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What ICT4D interventions work to improve economic growth outcomes in L&MICs: A rapid review

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Overview

- Theory
- Rapid review methods
- Rapid review findings

Background: ICTs and development

Information and communication technologies (ICTs) have great promise to reduce poverty, increase productivity, boost economic growth, and improve accountability and governance. World Bank (2012)

Theories of change: how can ICT improve economic outcomes?

- By making market work better (exchange)
 - Reduce transactions costs (trade, search, entry)
 - Reduce asymmetric information (increase information for exchange)
- By improving economic governance
 - Increase transparency
- By changing individual behavior
 - Address bounded rationality (nudges)
- By increasing efficiency or productivity
 - Increase information as input to production

Rapid evidence review methods

The objective is to use a methodological approach that allows implementers to conduct low-bias reviews in a shorter period of time and fewer labor resources than a standard systematic review

- Obtain unbiased sample of studies from a pre-existing evidence map
- Conduct quality appraisal using a simplified “practitioners” tool
- Preference for narrative synthesis

Data source: ICT4D evidence map

Intervention categories	Education & academe	Health	Democracy, human rights & governance	Agriculture & food security	Crisis and conflict	Economic growth, finance & trade	Environment & climate change	Water & sanitation	Energy
Digital infrastructure	1			2		1			
Policy and regulation for digital services									
Digital literacy	3	1	1	2		1			
Digital inclusion	3	4	1	4		1			
Digital finance			1	4		8			
E-governance	1		5	2		6			
Digital identity		2		1		2			
Data systems		11		1		2			
Digital information services	4	4	5	13	1	6	1		
Technology-assisted learning	18	24		1					
Mobile health	1	146				1		1	

Definitions: Intervention types

Name	Description
Digital infrastructure	Facilitating access to digital technology or improved digital infrastructure.
Digital literacy	Aims to improve a person's ability to use the internet or mobile devices.
Digital inclusion	Facilitating access to digital and data technologies, particularly – though not exclusively – for marginalized groups.
Digital finance	Promoting the use of mobile technologies for finance.
e-Governance	Facilitating the provision of government services and communication between the public and government agencies using digital technology.
Digital identity	Digitizing identification systems.
Data systems	Using digital technology to improve data collection, management and use.
Digital information and individual services	Digital technology for information dissemination and the provision of individual services to smooth information asymmetry or to change or 'nudge' behavior.
Mobile health (mHealth)	Use of mobile and wireless devices to provide medical care.

Economic indicators

- Consumption
- Income
- Remittances
- Savings
- Employment
- Loan repayments
- Price, quality, timeliness of public works
- Leakage
- Sales
- VAT payments
- Exports
- Firm entry
- Productivity

Practitioners' tool for critical appraisal

- Appraisal accounts for
 - Identification strategy
 - Research process
 - Peer review
 - Internal replication
 - Risks of bias from study implementation and analysis
 - Comparability between program and comparison
 - Outcomes measurement
 - Analysis and reporting
- Possible categories
 - Few limitations
 - Some limitations
 - Many limitations

Critical appraisal, subset of included studies

Authors (Year)	Short title	ICT intervention category	Identification strategy	Publication status	Other considerations	Limitations
Aker et al. (2016)	Payment mechanisms and anti-poverty programs	Digital financial services	Random assignment	Journal	Replication +	Few
Ali et al. (2018)	Building fiscal capacity in developing countries	Data systems	Difference in differences	Working paper	None	Many
Banerjee et al. (2017)	E-governance, accountability, and leakage in public programs	E-government	Random assignment	Draft paper	None	Some
Barnwal (2017)	Curbing leakage in public programs	E-government and digital identity	As-if random	Draft paper	None	Some
Batista and Vicente (2013)	Introducing mobile money in rural Mozambique	Data literacy	Random assignment	Working paper	Outcome measurement -	Some
Blumenstock et al. (2015)	Promises and pitfalls of mobile money in Afghanistan	Digital financial services	As-if random	Journal	None	Some
Cadena and Schoar (2011)	Remembering to pay	Digital information services	Random assignment	Working paper	None	Some
Carballo et al. (2016)	The border labyrinth	Data systems	Difference in differences	Working paper	None	Many
Dammert et al. (2015)	Integrating mobile phone technologies into labor-market intermediation	E-government and digital information services	Random assignment	Journal	None	Few

