

# Determinants of Internet Use in Europe

A Micro Data Analysis

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## Background

- ICTs are increasingly influencing every day live
- New way of participation in societal life
- Basic computer and internet skills necessary for active participation
- Risk of exclusion for citizens who do not have access to or use ICTs

# Background

- Renewed Lisbon Strategy of the European Union for economic growth and employment
  
- I2010 strategy as successor to eEurope 2005
  - Comprehensive strategy for the ICT and media sector
  - Single European Information Space
  - Innovation and Investment in ICT research
  - Inclusive European information society
  
- I2010 benchmarking framework (April 2006)
  - Annual European Information Society progress report

## European survey on use of ICTs in households and by individuals

- Indicators on access to ICT (computers, internet) in households
- Indicators on use of computers and internet by individuals
- Specific modules
  - Advanced services (2008)
- Scope
  - Households, Individuals with age 16-74
- Sample size
  - 158000 households, 232000 individuals in 2008

## European survey on use of ICTs in households and by individuals

- Social-demographic background variables
  - Individual
    - Age,
    - Gender,
    - Educational level,
    - Employment situation,
    - Occupation
  - Household
    - Household composition,
    - Household income
    - Region of Residence (NUTS, Degree of urbanisation)
- > 120 collection variables, 11 background variables

# Objectives of the Study

- Feasibility of micro data analysis
- Analyse determinants of internet use
  - Frequency of internet use
  - Downloading of audiovisual content
  - as function of socio-economic background characteristics
- Logistic Regression Models

## Data Availability

- Micro data on use of ICTs in households and by individuals
- 21 countries
  - 19 EU Member States
  - NO, IS
  - Sample size
    - 79000 households
    - 166000 individuals
    - DE, FR, PL, UK, RO missing
    - IT, ES almost half of total population

# Background Characteristics

- Age
  - 6 groups, 16 – 74 years, **reference: 35 – 44**
- Gender, reference: male
- Educational attainment (ISCED)
  - **Low (ISCED0-2) (reference)**
  - Medium(ISCED3-4),
  - High (ISCED 5-6)
- Employment situation
  - **Employee or self-employed (reference)**
  - Unemployed,
  - Student,
  - Not in labour force



# Background Characteristics

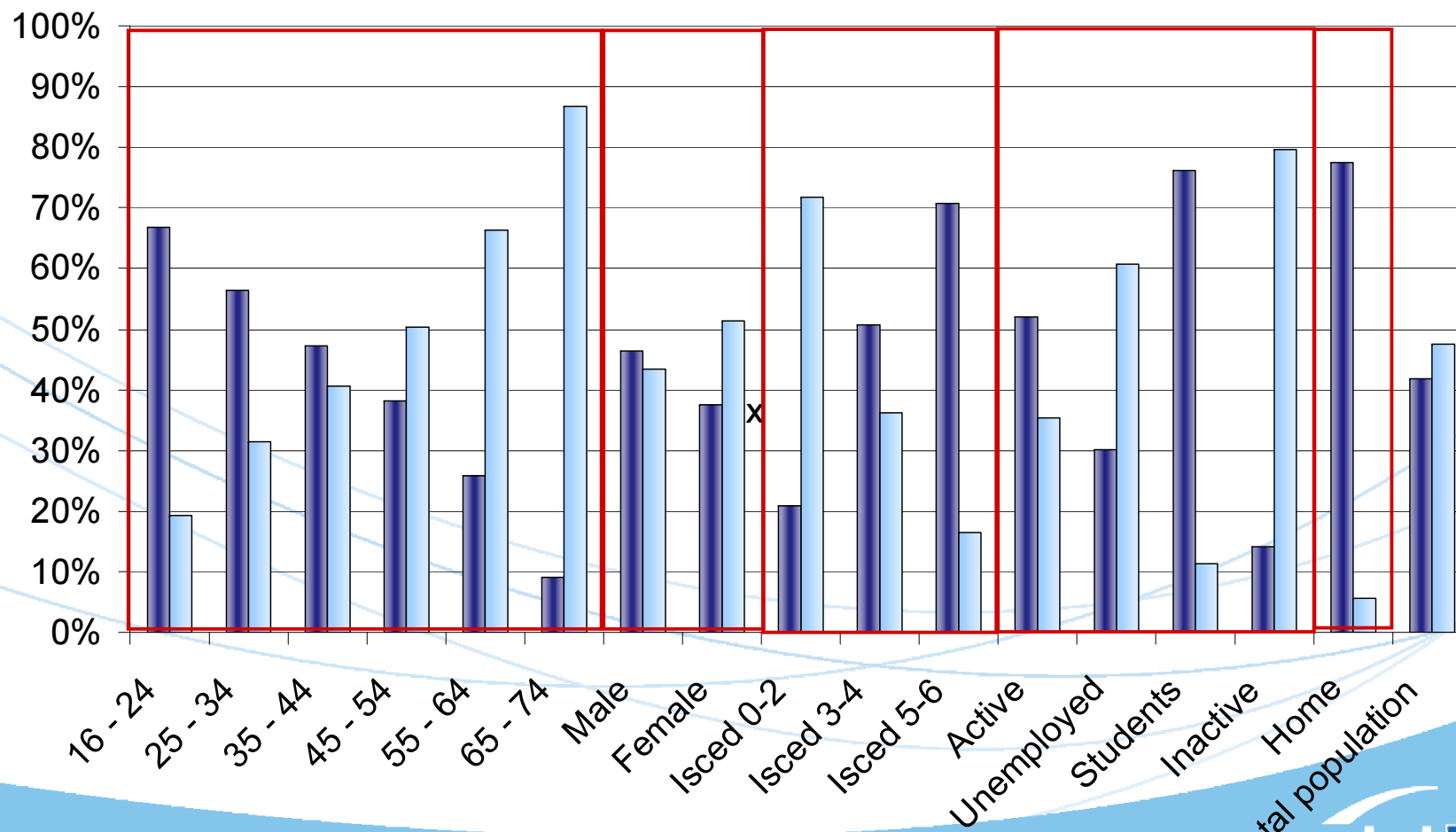
- Degree of urbanisation
  - Densely populated area,
  - Intermediate area,
  - **Thinly populated area (reference)**
- Household composition I
  - Single
    - **without children (reference)**
    - with children
  - 2 adults (without, with children)
  - 3 or more adults (without, with children)
- Household composition II
  - **without children**
  - with children

