in IT & ITES area
	IT & ITES patents, applications per 10,000 people

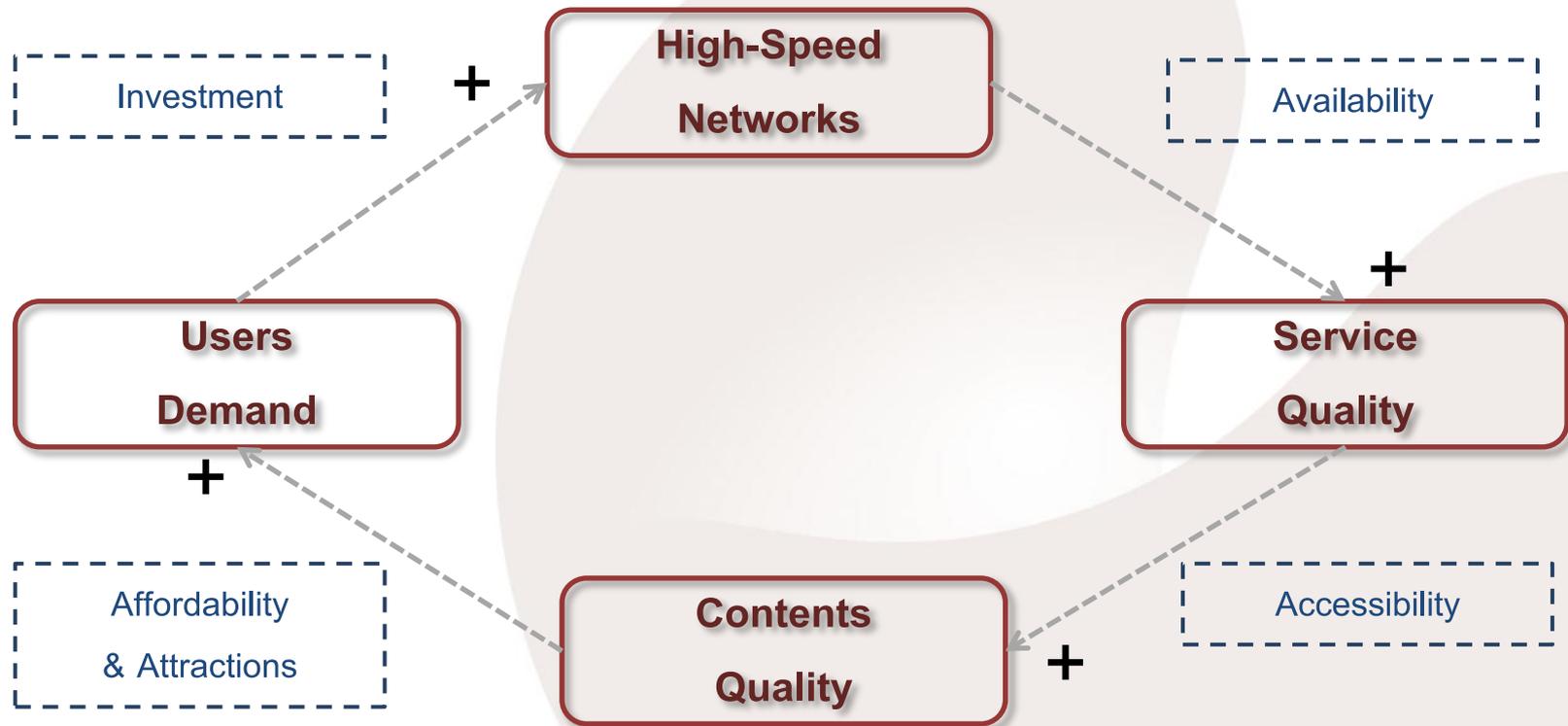
➤ Quantitative Indices of Policy and Institution (Table 4)

Component Index	Sub-indices
Financing environment	Possibility of getting loan with ideas
	Venture capital availability: GDP compared to venture Capital size
	GDP compared to asset scale of financial sector
Institutional environment	Total tax rate, % profits
Business environment	Starting a business Time (days)
	Starting a business cost(% of income per capita)
	Intellectual property protection, Illegal reproduction rate of software
	Closing a business Time (years)
	Closing a business Cost (% of estate)

➤ Qualitative Indices For Interview Survey (Table 5)

