Research Seminar

Theme C

Quantitative Data Sources and Statistical Packages

Vítor Escária
(+ Paulo Madruga and Carlos Farinha)

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Goal

Discuss the access to and use of quantitative data and the potentialities of statistical packages when carrying on empirical research.

... based on our own experience

Topics

- Empirical research
- Access/preparation of data
- Data sources
- Statistical packages

Empirical research

- **Definition of a *topic* – based on a theoretical model/ the literature....**
- **Definition of the hypotheses to test – the *thesis***
- ***Access and preparation of data***
  - **Collection o data and data set construction**
  - **Measurement methods and instruments**
- ***Test of hypotheses* – data analysis and model building**
  - **Univariate, bivariate or multivariate analysis**
- **Presentation of results**

Empirical research

- **Empirical research is subsidiary to an *idea*, is carried out to answer a question, which is the centre of the thesis**
  - **We don’t carry on empirical research just to do empirical research**
- **Empirical research enables to test whether an idea is true, to answer a concrete question**
  - **The increase of minimum pensions helps to reduce poverty?**
  - **A marketing campaign raises the number of consumers of a given product?**
  - **The action of the central bank reduces de cost of funding for companies?**

Access/Data preparation

- **Secondary information – produced by entities of the Statistical System/ other entities**

- **Primary information – direct collection**
  - **Enquiries**
  - **Case studies**

Data access: Most common sources of secondary statistical information

- **Statistical entities**
  - **National:**
    - **INE, Bank of Portugal, DGO, etc...**
  - **Internacional**
    - **Eurostat, ECB, European Commission, OECD, United Nations, World Bank, IMF, WTO, ILO, etc...**
- **Other**
  - **Datastream, Bloomberg, Reuters, Dun & Bradstreet**

Data access

Secondary data from statistical sources

- **Some checks:**
  - **metadata**
  - **statistical classifications**
  - **goals and data to use – issues:**
    - different sources for the same variable
    - original *vs* normalised values
    - international comparisons
    - breaks in series

Data access

Direct collection/ Enquiries

- **Some checks:**
  - population and sample selection
  - enquiry methodology
  - pilot enquiry and simulation of analysis
  - type of questions: open vs closed
  - answers coding
  - closed questions: measurement scales
  - monetary and time costs to apply an enquiry

Types of Data

- With respect to the temporal dimension/units observed
  - Time series
  - Cross sections
  - Panels
- With respect to the type of statistical unit
  - Microdata
  - Aggregate data

Data analysis and model building

Types of analysis

- **Static analysis**
  - One observation point
- **Comparative statics**
  - Two observation points – two independent observations
- **Dynamic analysis**
  - More than one observation point and ability to measure flows