## Background Characteristics

- Broadband connection
- Used internet at home
- Already paid for audiovisual content
- Mobile phone access to internet
- 3G mobile phone access to internet
- Access to internet with PDA
- Access to internet with portable wirelessly

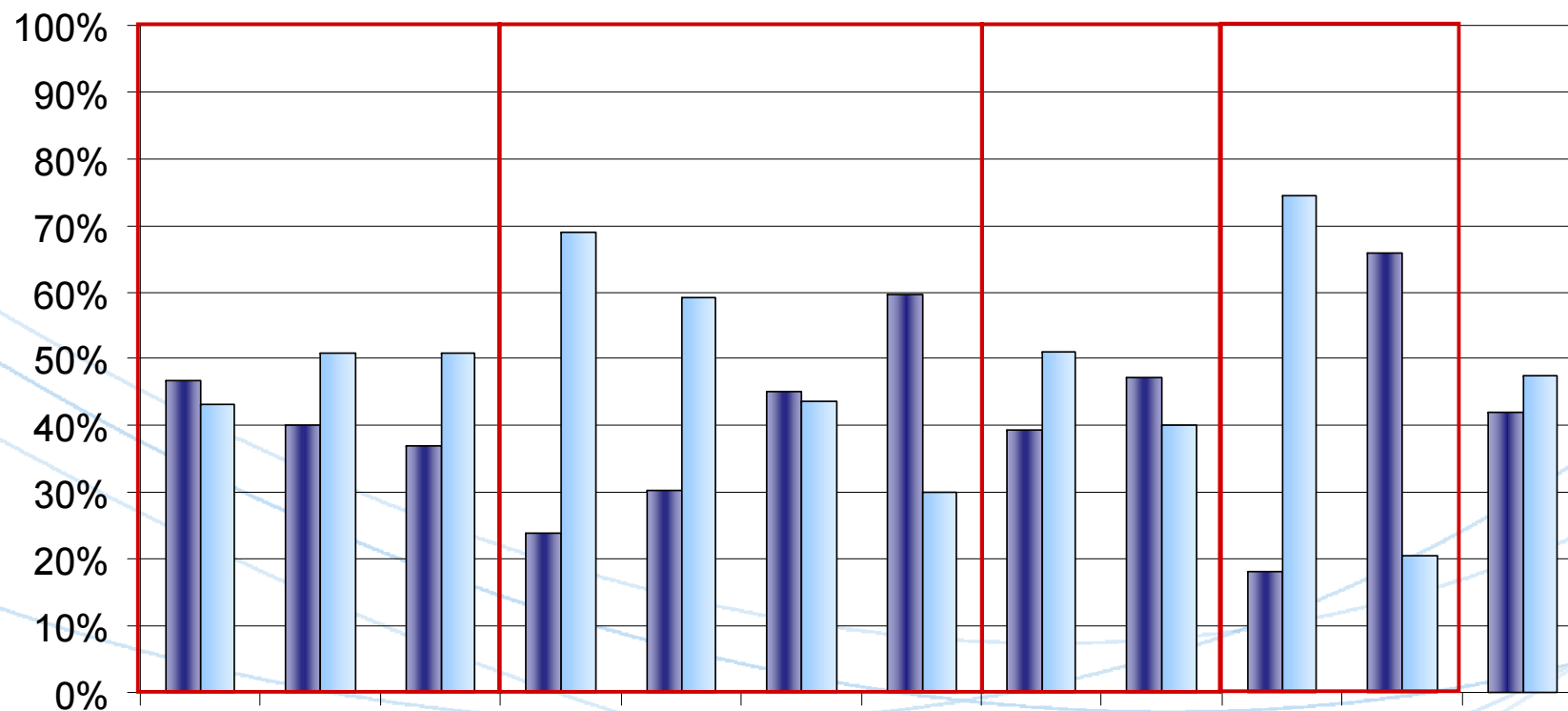
# Internet use: Individuals' Variables

■ Daily ■ Less than weekly or never



# Internet use: Household Variables

■ Daily ■ Less than weekly or never



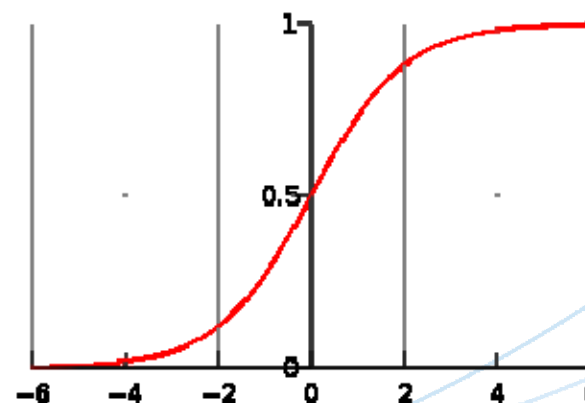
## Preliminary conclusions

Frequency of Internet use dependent on:

- Access at home (Daily: 78% - 9%)
- Employment (Daily: 14% - 76%)
- Age (Daily: 69% - 7%)
- Education (Daily: 21% - 71%)
- Broadband connection (Daily: 18% - 66%)
- Income (Daily: 24% - 60%)
- Urbanisation (Daily: 47% - 37%)
- Presence of children (Daily: 39% - 47%)
- Gender (Daily: 46% - 38%)

# Logistic Regression model

- Estimate probability of occurrence of event with predictor variables
- Logistic function for modelling occurrence of event
- Dependent variable is dichotomous
- Determinants can be continuous or categorical
- Produces relative probabilities for each determinant while controlling for the others