Included study features compared to total in map

Features	ICT 4 EG	Total ICT4D
Number of studies	25	253
Share evaluating pilot interventions	24%	80%
Share with an equity focus	16%	9%
Share reporting sex disaggregated outcomes	4%	27%
Share with cost information	20%	19%

Narrative synthesis: Digital financial services

Type of digital finance intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
Electronic payments using mobile money	Niger (1) Mexico (1) Afghanistan (1)	All studies document lower costs to the payor. Welfare effects for payees generally have null results with one study (with many limitations) suggesting benefits to rural households and one study (with few limitations) measuring time savings.	Few (1) Some (1) Many (1)
Access to or use of mobile money	Kenya (2) Uganda (2)	Agreement across studies of positive effect on consumption and consumption after a shock. Weak evidence of positive effect on the receipt of remittances. Single Kenya study (some limitations) measuring long-run effects reports positive effects also on savings, an effect on occupational choice, and stronger effects for female headed households.	Some (2) Many (2)

Narrative synthesis: Digital information services

Type of digital information service intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
SMS reminders for loan repayment and saving	Uganda (1) Philippines (1) Bolivia, Peru, Philippines (1)	Most of the results are null with a few positive effects	Few (1) Some (2)
Peer feedback SMS messages to motivate saving	Chile (1)	Positive effects on a population who have already opened a savings account and participated in a prior experiment	Some
Provision of job market information via SMS	Peru (1)	One study suggests that unemployed job seekers with skills and mobile phones are more likely to become employed in the first two months of receiving the text messages. Null results on earnings.	Few

Narrative synthesis: e-Government

Type of e-government intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
Provision of job market information via SMS	Peru (1)	One study suggests that unemployed job seekers with skills and mobile phones are more likely to become employed in the first two months of receiving the text messages. Null results on earnings.	Few
e-Procurement of public works	India (1) Indonesia (1)	Some evidence from one country of improved quality. Null results for price and timeliness.	Some (2)
Electronic intra-governmental fiscal transfers	India (1)	The study finds a reduction in leakage/corruption.	Some

Narrative synthesis: Digital identity

Type of digital identity intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
Biometric authenticated payments system	India (2)	Both studies find a reduction in leakage. In one case the leakage leads to black market sales; in the other the leakage likely benefits government officials (corruption). One study measures a reduction in transaction costs to beneficiaries	Few (1) Some (1)

Narrative synthesis: Data systems

Type of data systems intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
Electronic sales register machines	Ethiopia (1)	The study finds robust positive effects on firm sales, VAT payments, and employment	Many
Single electronic window for export processing	Costa Rica (1)	The study finds robust positive effects on the value of firm exports	Many

Narrative synthesis: Digital infrastructure

Type of digital infrastructure intervention	Countries (# studies)	Synthesized results for economic growth outcomes	Limitations
High-speed internet cables	12 countries in Africa in 1 study	This single paper essentially synthesizes evidence from across 12 African countries and finds strong evidence of employment growth from the availability of fast internet	Some*

Other intervention categories

- Digital inclusion
 - One study has combined intervention with digital financial services
- Digital literacy
 - One study finds literacy intervention increases uptake but economic indicators all based on games
- m-Health
 - One study of m-Health application for community health worker human resource management; no impacts on perceived supervision or motivation

Narrative synthesis by theory of change

Theory	Intervention types	Number of included studies	General findings
Reduce transactions costs	Digital financial services Digital identity Data systems	9	Positive
Improve information (exchange)	Digital information services E-government	3	Null to weakly positive
Increase transparency	E-government Digital identity Data systems	6	Positive
Address bounded rationality (nudge)	Digital information services	4	Null
Improve information (productivity)	Digital infrastructure	1	Positive

Preliminary conclusions

- Mobile money payments lower costs to the payor
- Access to mobile money can benefit consumption, especially after shocks
- Evidence from one country that providing employment information through SMS can reduce search time
- India has reduced leakages through electronic intra-governmental fiscal transfers and biometric authentication
- There is initial evidence that government introduction of electronic data systems can benefit firms
- Availability of fast internet in Africa increased employment

Limitations

- Evidence map only had single screeners at title and abstract level
- Likely to miss some studies due to broader search for the evidence map
- Search not updated after the evidence map (other than checking for updates on included studies)
- Narrative synthesis
- Agriculture and food security studies not included

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Thank you!

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