Fighting poverty with technology

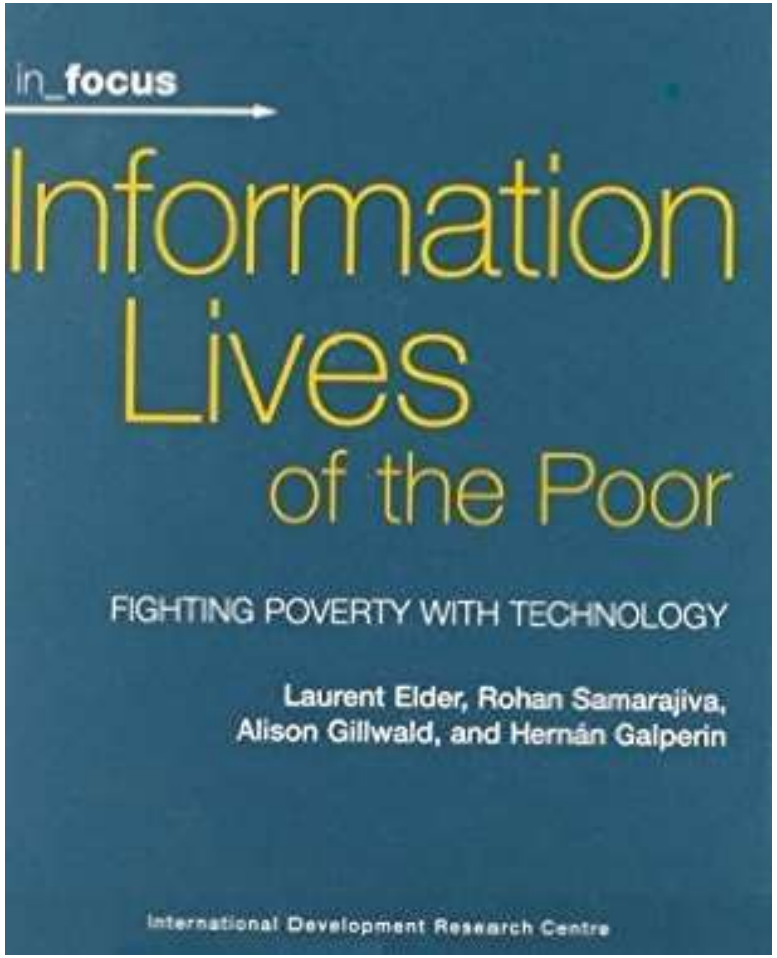
Rohan Samarajiva

Florida State University, 7 January 2016

LIRNEasia
Pro-poor. Pro-market.

Sub-title of a book I co-authored

- Not one that I necessarily agree with
- Problematic metaphor to describe what my organization does
- But not a bad way to explain some of what is going on in the development field



Fighting poverty with technology

- Military metaphor has parallels with American approach to war
  - Use a lot of technology from a distance; keep American casualties to a minimum
- A recent example in development space
  - Big data for development: Mapping poverty from afar

"They combined this information with responses collected from about 850 cellphone owners to build an algorithm that predicts how wealthy or impoverished a given cellphone user is.

Using the same model, the researchers were able to answer even more specific questions, like whether a household had electricity.

The researchers are trying to do similar work in Afghanistan, where certain areas are difficult or dangerous to access and ground surveys are not possible.

"We don't think this method is the be-all or end-all, but in the absence of good information, this is better than nothing," Dr. Blumenstock said."

From *New York Times*, describing a colleague's work

Let’s start with poverty

And end with technology

Who was responsible for moving the largest number of people out of poverty?

- US Agency for International Development
- World Bank
- UK Department for International Development
- Norway Aid (NORAD)
- Qatar Fund
- Nelson Mandela
- Deng Xiao Ping & Chinese Communist Party
- Narasimha Rao-Manmohan Singh-Montek Singh Ahluwalia-others in Indian Government

Listening to Montek a few weeks back

- He talked about environment within which economic reforms occur, including
  - The tremendous demand for a better life among the poor and the not so poor, which he believes is driven by what they see in the media, especially TV

Theory of change in Daniel Lerner's *The passing of traditional society* (1958)

- Technology, in the form of radio broadcasting, would show those living in traditional societies (the poor) what the good life could be
- This would create pressure for change from the bottom and traditional societies would be no more

Technology ➔ changed poor ➔ government/social change

- India, almost 60 years later, is still traditional but the pressure for change is being felt
  - Maybe Lerner had a point

Deng Xiao Ping

- Contrary to Mao who launched campaigns to get people to do things (and failed, at great cost), Deng removed constraints (liberalized, permitted) and succeeded
  - Decentralized initiative took million out of poverty
  - Some picking of winners happened too
  - But at base, people acted, without papers, without approvals, without safety nets . . .
    - Some suffered negative consequences, but many live better today than they did under Mao

Policy change (liberalization) ➔people act ➔ poverty reduced

- Where was the external impetus that caused people to act? Technology?

There was an external influence . . .

- “Foreign education, particularly higher education, has proved to be an important channel of knowledge transfer. . . . A more recent and well-known example is China when it started reforms. At the invitation of leaders and officials from the Chinese government, a stream of foreign experts started to visit the country to help them learn about the workings of a market economy, the institutions underpinning it, and its responses to change. At the same time, a stream of Chinese students left to be trained in U.S. and European universities.”

Michael Spence, *Growth Commission Report*, p. 44

Lerner v Inferred Deng

Lerner

- The poor lack agency
- External force through technology
- Not as directive as Mao or as some development practitioners
- Changes in ways government worked implied (more like America)

Inferred Deng

- No explicit theory on whether they have agency or not
- External ideas sought and adapted
- “Making money is good”
- Government changes were completely off the table

Where does LIRNEasia fit?

About LIRNE*asia*

- Our mission:
  - *"Catalyzing policy change through research to improve people's lives in the emerging Asia Pacific by facilitating their use of hard and soft infrastructures through the use of knowledge, information and technology."*

= Take people out of poverty?