# Logistic Regression model



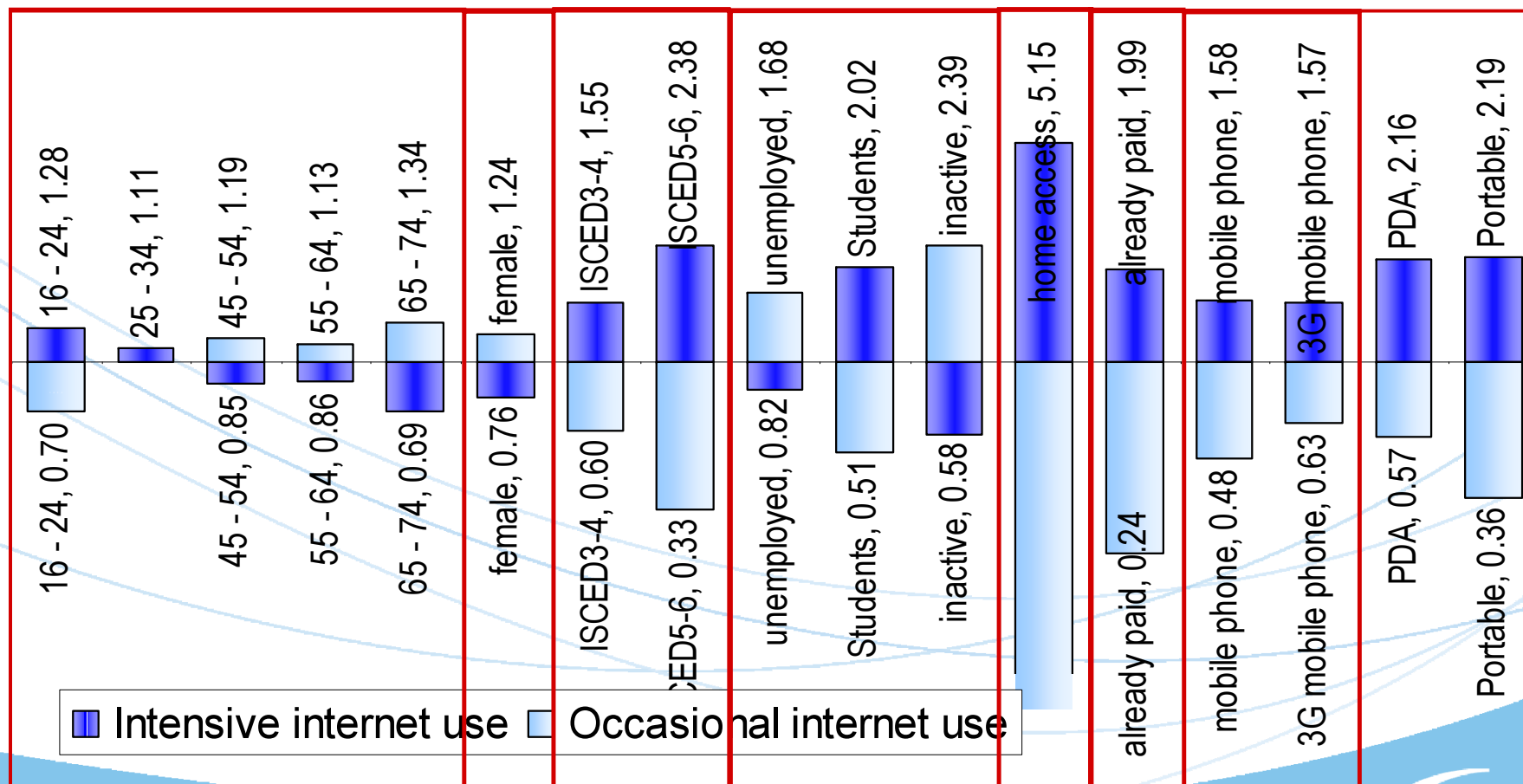
- Probability of success  $p_k(y = 1) = \frac{1}{1 + e^{-z_k}}$