Statistical packages

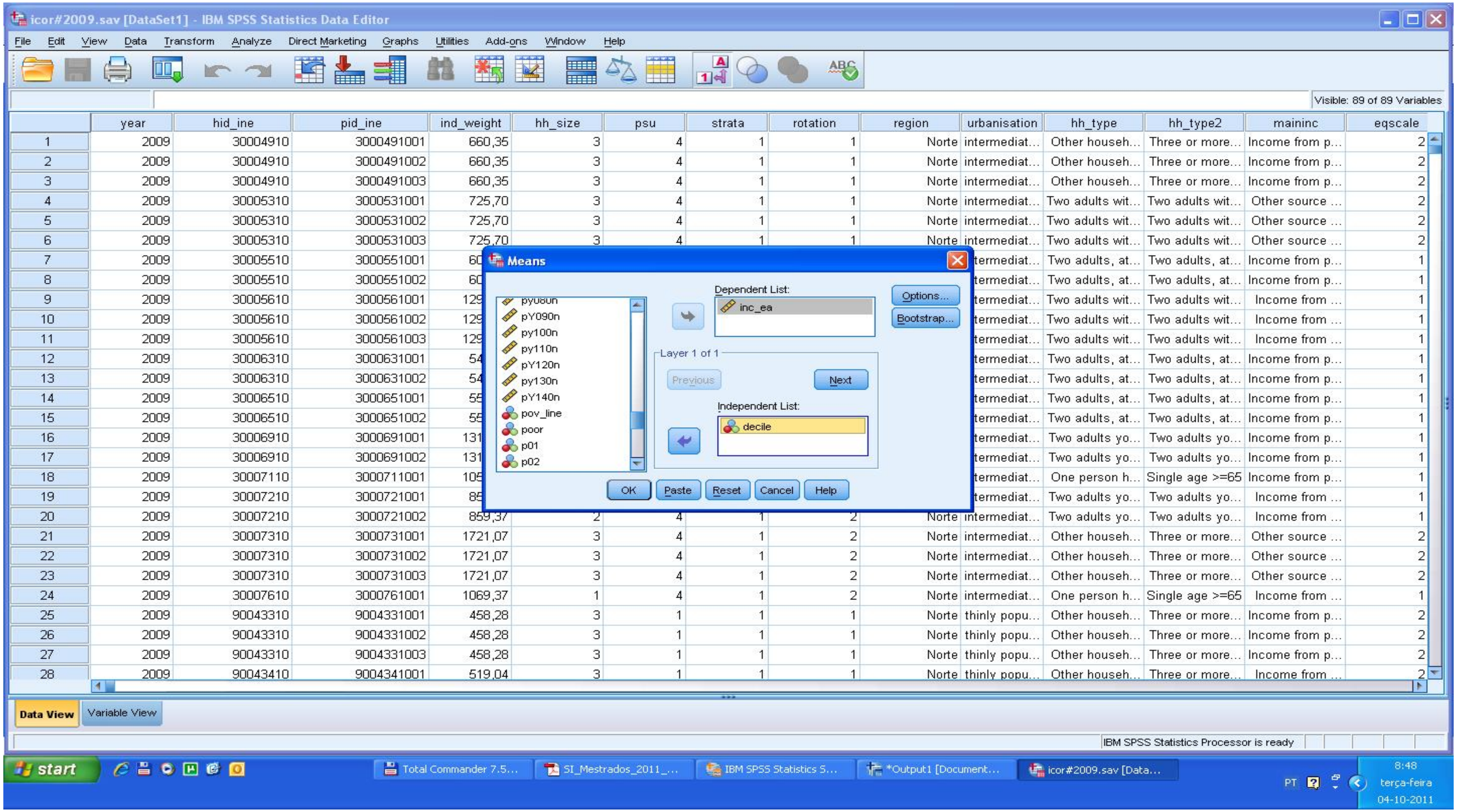
- **The choice of the package**
  - **Depends on the work to carry on and on the structure of the data**
  - **Three levels:**
    - **Excel**
    - **PASW (ex-SPSS), Stata, SAS, TSP, EViews...**
    - **Gauss**

For a discussion on the levels of popularity of the different statistical packages check: The Popularity of Data Analysis Software by Robert A. Muenchen (http://r4stats.com/popularity)

Statistical packages

- Work with SPSS/STATA/SAS
  - All have an user interface based in a system of menus, a data sheet and an output window
  - Most have another interface that enable the user to write and run procedures using commands
    - Many of the most powerful commands are only available this way
    - Usually there is some possibility of interaction between the menu system and the programming interface – allows to use the menus to create command lines