Countries that we engage with

An example of what we do: Defeating a regressive tax

What we did in five working days in 2007

Anatomy of a regressive tax

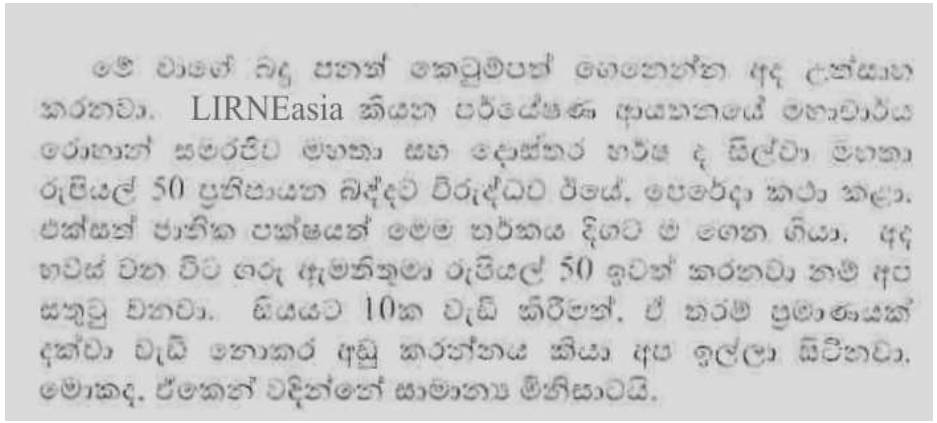
	+General tax	pre-2007	Proposed		Revised	
Value	+17.5% VAT & SRL	+2.5% MSL	+7.5% MSL & 50	Tax as % of value	+10% MSL	Savings
200	235	241	303	51.3	259	-44
400	470	482	555	38.8	517	-38
600	705	723	808	34.6	776	-32
800	940	964	1061	32.6	1034	-27
1000	1175	1204	1313	31.3	1293	-21
1200	1410	1445	1566	30.5	1551	-15
1400	1645	1686	1818	29.9	1810	-9
1600	1880	1927	2071	29.4	2068	-3
1800	2115	2168	2324	29.1	2327	3
2000	2350	2409	2576	28.8	2585	9

Range of Prepaid ARPUs

Relative winners

Losers

From the Hansard, September 6, 2007



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Translation: *We will be pleased if Hon. Minister removes the regressive tax of LKR 50 as pointed out by Prof. Rohan Samarajiva, Dr. Harsha de Silva of LIRNEasia and UNP Members. We also request not to increase the mobile subscriber levy to 10%. This tax will have an adverse effect on the common man.*

Taxing Sri Lanka's mobile customers - LANKA BUSINESS ONLINE - Mozilla Firefox

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http://www.lbo.lk/fullstory.php?newsID=1160489410&no_view=1&SEARCH_TERM=24

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phones are those at the BOP, those who do not have a lot of money in their pockets, those who will be paying small amounts.

These are the beneficiaries of continued growth in the mobile segment; these are the people who will be shut out from the information society if growth is stifled or the costs of mobile ownership are raised beyond their reach.

Harassing the goose

According to the fable, the regular supply of golden eggs was not enough for the foolish owners; blinded by greed, they cut open the goose to get all the eggs at once. They found to their grief that there was no trove of golden eggs in the goose's stomach; that their greed had deprived them of any more golden eggs.

I do not accuse the government of being that foolish. They are not killing the goose; their behavior is more like that of trying to milk the goose for more eggs. The end result, however, will be a stressed goose yielding less eggs than it otherwise would have.

It is widely recognized that the new subscribers obtaining telecom services will be from the bottom of the pyramid. The average revenue per subscriber of Hutch, an operator that specializes in serving the BOP is 311 rupees. Let us see what the new taxes mean for this subscriber:

• Today the average Hutch customer pays 311 rupees a month, of which approximately 55 rupees currently goes to the government, leaving around 255 rupees for phone calls.

• The new proposals will increase the government's take to around 120 rupees by taking a 50 rupee fixed tax plus 7.5 percent mobile levy on top of the general taxes.

• That leaves a mere 191 rupees for the subscriber to use on phone calls.

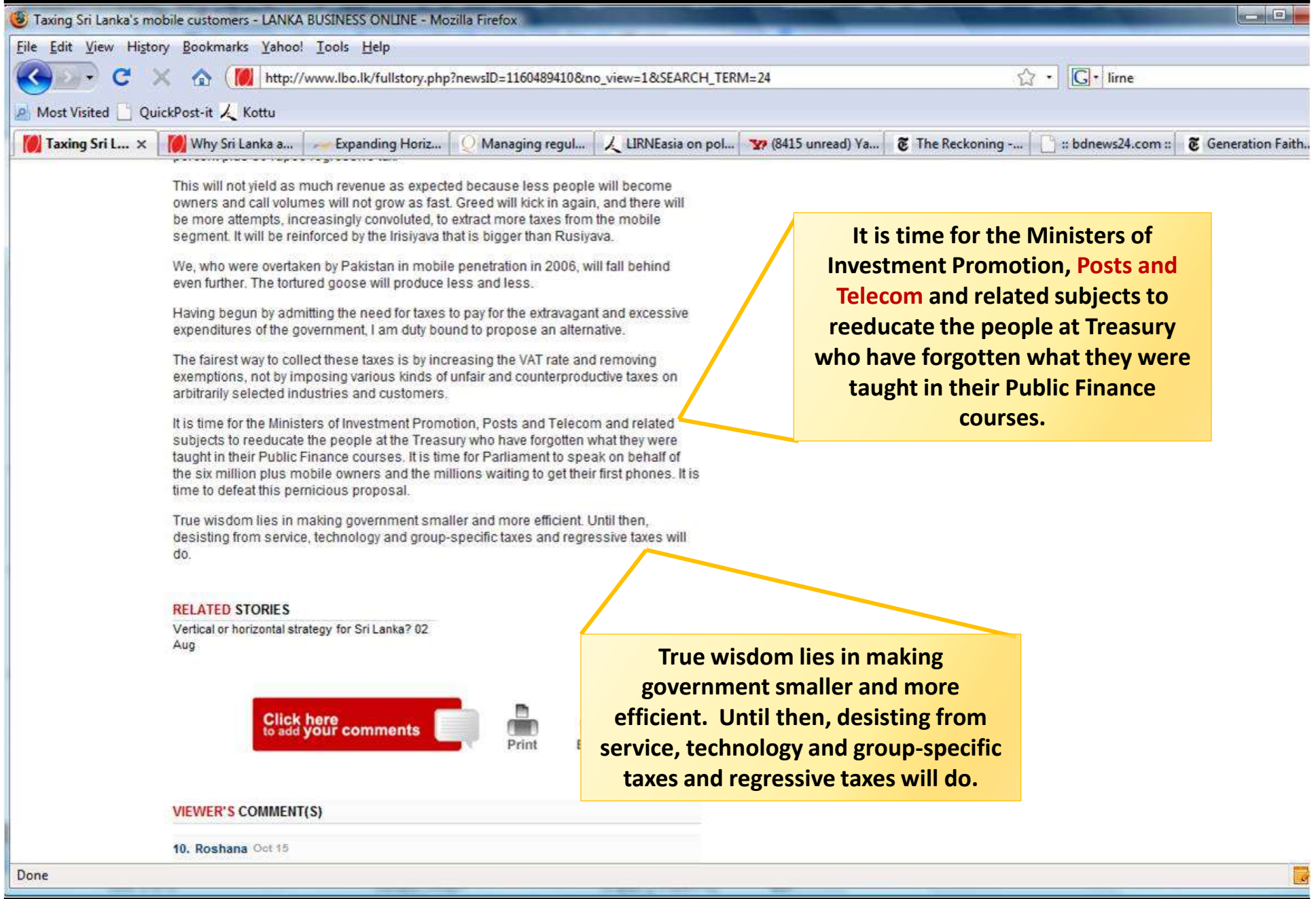
Figure 2: Impact of proposed taxes on average Hutch customer

People will not stop using mobiles because of these taxes; but they will call less. Most importantly, the new subscribers planning to join the ranks of levy- and VAT-paying subscribers will do so at a much slower pace.