- Logits 
$$z_k = \beta_0 + \sum_{j=1}^J \beta_j \cdot x_{jk} + u_k$$

- Odds 
$$\frac{p(y = 1)}{1 - p(y = 1)} = e^z$$

# Results: Internet Use Frequency

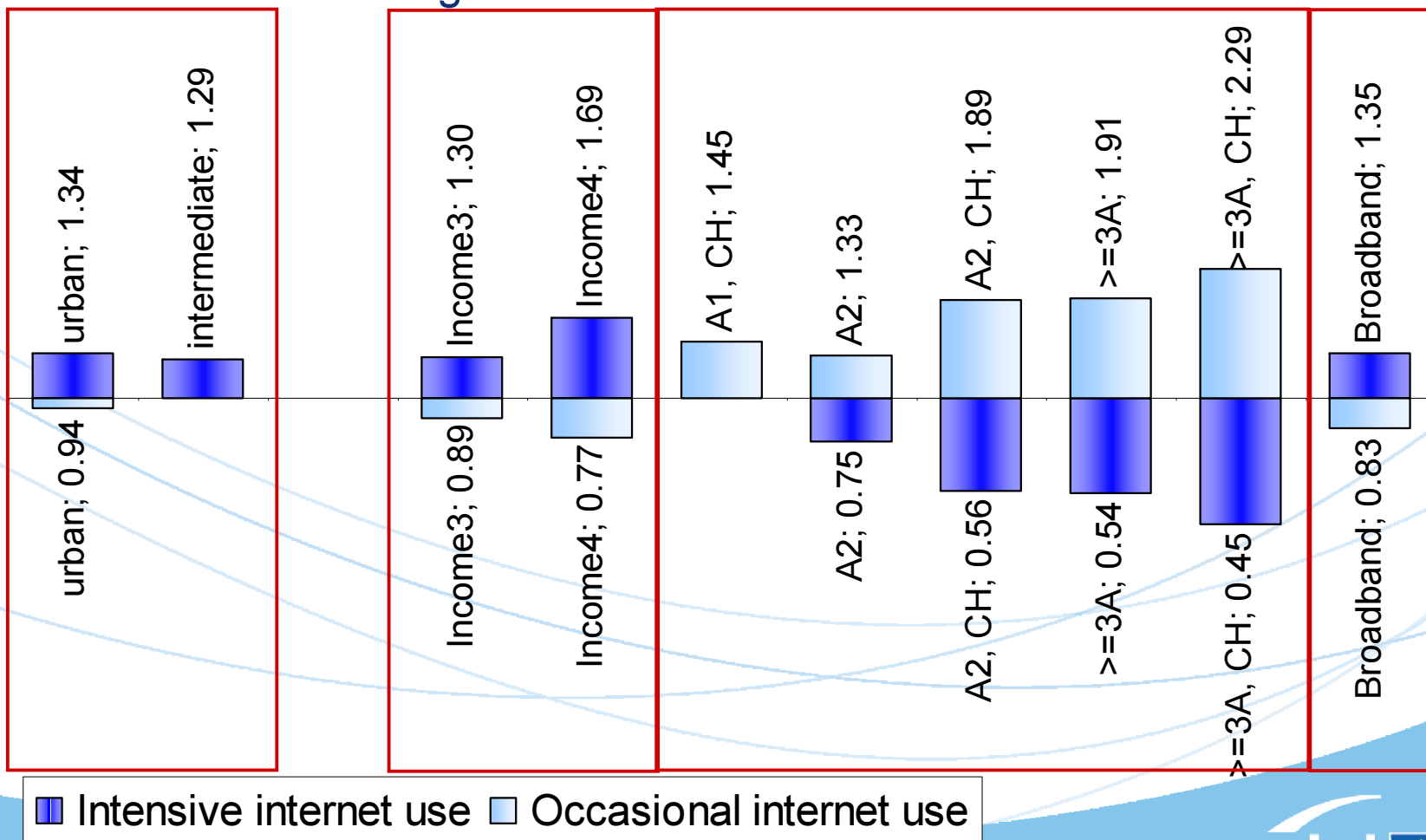
- Individual background characteristics





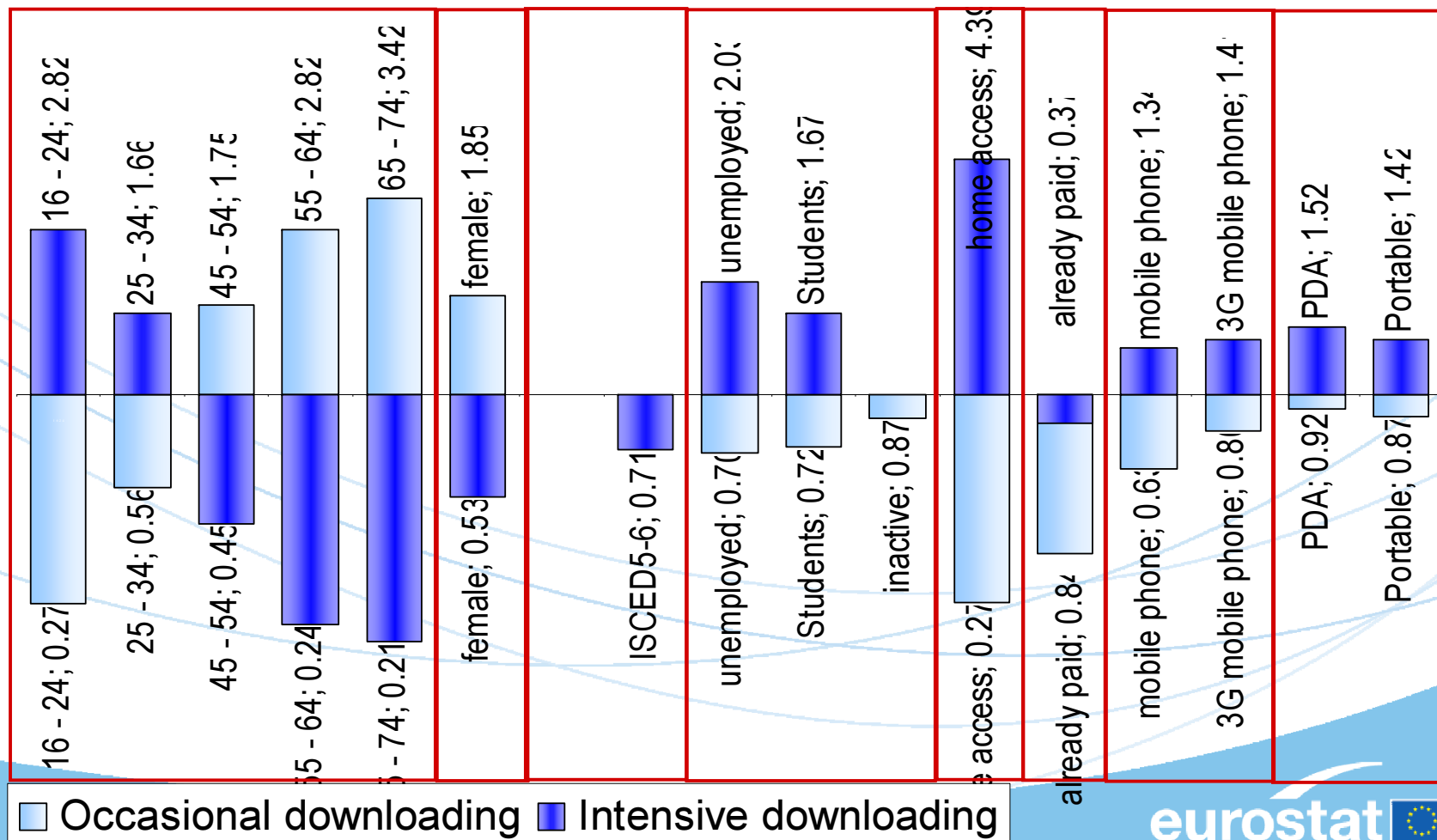
# Results: Internet Use Frequency

## Household background characteristics



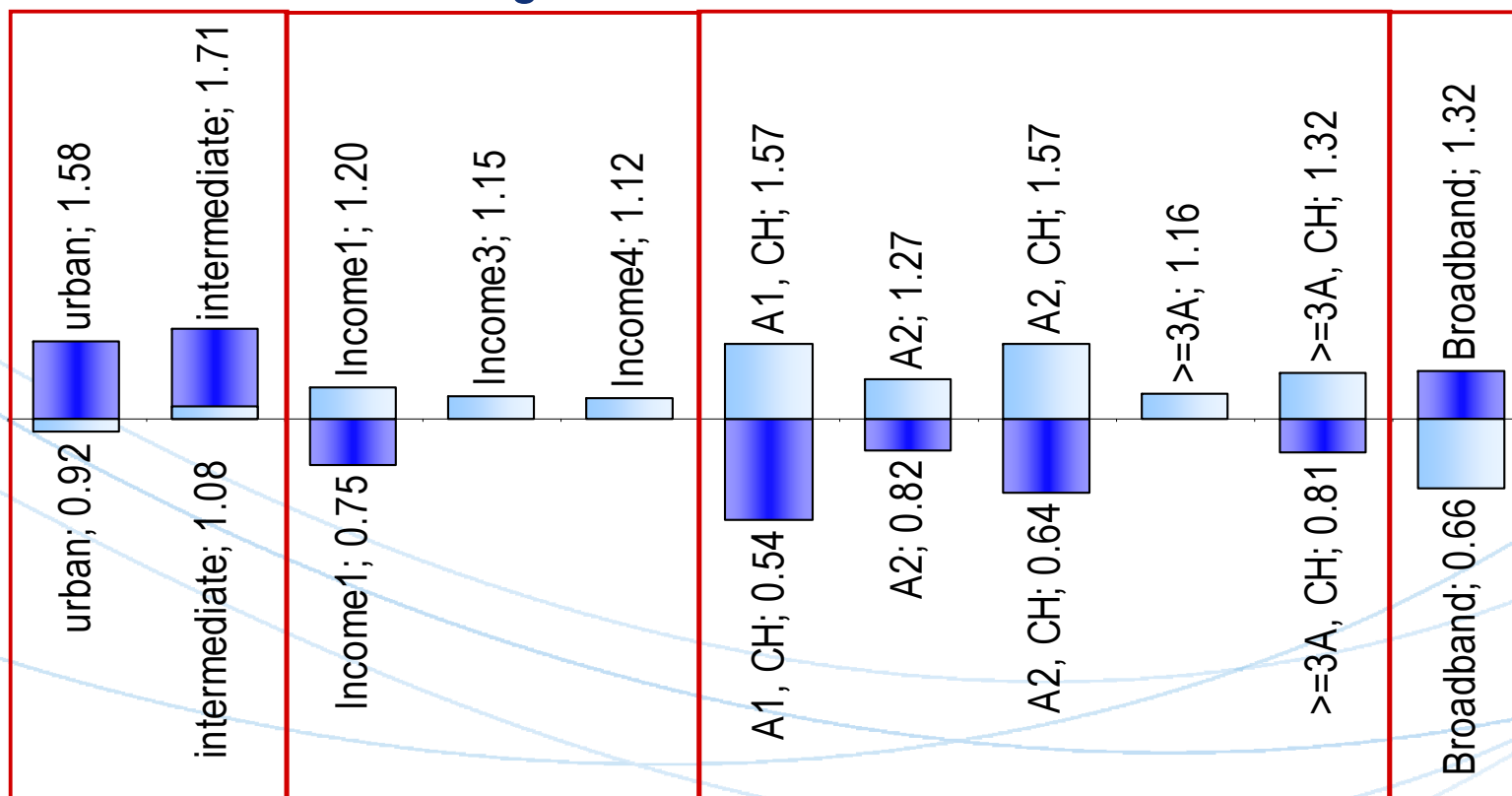
# Results: Audiovisual Download Frequency

- Individual background characteristics



# Results: Audiovisual Download Frequency

## Household background characteristics



■ Intensive downloading ■ Occasional downloading

# Results of Logistic Regression

## Daily internet use

### ■ Positive Factors

- Home access (5.2)
- Tertiary Education (2.4)
- Notebook, PDA (2.2)
- Student (2.0)
- Having paid for audiovisual content (2.0)

### ■ Negative Factors

- > 2 persons and children in household (0.4)
- Unemployed (0.6)
- Age (0.7)
- Gender (0.8)