Statistical packages



icor#2009.sav [DataSet1] - IBM SPSS Statistics Data Editor

Visible: 89 of 89 Variables

	year	hid_ine	pid_ine	ind_weight	hh_size	psu	strata	rotation	region	urbanisation	hh_type	hh_type2	maininc	eqscale
1	2009	30004910	3000491001	660,35	3	4	1	1	Norte	intermediat...	Other househ...	Three or more...	Income from p...	2
2	2009	30004910	3000491002	660,35	3	4	1	1	Norte	intermediat...	Other househ...	Three or more...	Income from p...	2
3	2009	30004910	3000491003	660,35	3	4	1	1	Norte	intermediat...	Other househ...	Three or more...	Income from p...	2
4	2009	30005310	3000531001	725,70	3	4	1	1	Norte	intermediat...	Two adults wit...	Two adults wit...	Other source ...	2
5	2009	30005310	3000531002	725,70	3	4	1	1	Norte	intermediat...	Two adults wit...	Two adults wit...	Other source ...	2
6	2009	30005310	3000531003	725,70	3	4	1	1	Norte	intermediat...	Two adults wit...	Two adults wit...	Other source ...	2
7	2009	30005510	3000551001	60						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
8	2009	30005510	3000551002	60						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
9	2009	30005610	3000561001	129						termediat...	Two adults wit...	Two adults wit...	Income from ...	1
10	2009	30005610	3000561002	129						termediat...	Two adults wit...	Two adults wit...	Income from ...	1
11	2009	30005610	3000561003	129						termediat...	Two adults wit...	Two adults wit...	Income from ...	1
12	2009	30006310	3000631001	54						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
13	2009	30006310	3000631002	54						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
14	2009	30006510	3000651001	55						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
15	2009	30006510	3000651002	55						termediat...	Two adults, at...	Two adults, at...	Income from p...	1
16	2009	30006910	3000691001	131						termediat...	Two adults yo...	Two adults yo...	Income from p...	1
17	2009	30006910	3000691002	131						termediat...	Two adults yo...	Two adults yo...	Income from p...	1
18	2009	30007110	3000711001	105						termediat...	One person h...	Single age >=65	Income from p...	1
19	2009	30007210	3000721001	85						termediat...	Two adults yo...	Two adults yo...	Income from ...	1
20	2009	30007210	3000721002	859,37	2	4	1	2	Norte	intermediat...	Two adults yo...	Two adults yo...	Income from ...	1
21	2009	30007310	3000731001	1721,07	3	4	1	2	Norte	intermediat...	Other househ...	Three or more...	Other source ...	2
22	2009	30007310	3000731002	1721,07	3	4	1	2	Norte	intermediat...	Other househ...	Three or more...	Other source ...	2
23	2009	30007310	3000731003	1721,07	3	4	1	2	Norte	intermediat...	Other househ...	Three or more...	Other source ...	2
24	2009	30007610	3000761001	1069,37	1	4	1	2	Norte	intermediat...	One person h...	Single age >=65	Income from ...	1
25	2009	90043310	9004331001	458,28	3	1	1	1	Norte	thinly popu...	Other househ...	Three or more...	Income from p...	2
26	2009	90043310	9004331002	458,28	3	1	1	1	Norte	thinly popu...	Other househ...	Three or more...	Income from p...	2
27	2009	90043310	9004331003	458,28	3	1	1	1	Norte	thinly popu...	Other househ...	Three or more...	Income from p...	2
28	2009	90043410	9004341001	519,04	3	1	1	1	Norte	thinly popu...	Other househ...	Three or more...	Income from ...	2