The government will get less tax revenues than it thinks it will. It may get a little more than it

Done

"I do not accuse the government of being that foolish. They are not killing the goose; their behavior is more like that of trying to milk the goose for more eggs. The end result, however, will be a stressed goose yielding less eggs than it otherwise would have"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Taxing Sri L... Why Sri Lanka a... Expanding Horiz... Managing regul... LIRNEasia on pol... (8415 unread) Ya... The Reckoning -... :: bdnews24.com :: Generation Faith..
This will not yield as much revenue as expected because less people will become owners and call volumes will not grow as fast. Greed will kick in again, and there will be more attempts, increasingly convoluted, to extract more taxes from the mobile segment. It will be reinforced by the Irisiyava that is bigger than Rusiyava.
We, who were overtaken by Pakistan in mobile penetration in 2006, will fall behind even further. The tortured goose will produce less and less.
Having begun by admitting the need for taxes to pay for the extravagant and excessive expenditures of the government, I am duty bound to propose an alternative.
The fairest way to collect these taxes is by increasing the VAT rate and removing exemptions, not by imposing various kinds of unfair and counterproductive taxes on arbitrarily selected industries and customers.
It is time for the Ministers of Investment Promotion, Posts and Telecom and related subjects to reeducate the people at the Treasury who have forgotten what they were taught in their Public Finance courses. It is time for Parliament to speak on behalf of the six million plus mobile owners and the millions waiting to get their first phones. It is time to defeat this pernicious proposal.
True wisdom lies in making government smaller and more efficient. Until then, desisting from service, technology and group-specific taxes and regressive taxes will do.
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10. Roshana Oct 15
Done
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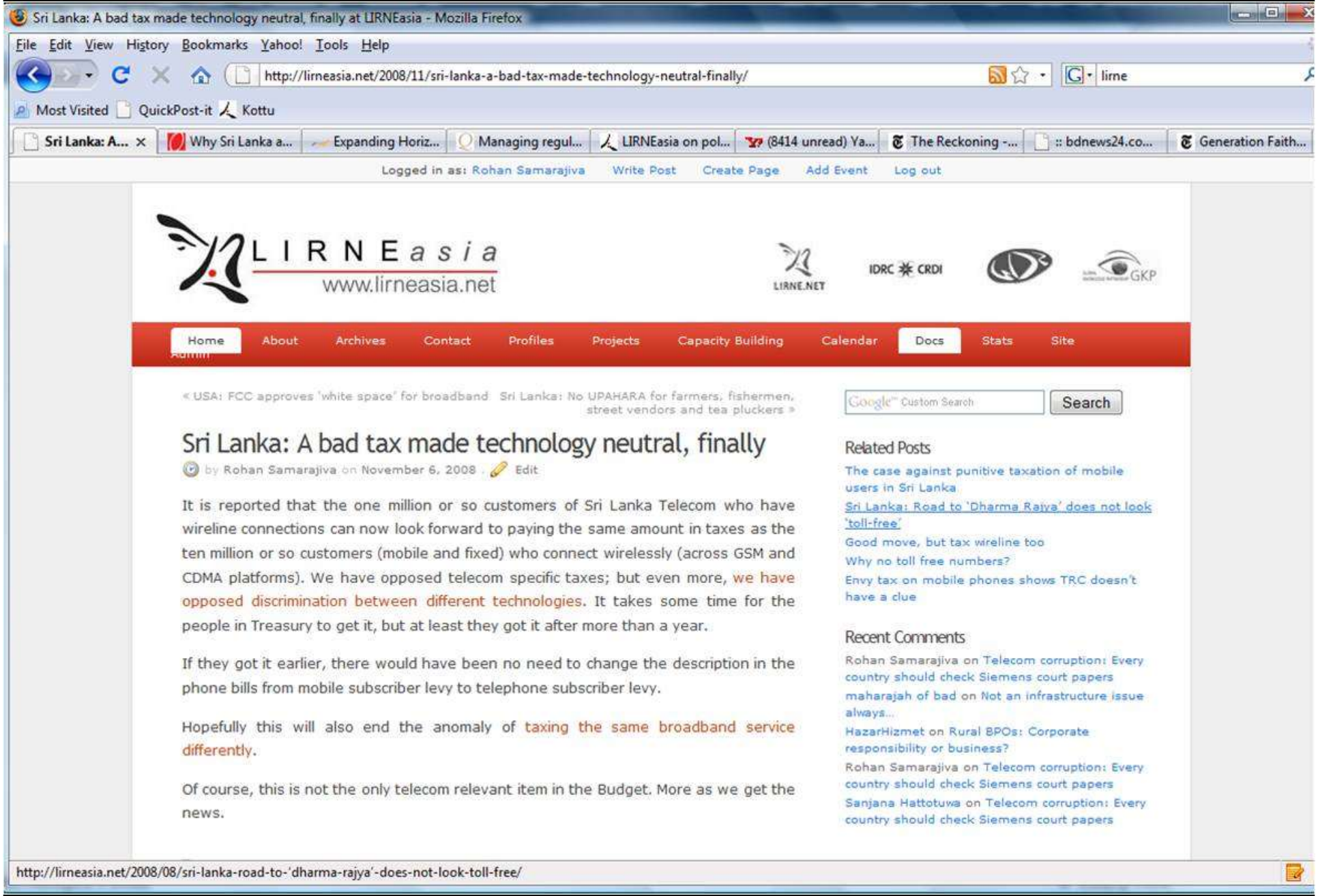
November 6, 2008



Effect on poverty? Use of technology?

- Clearly helped those who pay less (poor?) versus those who pay more (rich?)
  - Had evidence from Teleuse@BOP surveys
- But was making mobile use cheaper for the poor a good thing in terms of poverty alleviation?
  - What does the research say?