### ■ No differences between lowest and 2<sup>nd</sup> income quartile

# Results of Logistic Regression by countries

## Daily internet use

- Highest quartile of **household income** have higher propensity in FI, NO
- Differences between odds ratios of **household income** lower in SI
- Quartiles of **household income** lower odds ratios in IT
- **Youngest age group** higher propensity in BE, NO, FI, UK, EE, LV, PT, SE
- **Education** very strong influence in PT (corresponding to high odds ratio of students)
- **Unemployed persons** have higher propensity than reference group in SE
- Differences in propensities according to **employment situation** more distinct in SI
- Differences in propensities according to **degree of urbanisation** more distinct in FI, NO, SE

# Results of Logistic Regression

## Daily downloading of audiovisual content

### ■ Positive Factors

- Home access (4.4)
- Age, young (2.8)
- Student (2.0)
- Unemployed (1.7)
- Intermediate and urban regions (1.7)

### ■ Negative Factors

- Age, high (0.2)
- Gender (0.5)
- Single with children in household (0.5)
- High education (0.7)

### ■ Household income only small influence or is not significant

# Conclusions

- **Micro data analysis is feasible**
  - Logistic regression allows to quantify determinants of internet use and downloading individually
- **Main determinants of daily internet use**
  - + Education
  - + Mobile access / additional devices
  - Many persons in household
  - High age
- **Daily downloading audiovisual content**
  - + Unemployed persons
  - Educational attainment not significant or negative
  - Having already paid for audiovisual content negative
  - ± Age stronger determinant
- **Future**
  - Analysis of digital divide variables (Access to ICTs)
  - Analysis of internet activities
  - Replacement of offline with online activities

# Determinants of Internet Use in Europe

## Thank you for your attention

