

# Beyond the first-level digital divide

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# Introduction



## ❑ To start : a digital divide definition

The digital divide is about inequality in the use and access to information technology and communication (ICT) such as mobile phones, computers or Internet.

I'll concentrate on the **Internet** Divide

## ❑ We usually differentiate two types of divide

- ✦ The first level -> refers to access
- ✦ The second level -> refers to usage

# Introduction



- ❑ Most of the digital divide econometric studies concentrate on the first level digital divide. They highlight the main socio-economic explanatory variables.
  
- ❑ There is from these works a consensus concerning the central role of factors including :
  - > residential area, income, education, age, presence of children

(U.S. Department of Commerce (1998 and 1999), Liegh & al. (2001), Stanton (2004), Chaudhuri & al. (2005), Chaudhuri & al. (2007)...) )

# Introduction



My paper is based on two criticals:

- ❑ None of these studies include the dimension related to the will.
  - > They do not differentiate a household which can not have Internet to a household which do not want.
  
- ❑ These studies seem to restrict the fight against digital inequality solely on access
  - > Necessity to analyze the Internet usages

# Introduction



Thus, the goal of my study is to provide two econometric analysis of the digital divide which do not concentrate exclusively on the access **capability** issue.

- ❑ Study 1: I study the Internet home access issue. My contribution is to differentiate the will of the capability.
- ❑ Study 2: I study the diversity of usage among Internet users.

# The data



- ❑ The Data used are from a survey of October 2005 "Information Technology and Communication" (INSEE).
- ❑ It provides data on new technologies access of 5603 households and on the socio-economic variables for the household and its members.
- ❑ Moreover, a thorough analysis was conducted on the use of ICT. To this end, an individual was drawn randomly from each household to participate in this investigation. We thus possess, for one individual of the household, data referring to the opinions, skills and practice on new technologies.



**STUDY 1 :**  
**INTERNET HOME ACCESS**  
**(DIFFERENTIATING THE**  
**WILL OF THE CAPACITY)**

# Study 1: the goal



## ❑ The goal :

- ❑ To explicitly differentiate the will of the capacity (Lenhart and al. (2003) , Van Dijk (2005)).

## ❑ Why :

- ❑ To check whether the determinants usually used to explain the first-level digital divide are still valid when we restrict the sample to the household that wish to have a connection at home
- ❑ To explicitly differentiate the impact of socio-economic factors as we are interesting in the will or the capacity.

# Study 1: the implementation



I estimate a model of sample selection.

The will equation (eq1) :  $W_i^* = X_{1,i}\beta_1 + u_{1,i}$

$W_i = 1$  if and only if  $W_i^* \geq 0$ , et 0 otherwise

The ability equation :  $C_i^* = X_{2,i}\beta_2 + u_{2,i}$

$C_i = 1$  if and only if  $C_i^* \geq 0$ , et 0 otherwise

Sampling Rule :  $\begin{cases} C_i \text{ is observed} & \text{if and only if } V_i = 1 \\ V_i \text{ is observed} & \text{for the overall sample} \end{cases}$

# Study 1 : the explanatory variables



- ❑ Household : income, number of people, presence of child
- ❑ Municipality: degree of urbanization, average income, unemployment rate.
- ❑ Individual : men, diploma, age, opinion on new technologies, social capital.

	eq1	eq2	usual
<b>HOUSEHOLD</b>			
NUMBER OF PEOPLE	0,12**	0,00	0,04
CHILD	0,52*	0,06	0,33*
INCOME (weighted)			
less than 899 euros	-0,69*	-0,72*	-0,85*
from 900 to 1149 euros	-0,44*	-0,58*	-0,64*
from 1150 to 1499 euros	-0,45*	-0,33**	-0,47*
from 1500 to 1999 euros	-0,21**	-0,23**	-0,27*
more than de 2000 euros	ref	ref	ref
MUNICIPALITY			
unemployment > first quartile	0,06	-0,03	-0,00
average income <20 000 euros	-0,05	-0,17**	-0,15**
Degree of urbanization			
low	-0,17**	-0,24**	-0,25*
medium	-0,13**	-0,17**	-0,19*
high	ref	ref	ref
<b>KISH</b>			
MEN	-0,04	0,13**	0,07
STUDENT	1,12**	-0,12***	0,21
OPINION	-0,27*	-0,07	-0,18*
INTERNET ACCESS AT WORK OR AT STUDY PLACE	0,18**	0,19**	0,21*
DIPLOMA			
no diploma	-0,94*	-0,73*	-0,98*
Brevet, CEP ou équivalent	-0,64*	-0,55*	-0,71*
CAP, BEP ou équivalent	-0,46*	-0,54*	-0,59*
Baccalauréat	-0,27**	-0,30**	-0,31*
Premier cycle Univ.	-0,05	0,07	-0,04
Second cycle Univ. ou plus	ref	ref	ref
AGE			
61 years and more	-1,09*	0,03	-0,55*
from 51 to 60 years	-0,56*	0,34**	0,03
from 41 to 50 years	-0,21***	0,39*	0,21**
from 31 to 40 years	-0,30*	0,24**	0,07
30 years and less	ref	ref	ref
SOCIAL CAPITAL			
Active participation in at least one association	0,22*	0,19**	0,23*
Meeting his friends at least once a week	-0,05	0,04	-0,01
$\rho$	0,03		