Means

pyu8un
pY090n
py100n
py110n
pY120n
py130n
pY140n
pov_line
poor
p01
p02

Dependent List: inc_ea

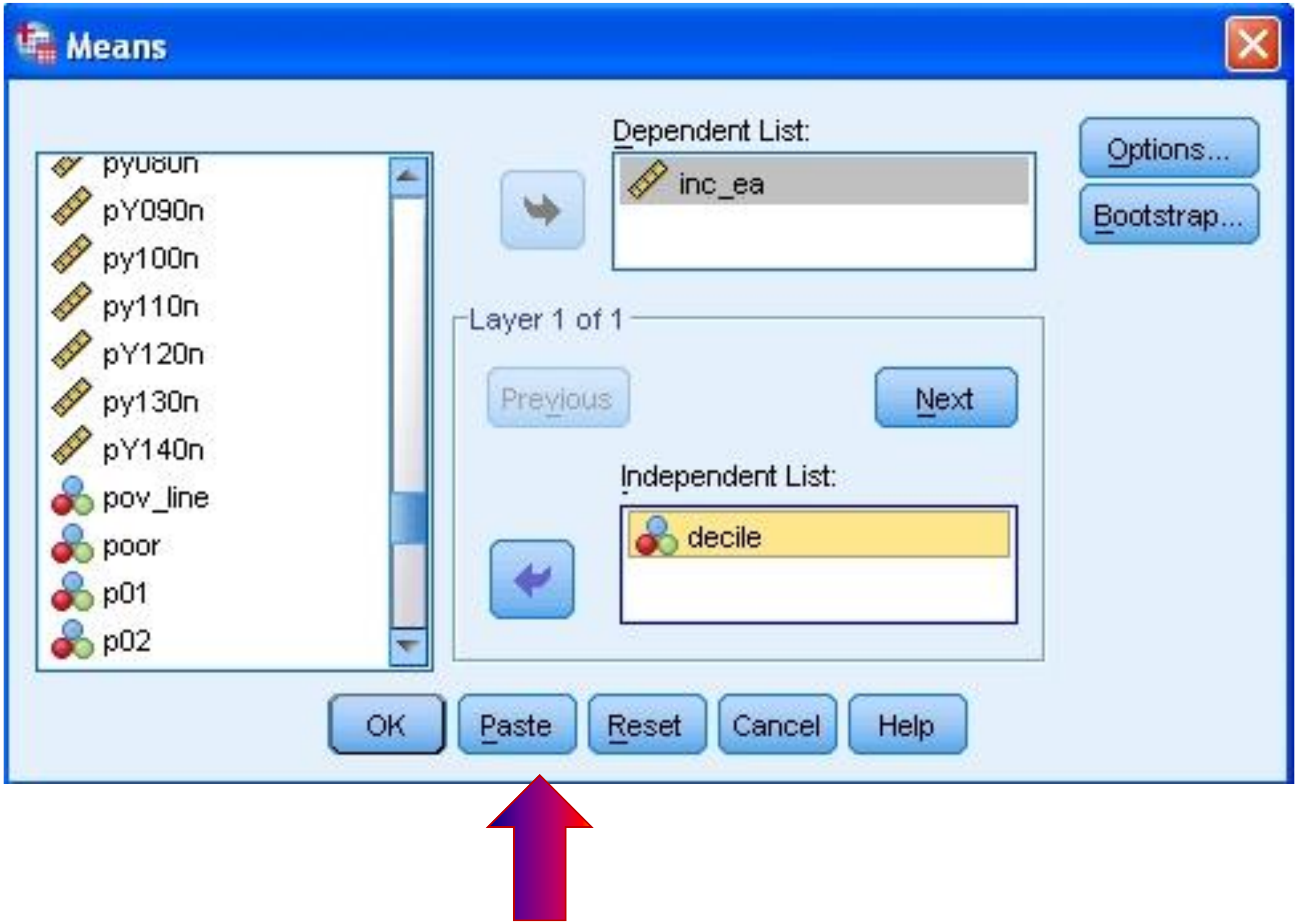
Layer 1 of 1

Independent List: decile

IBM SPSS Statistics Processor is ready

8:48
terça-feira
04-10-2011

Statistical packages

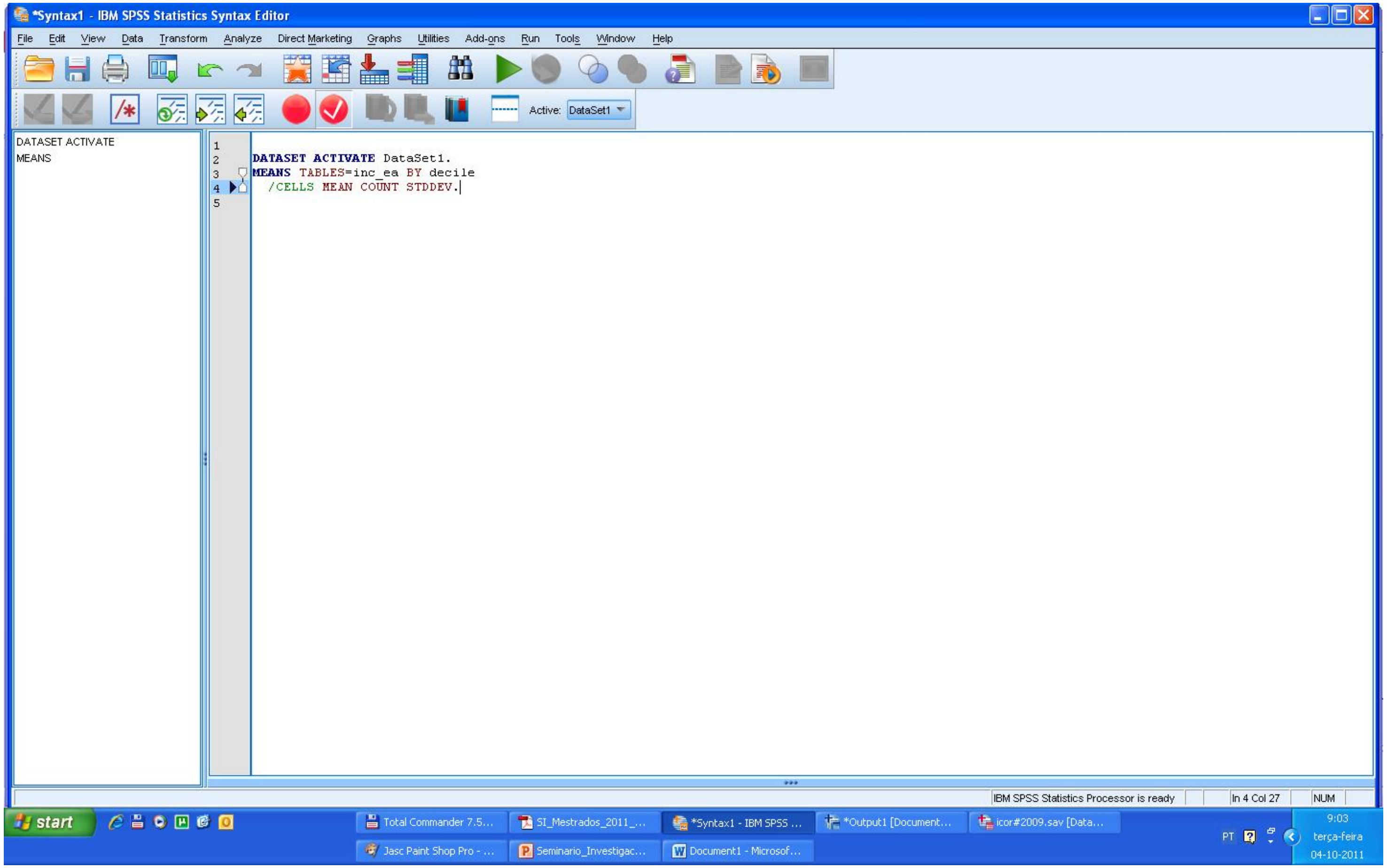


Dependent List: inc_ea

Layer 1 of 1

Independent List: decile

Statistical packages



```
DATASET ACTIVATE DataSet1.
MEANS TABLES=inc_ea BY decile
  /CELLS MEAN COUNT STDDEV.
```

IBM SPSS Statistics Processor is ready | In 4 Col 27 | NUM

Statistical packages

```
SET  printback=listing messages=listing.
Title     '****                 rsi_model_09#001                ****'.
* **************************************************************************************************************.
* rsi_model_09#001:
*.
*    Simulation of RSI based on SILC 2009
*.
*    Builds the individual datafile from silc files
*.
* **************************************************************************************************************.
* @cfr2011 - version 24-09-2011
** **************************************************************************************************************.
DATASET CLOSE ALL.
GET FILE='c:\temp\icor2009r.sav'/KEEP hid_ine pid_ine rb010 rb030 rb050 rb080 rb090 rb220 rb230 rb240.
DATASET NAME DataSet1 WINDOW=FRONT.

IF (rb080 ne rb010)age=(rb010-1)-rb080.
IF (rb080 eq rb010)age=0.
FORMATS age (f3.0).
VARIABLE LABELS age 'Age at the end of the income reference period'.
EXECUTE.

Rename vars (rb010 rb030 rb050 rb090 rb220 rb230 rb240 = year pid ind_weight sex pid_father pid_mother
pid_partner).
execute.
compute hid = trunc(pid/100).