Does mobile use reduce poverty?

A Systematic Review

- Uses ***explicit methods*** to ***identify, select***, and ***critically appraise*** relevant research and ***summarize*** data from those studies that are included in the review
  - Biased towards quantitative to begin with, but now moving towards mixed methods and qualitative
- Originally from the field of medicine, now includes social sciences
- Uses only primary studies
- Protocols are registered
- Peer review is mandatory and has teeth

LIRNEasia's role

- Initially got into it in 2011
  - 3ie funding and training ➔ Mobiles & rural impact, discussed today
- Received IDRC funding in 2014 for reviews and capacity building
  - 70+ researchers introduced to systematic reviews
  - 40 researchers taught systematic reviews in depth
  - 15 researchers engaged in systematic reviews
  - 3 SRs completed
    - Effects of mobile financial services
    - ICTs in the classroom
    - Benefits of mobiles for SMEs
- Currently working in partnership with DFID and PwC India to build further capacity in South Asia

Mobile phones ➔ Economic impact

Christoph Stork, Nilusha Kapugama & Rohan Samarajiva

LIRNEasia
Pro-poor. Pro-market.

3ie International Initiative for Impact Evaluation

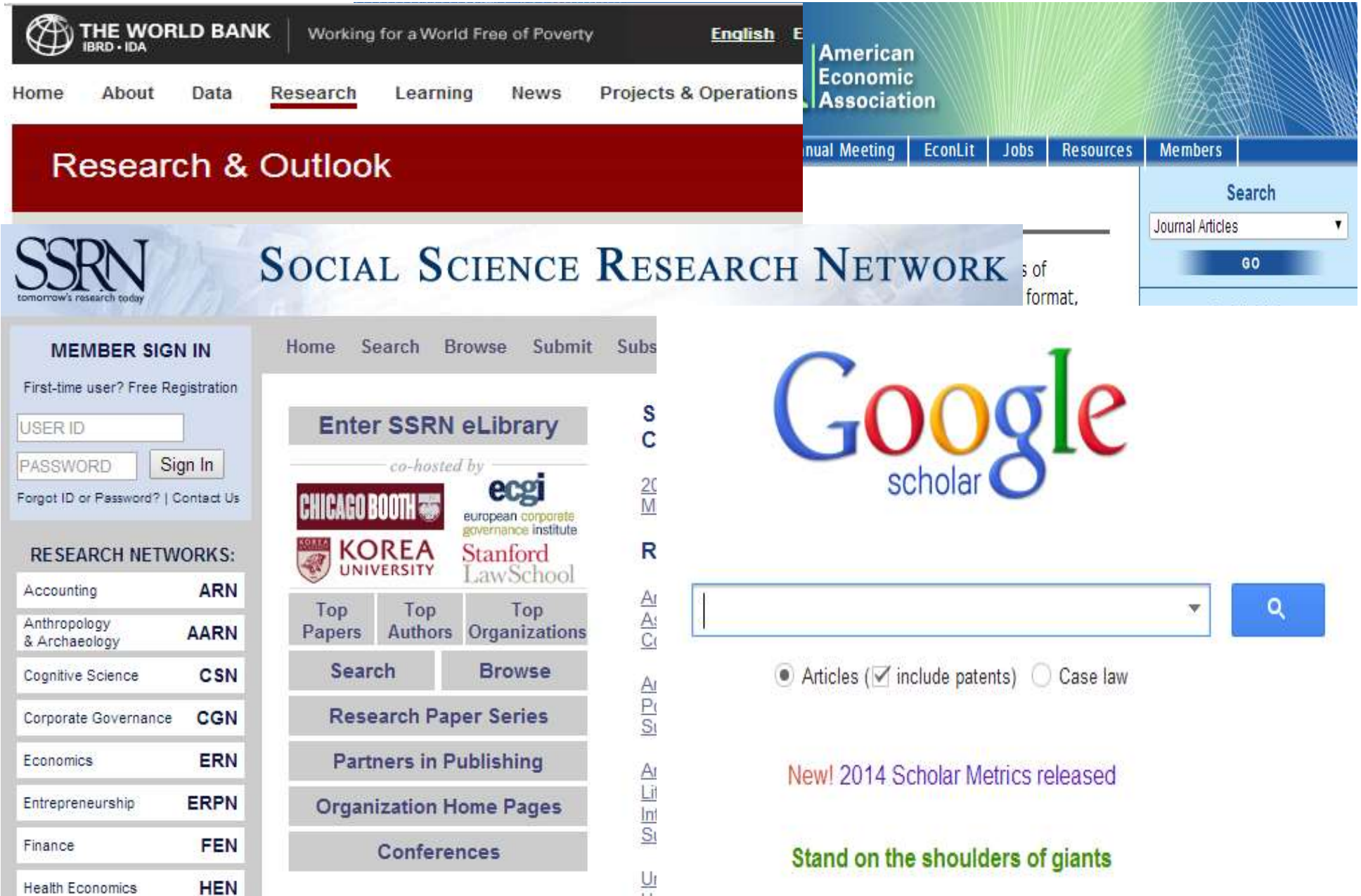
This work was carried out with the aid of a grant from the International Initiative for Impact Evaluations (3ie)

About the review

- What did we study?
  - Mobile phone interventions for improving **economic and productive outcomes** in **rural areas** in low and middle-income countries (LMICs)

- Economic and productive outcomes = changes in:
  - Individual income/savings/wages/expenditure
  - Household income/savings/expenditure
  - Business profit/productivity
  - Wastage
  - Market price dispersion or volatility

What did we do?



