

# Substitution and complementarities in telecom service use: case study of the Peruvian urban poor

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# Agenda

- Introduction
- Background data
- Results
  - Mobile use
  - Mobile subscription
  - Call patterns
  - ICTs used
- Final thoughts

# Introduction

- Ultimate goal: design effective pro poor pro market regulation and universal access policies
- Key to appropriate design:
  - understand the needs that should be addressed.
  - Understand the constraints.
- Spectacular growth of mobile take-up.
- DIRSI survey in 7 countries in LAC to examine mobile service use by the urban poor (Galperin and Mariscal, 2007).
- National reports available at [www.dirsi.net](http://www.dirsi.net)

# Background data

- Teledensity in Peru:
  - 9.64 fixed – 32.3 *LA average*
  - 55.63 mobile – 71.6 *LA average*
- Among poor households (45%):
  - 8.3% fixed
  - 10.6% mobile
- DIRSI survey among hh in Socio economic strata D and E (housing conditions): “Bottom of the Pyramid”.

# Mobile Use

- 60% of sample are users, of which only 60% are subscribers.
- Individual utility maximization model – Discrete choice conditional probability.
- Donner (2007) cites Hodge (2005): mobile is a substitute to fixed in BOP, but complementary in higher income hh.
- Basic hypotheses in this paper:
  - Individual characteristics
  - Household characteristics (interactions - externalities)
  - Familiarity with ICTs

# Mobile use – Logit regression

- Hypotheses. Probability of mobile use is higher when the individual is:
  - Employed,
  - independent worker,
  - Younger,
  - More educated.
  - Member of a larger family –significant and positive,
  - Level achieved by hh member most educated –significant and positive,
  - Estimated probability of internet use (on per cápita hh expenditure) –complementary,
  - Fixed telephone at home –substitute (Hodge, 2005, South Africa).
  - Use of public telephony –non significant

# Mobile subscription: Logit regression

- Hypothesis. Probability of mobile subscription is higher when the individual is:
  - Employed,
  - Younger,
  - More educated.
  - Member of a larger family –significant and positive,
  - Estimated probability of internet use (on hh expenditure) –complementary,
  - Fixed telephone at home –substitute (Hodge, 2005, South Africa).
  - Use of public telephony –non significant
- Caveat: no data on prices or income

# Call patterns: OLS

- Number of calls made by users on mobile:
  - Substitute for public phone calls
  - Number of ICTs used
  - Experience on mobile use (months using)
  - Complement to SMSs
  - Education
  - Head of household



# Number of ICTs used: OLS

- Higher when the individual is
  - More educated
  - Mobile user
  - Employed
  - Internet user
  - Public phone user
  - Older
  - Member of a larger hh

# Final thoughts

- Mobile telephony is a substitute for fixed among the urban poor, and complement to SMSs, internet.
- Mobile use may increase as more ICTs are used.
- Mobile as a platform for UA policies – may overcome the learning barrier.

*Merci*  
*Gracias*  
*Thanks*

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More information: [www.dirsi.net](http://www.dirsi.net)

# Mobile use – Logit regression

<i>Variables</i>	<i>Coefficients</i>	<i>Marginal effects</i>
Years of education	0.0949 *** (0.0262)	0.0224 *** (0.0062)
Head of household	0.2582 (0.2083)	0.0604 (0.0484)
Male	-0.1426 (0.1640)	-0.0337 (0.0387)
Age	-0.0247 *** (0.0062)	-0.0058 *** (0.0015)
N° household members	0.2045 *** (0.0501)	0.0482 *** (0.0118)
Yrs. of ed. of most educated member	0.1185 *** (0.0359)	0.0280 *** (0.0085)
Worked previous week	0.6924 *** (0.1800)	0.1645 *** (0.0426)
Independent worker	0.2830 * (0.1616)	0.0659 * (0.0371)
Public telephony user	-0.0966 (0.1419)	-0.0227 (0.0331)
Fixed phone in home	-1.1197 *** (0.1903)	-0.2724 *** (0.0447)
Pred. prob. internet use (per cap. exp.)	2.5656 *** (1.0548)	0.6049 *** (0.2480)
Constant	-2.7832 *** -0.4477	***
N° observations	1245	
Pseudo R <sup>2</sup>	0.1497	

Standard errors in parentheses

\*\*\* Significance level=0.01

\* Significance level=0.1

# Mobile subscription

<i>Variables</i>	<i>Coefficients</i>		<i>Marginal effects</i>	
Years of education	0.1390	***	0.0315	***
	(0.0284)		(0.0064)	
Head of household	0.2319		0.0528	
	(0.1973)		(0.0452)	
Male	-0.0795		-0.0180	
	(0.1555)		(0.0352)	
Age	-0.0125	**	-0.0028	**
	(0.0061)		(0.0014)	
N° household members	0.1494	***	0.0339	***
	(0.0464)		(0.0105)	
Yrs. of ed. of most educated member	0.0024		0.0005	
	(0.0368)		(0.0083)	
Worked previous week	0.9965	***	0.2152	***
	(0.1776)		(0.0359)	
Independent worker	0.1279		0.0291	
	(0.1504)		(0.0344)	
Public telephony user	-0.1546		-0.0353	
	(0.1413)		(0.0325)	
Fixed phone in home	-0.4507	**	-0.0964	**
	(0.1892)		(0.0379)	
Pred. prob. internet use (per cap. exp.)	2.7110	***	0.6141	***
	(0.9307)		(0.2114)	
Constant	-3.4443	***		***
	(0.4424)			
N° observations	1245			
Pseudo R <sup>2</sup>	0.1139			

Standard errors in parentheses

\*\*\* Significance level=0.01

\*\* Significance level=0.05

# Call patterns: OLS

<i>Variables</i>	<i>Coefficients</i>
Mobile ownership	2.9630 *** (0.4042)
Months of mobile use	0.0286 ** (0.0123)
Age	-0.0020 (0.0212)
Years of education	0.2365 *** (0.0697)
Worked previous week	0.2798 (0.4980)
Fixed phone in home	1.2214 (1.2420)
Makes calls on public tel.	-1.7837 *** (0.6292)
Head of household	1.1436 * (0.6449)
N° ICTs used to make calls	1.5978 *** (0.3682)
Sends SMS	2.8580 *** (0.7101)
Internet user	-0.0493 (0.6732)
Constant	-3.2800 *** (0.9972)
N° observations	753
R <sup>2</sup>	0.2232

Standard errors in parentheses

# ICTs used to make calls: OLS

<i>Variables</i>	<i>Coefficients</i>
Years of education	0.0353 *** (0.0050)
Mobile user	0.7895 *** (0.0599)
Worked previous week	0.0612 * (0.0407)
Public telephony user	1.028 *** (0.0375)
Internet user	0.3275 *** (0.0468)
User from Trujillo	0.3722 *** (0.0685)
User from Puno	-0.1355 ** (0.0601)
N° household members	0.0133 * (0.0093)
Age	0.0082 *** (0.0015)
Male	-0.0134 (0.0382)
Constant	-0.1901 ** (0.0949)
N° observations	1249
Pseudo R2	0.5737

Standard errors in parentheses

\*\*\* Significance level=0.01

\*\* Significance level=0.05

\* Significance level=0.1