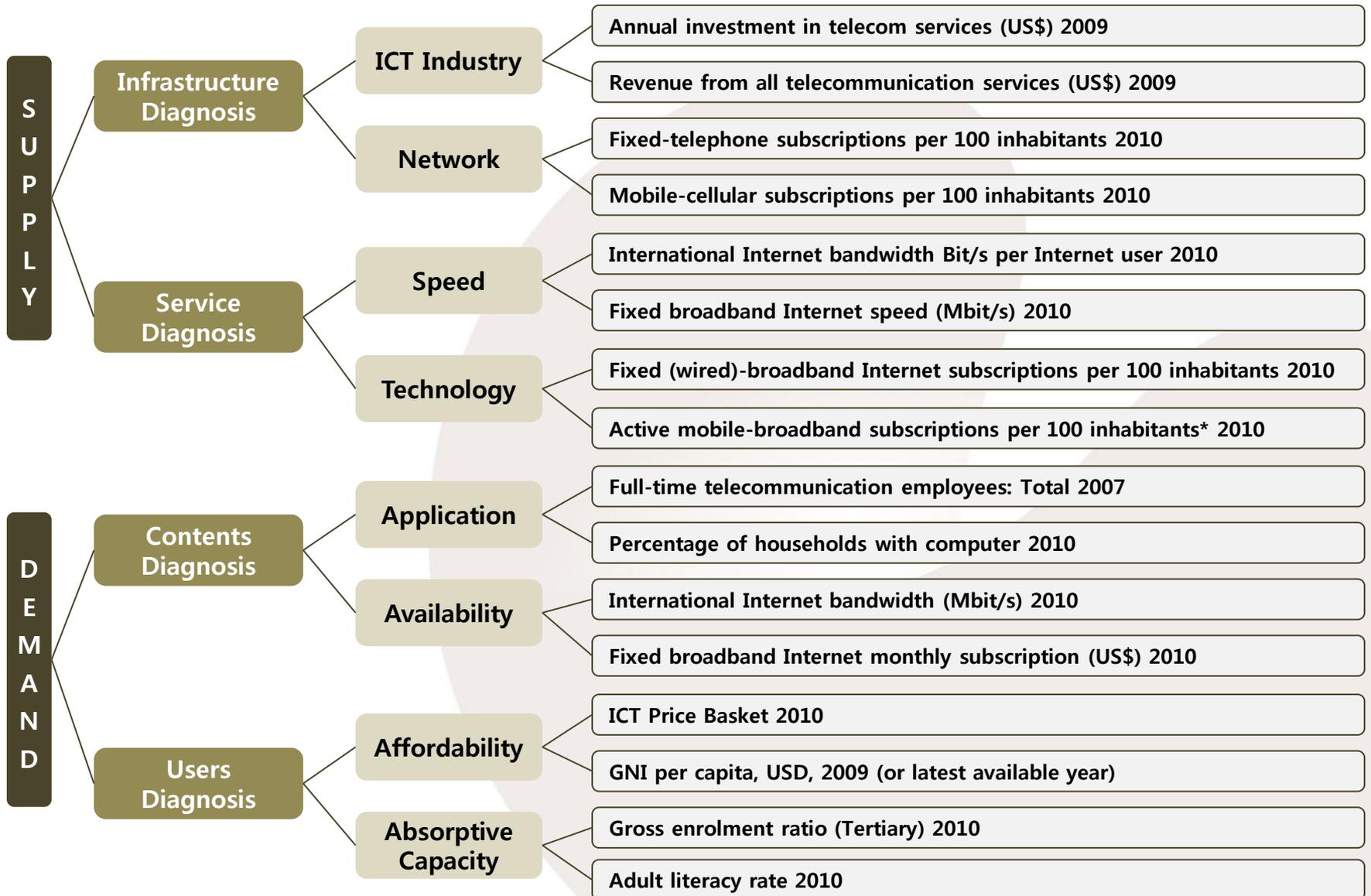
Index	Component Index	Sub-Indices
Infrastructure	Business	Internet Connectivity
	Telecom	Quality of Telecommunication and Network Service
Human Capital	Level of Education	Quality of Educational System
		Public Interest in Science and Technology
		Grade in Science of 2nd year of Middle School
	Environment in Labor Market	Grade in Math of 2nd year of Middle School
		Entrepreneurship
		Seriousness of Leakage of the Brains
Related Industries	Industrial Environment	Degree of Labor Market of the Brains
		Degree of Cluster Complex Development
		Intensity of Local Competition
		Impact of IT & ITES on New Services and Products
	Competitiveness	Connectivity Cluster: Incumbent IT and ITES Industries
		High Competitive Area in IT & ITES
	Level of R&D Investment	Comparative Advantage in IT & ITES
Policy & Institution	Systematic Environment	Degree of Industry-Academy Cooperation
		E-Government Index
		Laws relating to IT&ITES
		Gov't Procurement of Advanced Tech
	Political & Economic Environment	Gov't Prioritization of IT & ITES
		Stability of Government
		Government Policy toward FDI
		Geopolitical Risks
		Flexibility of Regulation
	Financial Environment	Flexibility of Labor Laws for Industry
Dependence on Internal Fund		
		Financial Stability