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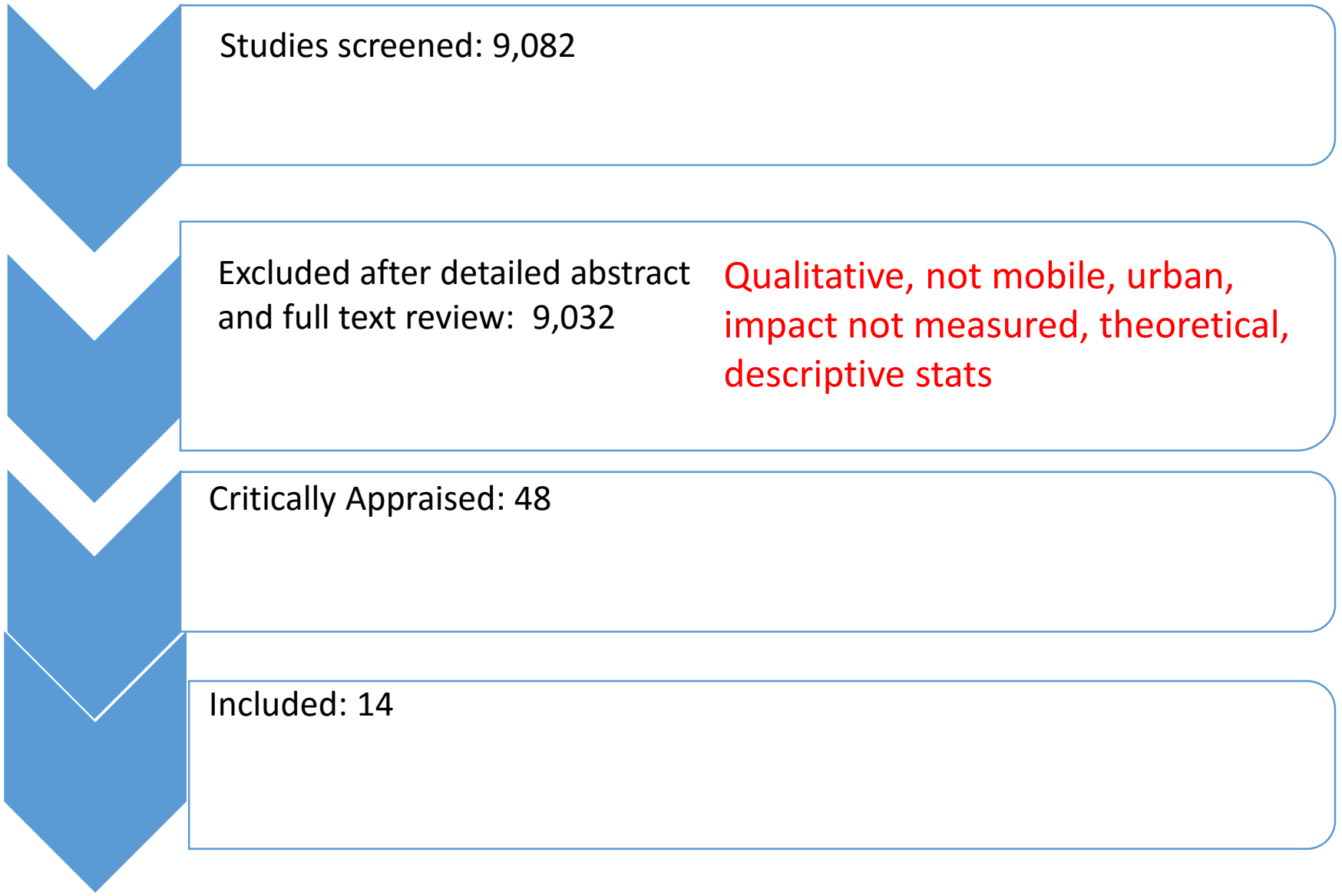
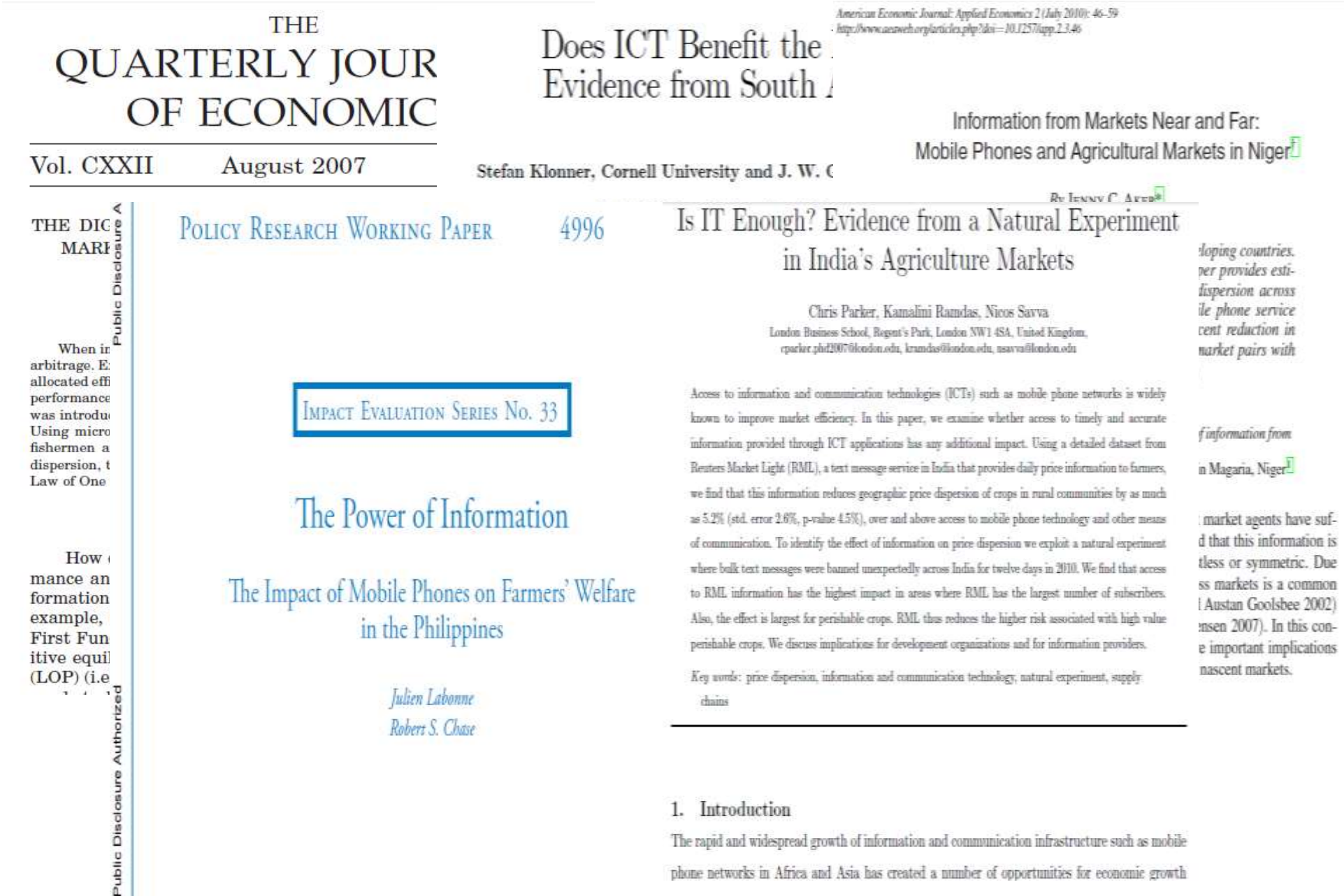


What did we find?