variable label hid 'Household ID'.
execute.
```

Statistical packages

- **Advantages in using syntax files**
  - Once the language is known it saves a lot of time – it is easier to change some bits of the program and run it again than to repeat all the steps
  - The programme allows to understand the research strategy and options made when dealing with data or model problems
  - The same programme may be used in different projects

NOTE: It is possible to find many procedures available on line

Statistics Sources

- **Free access**
  - **Portal INE**
  - **Portal Bank of Portugal (BPSTAT, etc)**
  - **Portal Eurostat**
  - **European Commission: DG ECFIN (AMECO, KLEMS, BACH, …)**
  - **Portal OECD**
  - **WTO (World Trade)**
  - **IMF, World Bank, etc**
  - **CMVM/Euronext**

Statistics Sources

- **Available in ISEG terminals**
  - **Datastream**
  - **BANKSCOPE – information on over 23,000 banks**
  - **CHELEM – world trade, macroeconomic data and balance of payments**
  - **OSIRIS – Information on listed companies**

Statistics Sources

- **Available for research (protocol)**
  - **Protocol ex-MCTES/INE – access to microdata**

NOTE:

To access data it takes time: contracts / protocols / waiting time…=>

Need to consider this at an early stage of the research.

Statistics Sources

- Some rules when dealing with data (especially confidential data)
  - Limit the use of data to the goal agreed
  - Always refer who has made the data available (and the version that is being used)
  - Do not use data for commercial or other non agreed uses
  - Respect the rules of confidentiality and anonimization
  - Destroy data in the end of the period agreed