**Significativity : \* for 1% ; \*\* for 5% ; \*\*\* for 10%**

# Study 1 : the results



- ❑ The main determinants cited in the first-level digital divide - the financial capacity, the residential area, the diplomas - are still significant when it is restricted to the sub-sample of households wishing to have an Internet access at home.
- ❑ However, the failure to take into account the will lead to overestimating the effects of income and degree – for example the coefficient associated with the variables “income less than 899 euros” and “no diploma” are respectively increased by 18% and 34%.
- ❑ Surprisingly, the degree of urbanization and above all the income affect the willingness of households to have Internet. It seems that these variables capture effects other than respectively the availability and the affordability.
- ❑ Age has an antinomic effect. Indeed, to be under 30 years old has a positive impact on the desire to have Internet but negative on the ability.
- ❑ Finally, we can see that the correlation of residuals is not significantly different from zero. Thus, estimating the choice to connect to the Internet using only households composed of at least one person wishing to have Internet at home does not bias the estimates



# **STUDY 2 :**

# **INTERNET USAGE**

# Study 2 : the goal



## □ The goal :

- Analyze the diversity of usage among Internet user (DiMaggio and al. (2001) , (Robinson and al. 2003) )

## □ Why :

- Redefine the purpose of analysis also raises the question of the factors explaining these inequalities. Are they similar to those relating to access?
- A priori not, Leguel and al. (2005) sustain that the home access digital divide stems mainly in the determinants of economic and financial order, while the inequality of uses are strongly determined by non-market interaction and cognitive variables.

## Study 2 : the implementation



- ❑ Among Internet users, I observe if they have used Internet for different tasks (email, research, downloading, administration...) -> 22 tasks
- ❑ I create a polytomic variable which take 10 values  $=\{0,1,2,\dots,9\}$
- ❑ I estimate an ordered probit restricting the sample to the Internet users who have a broadband access at home

## Study 2 : the explanatory variables



❑ Same as before

+ computer skills variables

and

+ experience online variables

	Usages
<b>HOUSEHOLD</b>	
NUMBER OF PEOPLE	-0,11*
CHILD	0,03
INCOME (weighted)	
less than 899 euros	0,19***
from 900 to 1149 euros	0,06
from 1150 to 1499 euros	-0,03
from 1500 to 1999 euros	0,03
more than de 2000 euros	ref
MUNICIPALITY	
unemployment > first quartile	0,04
average income <20 000 euros	-0,01
Degree of urbanization	
Low	-0,00
Medium	-0,01
High	ref
<b>KISH</b>	
MEN	0,13**
STUDENT	-0,06
OPINION	-0,11*
INTERNET ACCESS AT WORK OR AT STUDY PLACE	-0,14**
COMPUTER SKILLS	
L1	-1,90*
L2	-1,33*
L3	-1,18*
L4	-1,10*
L5	-1,07*
L6	-0,62*
L7	-0,48*
L8	ref
ONLINE EXPERIENCE	
less than 1 year	-0,27**
from 1 to 3 years	-0,44*
from 3 to 5 years	-0,23*
more than 5 years	Ref

DIPLOMA		
no diploma		-0,27***
Brevet, CEP ou équivalent		-0,23**
CAP, BEP ou équivalent		-0,14
Baccalauréat		0,00
Premier cycle Univ.		-0,10
Second cycle Univ. ou plus		ref
AGE		
61 years and more		-0,56*
from 51 to 60 years		-0,50*
from 41 to 50 years		-0,40*
from 31 to 40 years		-0,06
30 years and less		ref
SOCIAL CAPITAL		
Active participation in at least one association		-0,07
Meeting his friends at least once a week		0,13**

**Significativity : \* for 1% ; \*\* for 5% ; \*\*\* for 10%**

# Study 2 : the results



- While the first-level digital divide finds its source mainly in geographical and financial determinants, we find that these factors don't influence the diversity of use.<sup>15</sup>
- On the contrary, the inequality of use come essentially from computer capacities , online experience and age variables.
- The variable which has the strongest effect on the diversity of use is the computer skills. For all the skill levels considered there are differences in terms of diversity of use.

<b>computer skill level</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
probability to have at least 10 different usages.	4,7%	13,5%	17,2%	19,3%	20,3%	35,3%	40,2%	59,4%

## Diapositive 19

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j5

dit qu'il n'y a jsute la variable - de 899 euros qui influence et en plus c positif.

joeffrey; 31/01/2009