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Vol. CXXII August 2007

Does ICT Benefit the
Evidence from South

Stefan Klonner, Cornell University and J. W.

American Economic Journal: Applied Economics 2 (July 2010): 46–59
http://www.aeaweb.org/articles.php?doi=10.1257/app.2.3.46

Information from Markets Near and Far:
Mobile Phones and Agricultural Markets in Niger

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IMPACT EVALUATION SERIES No. 33

The Power of Information

The Impact of Mobile Phones on Farmers' Welfare in the Philippines

Julien Labonne
Robert S. Chase

Is IT Enough? Evidence from a Natural Experiment in India's Agriculture Markets

Chris Parker, Kamalini Ramdas, Nicos Savva
London Business School, Regent's Park, London NW1 4SA, United Kingdom,
cparker.phd2007@london.edu, kramdas@london.edu, nsavva@london.edu

Access to information and communication technologies (ICTs) such as mobile phone networks is widely known to improve market efficiency. In this paper, we examine whether access to timely and accurate information provided through ICT applications has any additional impact. Using a detailed dataset from Reuters Market Light (RML), a text message service in India that provides daily price information to farmers, we find that this information reduces geographic price dispersion of crops in rural communities by as much as 5.2% (std. error 2.6%, p-value 4.5%), over and above access to mobile phone technology and other means of communication. To identify the effect of information on price dispersion we exploit a natural experiment where bulk text messages were banned unexpectedly across India for twelve days in 2010. We find that access to RML information has the highest impact in areas where RML has the largest number of subscribers. Also, the effect is largest for perishable crops. RML thus reduces the higher risk associated with high value perishable crops. We discuss implications for development organizations and for information providers.

Key words: price dispersion, information and communication technology, natural experiment, supply chains

1. Introduction

The rapid and widespread growth of information and communication infrastructure such as mobile phone networks in Africa and Asia has created a number of opportunities for economic growth

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Austan Goolsbee 2002)
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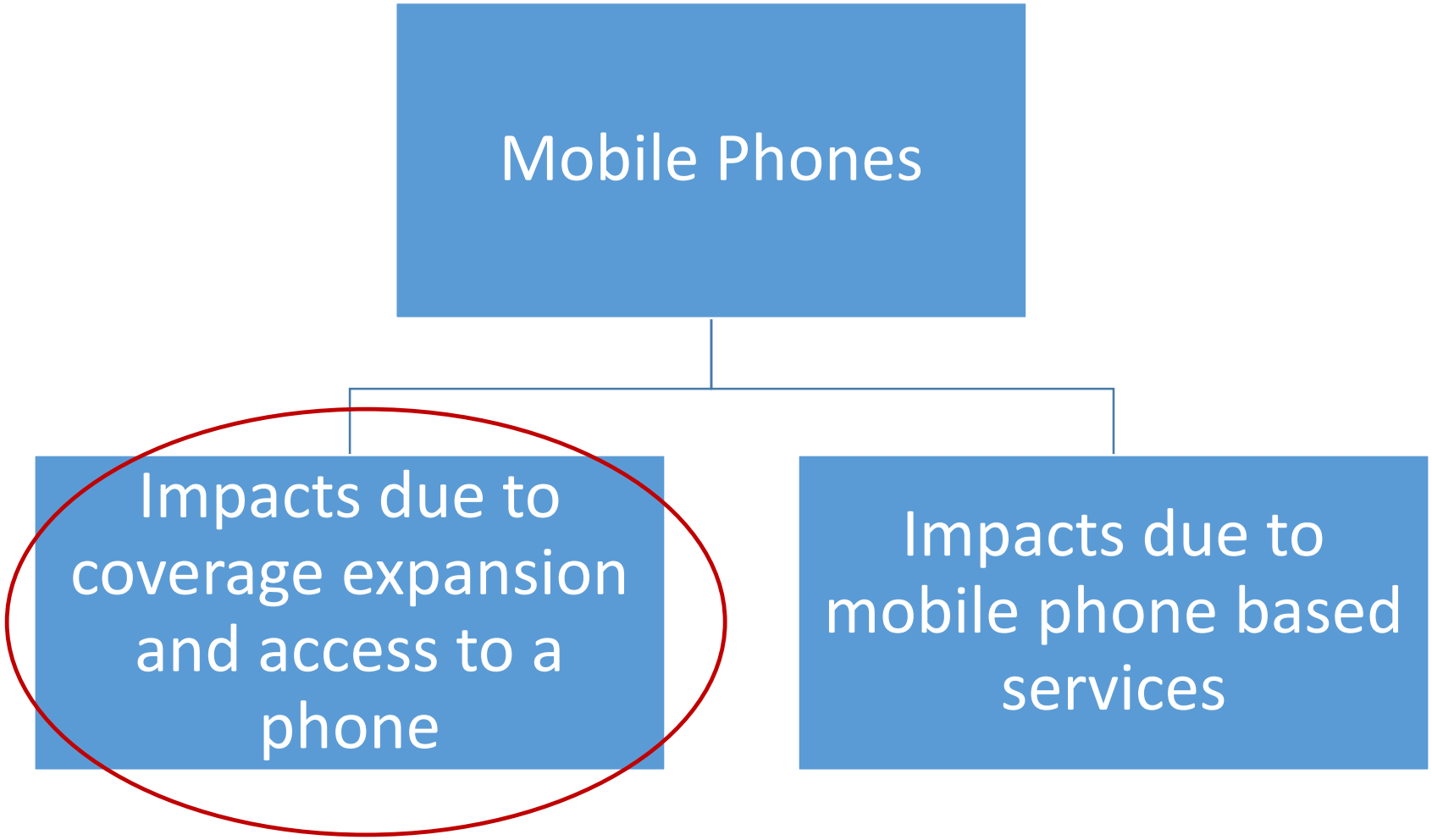

Mobile Phones
Impacts due to coverage expansion and access to a phone
Impacts due to mobile phone based services

About the studies

Author	Observations	Occupations	Duration	Location
Jensen (2007)	74,700	Fishers, traders	1997-2001	Kerala, India
Aker (2010)	53,820	Traders	1999-2006	Niger
Aker and Fafchamps (2011)	39,120	Traders, farmers	1999-2008	Niger
	2,503			
Labonne and Chase (2009)	2,092	Farmers	2003-2006	Philippines
Beuermann et al. (2012)	40,000	Cross-sectoral	2001-2007	Peru
Klonner and Nolen (2008)	57,486	Cross-sectoral	1996-2001	South Africa