➤ Accelerating Mechanism for Broadband Internet Connectivity (Sample)



⇒ **2⁴ structure for ICT Diagnosis**

ICT Diagnostic 2⁴ Structure (Sample)



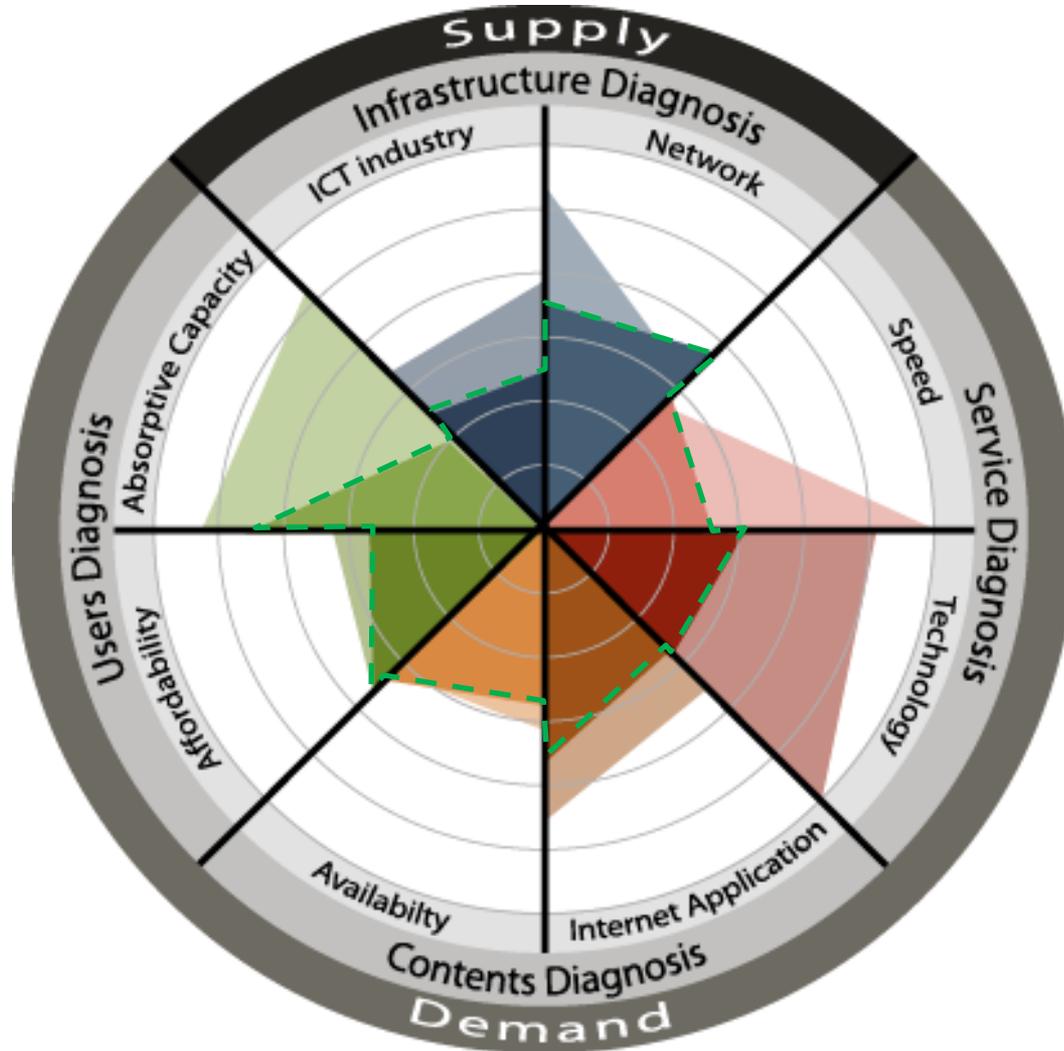
2 sections

4 diagnosis

8 characteristics

16 indicators

➤ Example of ICT Comprehensive Index



Korea
Brazil
El Salvador
Mongolia

➤ Application ICT Toolkit to Targeted Cities

- Evaluation of Potential ICT in Mumbai and Chittagong
- Analysis on Current State of Specialization of ICT in Mumbai and Chittagong with Locational Quotient

$$LQ = \frac{Xi / X}{Yi / Y}$$

X_i : the number of labor in ICT industry in Mumbai or Chittagong

X : the number of labor in gross industries in Mumbai or Chittagong

Y_i : the number of labor in ICT industry nationwide

Y : the number of labor of gross industries nationwide

- Selection of Promising ICT Industries and Comparative Analysis between Benchmarked Cities and Pilot Cities