Findings

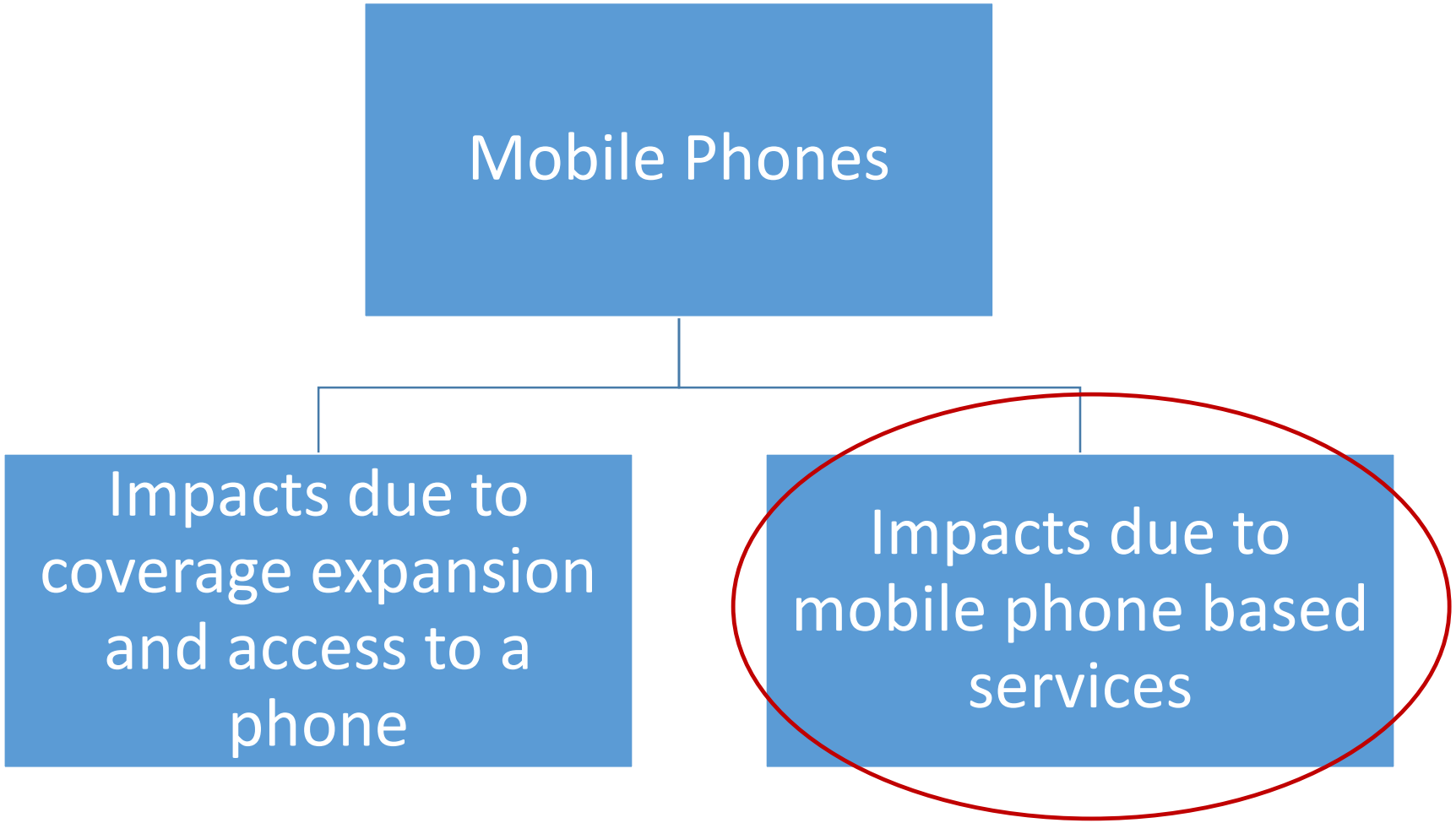
Author	Findings
Jensen (2007)	INR 5 reduction in Max-Min spread of prices between market
	fishermen's profits increased on average by 8% consumer price reduced by 4%
	5-8% waste reduced to almost 0
Aker (2010)	10%-16% reduction in grain price dispersion. The effect is stronger for market pairs with higher transport costs
Aker and Fafchamps (2011)	50% reduction in the Max-Min price spread of farm-gate prices within a region
	reduces producer price dispersion for cowpeas by 6%. No higher producer prices but lower intra-annual price risk for farmers.
Labonne and Chase (2009)	increase in growth rate of per capita consumption: 15% (excluding communication)

Findings

Author	Findings
Klonner and Nolen (2008)	Employment increases by 15 % when a locality receives complete network coverage (increased employment by women).
Beuermann et al. (2012)	Wage income increases by 15% after 2 years coverage, 34% after 6 years of coverage. Value of household assets increases by 23% 2 years after coverage, and increases to 54% after 6 years of coverage.

Mobile network expansion has impact

- Causal mechanism
  - Improves coordination between buyers and sellers in hitherto separate agricultural markets, in effect merging them into a bigger market
    - Reduces price dispersion (Law of One Price) and aligns supply and demand (Say's Law)
  - Has similar effect on labor markets
    - Indirect effects too
    - In South Africa mobile coverage increased likelihood of someone being employed by 33.7%
  - Economic improvements were reflected in rising disposable income, household assets and thus expenditure (easier to measure)
    - Expenditure increased by 44.6%, six years after coverage arrived in Peru
    - Resulted in increased growth of consumption (about 15%) among farmers in Philippines, excluding communication-related consumption
- But enabling conditions (which vary even within countries) must exist, e.g.,
  - Even if price/demand information available from new location through mobile communication, it must be possible for the supplier/trader to take commodity to that place: physical transport
  - The institutional conditions must permit the action. If the fisher/trader is not empowered to sell in new location by owner of boat/grain, information by itself will not improve outcomes


Mobile Phones
Impacts due to coverage expansion and access to a phone
Impacts due to mobile phone based services

About the studies

Author	Service Offered	Sample/obs	Duration	Location
Fafchamps and Minten (2011)	Price, weather and crop advisory information via SMS	1,000	12 months	Maharashtra, India
Parker et al. (2012)	Price information via SMS	14,349	12 months (12 days)	India
Camacho and Conover (2011)	Price and weather information via SMS	1,107	26 weeks	Colombia

Findings

Author	Findings	
Fafchamps & Minten (2011)	price dispersion	Not generalizable
	price received by farmers	**Not generalizable**
	crop loss	**Not generalizable**
	likelihood of changing crop varieties and cultivation practices	**Not generalizable**
Parker et al. (2012)	Price dispersion for crops for each state	5.2% higher spatial price dispersion during a bulk SMS ban
Camacho & Conover (2011)	sale price	**Not generalizable**
	farmers' revenues	**Not generalizable**
	household expenditures	**Not generalizable**
	crop loss	**Not generalizable**

Reasons for impact (or inability to find impact)

- Too short a time to find effects
- Problems with targeting
  - Did the intended beneficiaries get the relevant information at the relevant time?
- Language issues
- Literacy issues – especially with SMS
- Push versus pull service
- Experience in using the service

Causal mechanism & enabling conditions

- Causal mechanism same as with network extension (difference being proactive supply of information)
  - Hitherto separate markets consolidated through ICTs
- Information services reduced price dispersion but the desired impacts were not seen
- Same qualifications re enabling conditions

Where is the technology?

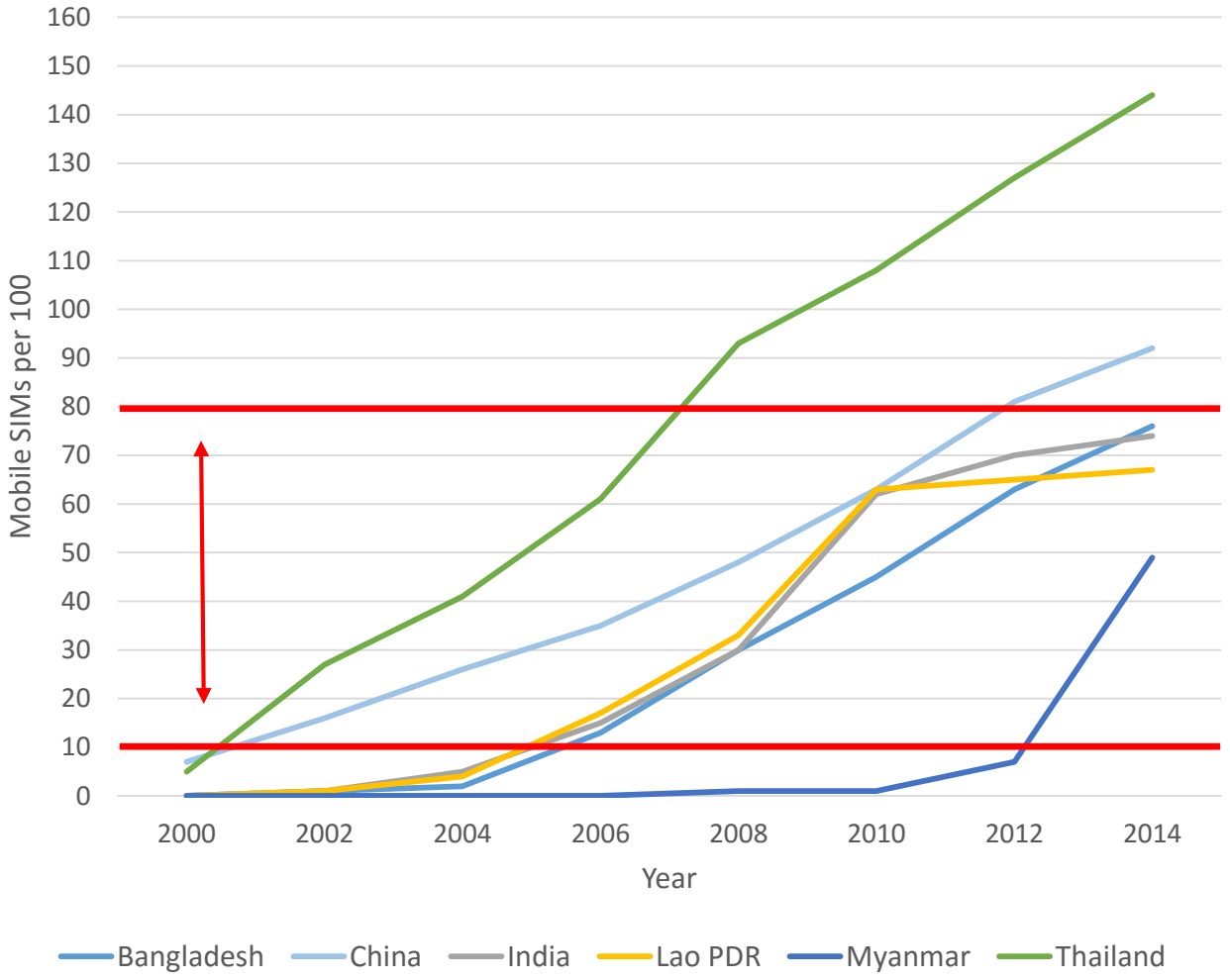
Our theory of change

- Look for fissures in existing iron triangles/policy windows
  - ICT seems to be associated with fissures and windows
- Intervene in multiple ways to catalyze/shape actions by decision makers in government/industry
  - Example: helping government and stakeholders in Myanmar go from 10 SIMs/100 in 2012 to 80 SIMs/100 in 2017
    - Training for regulatory staff, civil society, etc., from 2013
    - Formal and informal advice, including responses to public consultations
    - Broadening policy horizons, especially regarding Internet
- Create space for decentralized innovation
- People will act to improve their lives = more people will emerge from poverty

We catalyze the removal of barriers to ICTs.
Barriers are removed.
Supply improves.
People use ICTs to improve their lives.
They get themselves out of poverty.

Goal of Myanmar ICT Policy

10 SIMs per 100 people in 2012 to 80 SIMs per 100 in 2017



Source: World Bank

Comparators are countries sharing borders with Myanmar

But, that is not all . . .

- Myanmar advanced 8 positions in the ITU's ICT Development Index, overtaking both Pakistan and Bangladesh and is now ranked 142nd among countries ranked by the Index
  - Principal drivers of better performance were Internet related
    - Active mobile broadband subscriptions per 100 inhabitants increased from 0 to 14.9 within four years, with the actual increase occurring in 2014-15 after the reforms
    - As a result, Myanmar's Use Sub-index value is almost three times that of Pakistan and more than double that of Bangladesh. These countries had started their sector reforms almost two decades earlier and were not disadvantaged vis-à-vis Myanmar.

Role played by the people

- LIRNEasia survey (February-March 2015) showed that by then 63 percent of all phone owners had purchased smartphones, with three percent owning both smartphones and feature phones. Smartphone penetration is now as high as 70 percent according to some reports.
- The availability of relatively low-cost smartphones was a critical external factor. While cheap smartphones were found among those surveyed, the mean price that had been paid was USD 87.
- Despite continuing problems with the standardization of the Myanmar font, the smartphones made it possible for the rapid take-up of data services. At the end of its first quarter of operations (end 2014), Telenor Myanmar reported that 40 percent of its customers were daily data users.