

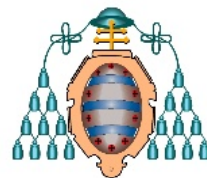


EXPLORING EDUCATIONAL ECONOMETRIC SOFTWARE: A DECADE OF EXPERIENCES WITH GRETLE

Ana Jesús López (anai@uniovi.es)

Rigoberto Pérez (rigo@uniovi.es)

University of Oviedo (Spain)



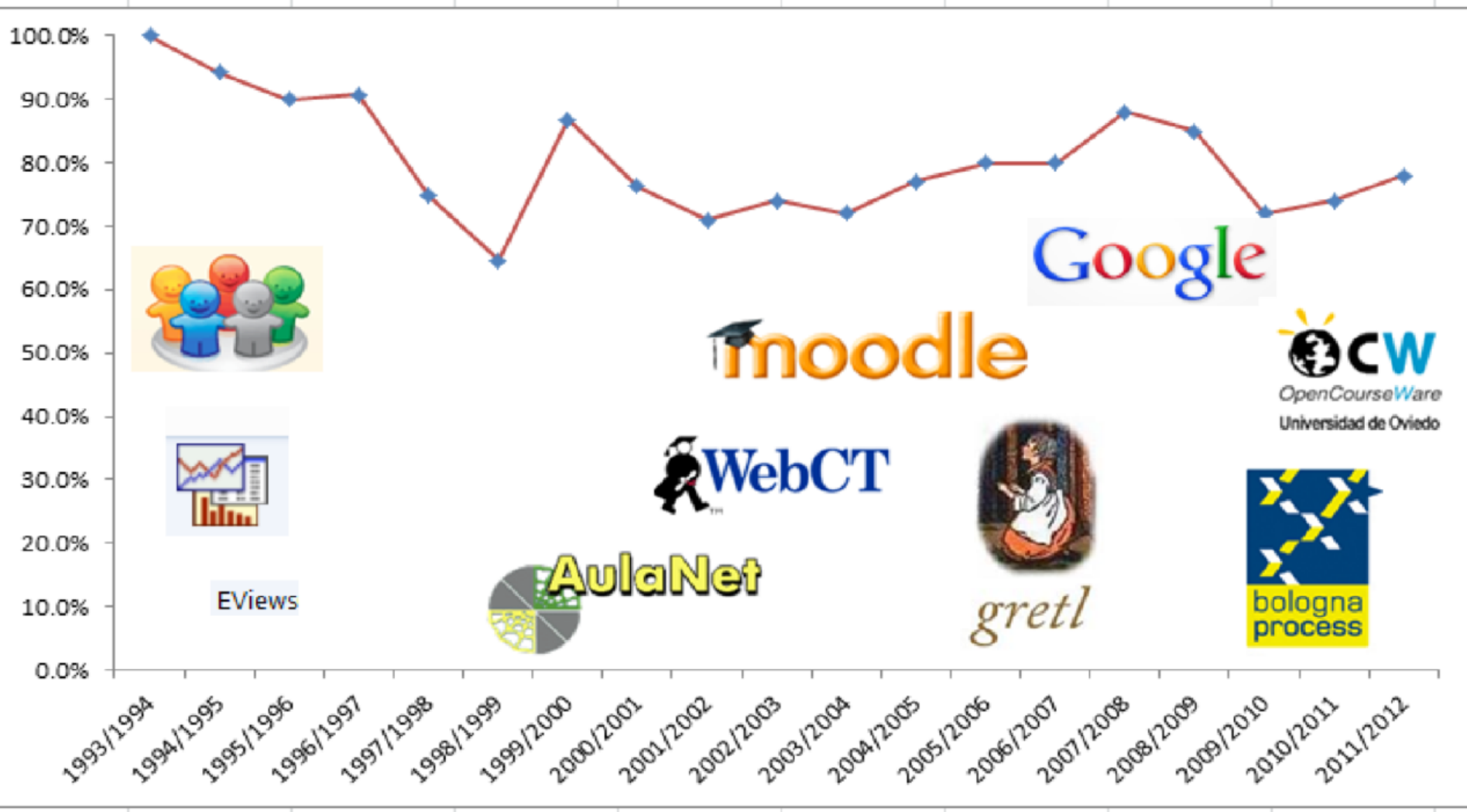
UNIVERSIDAD DE OVIEDO



INDEX OF CONTENTS

- Assessing Educational Software
- The Four-F Test
- Some Objective Evidence
- Online Surveys
- Testing Results
- Concluding Remarks

Assessing Educational Software



Assessing Educational Software

The Four-F test

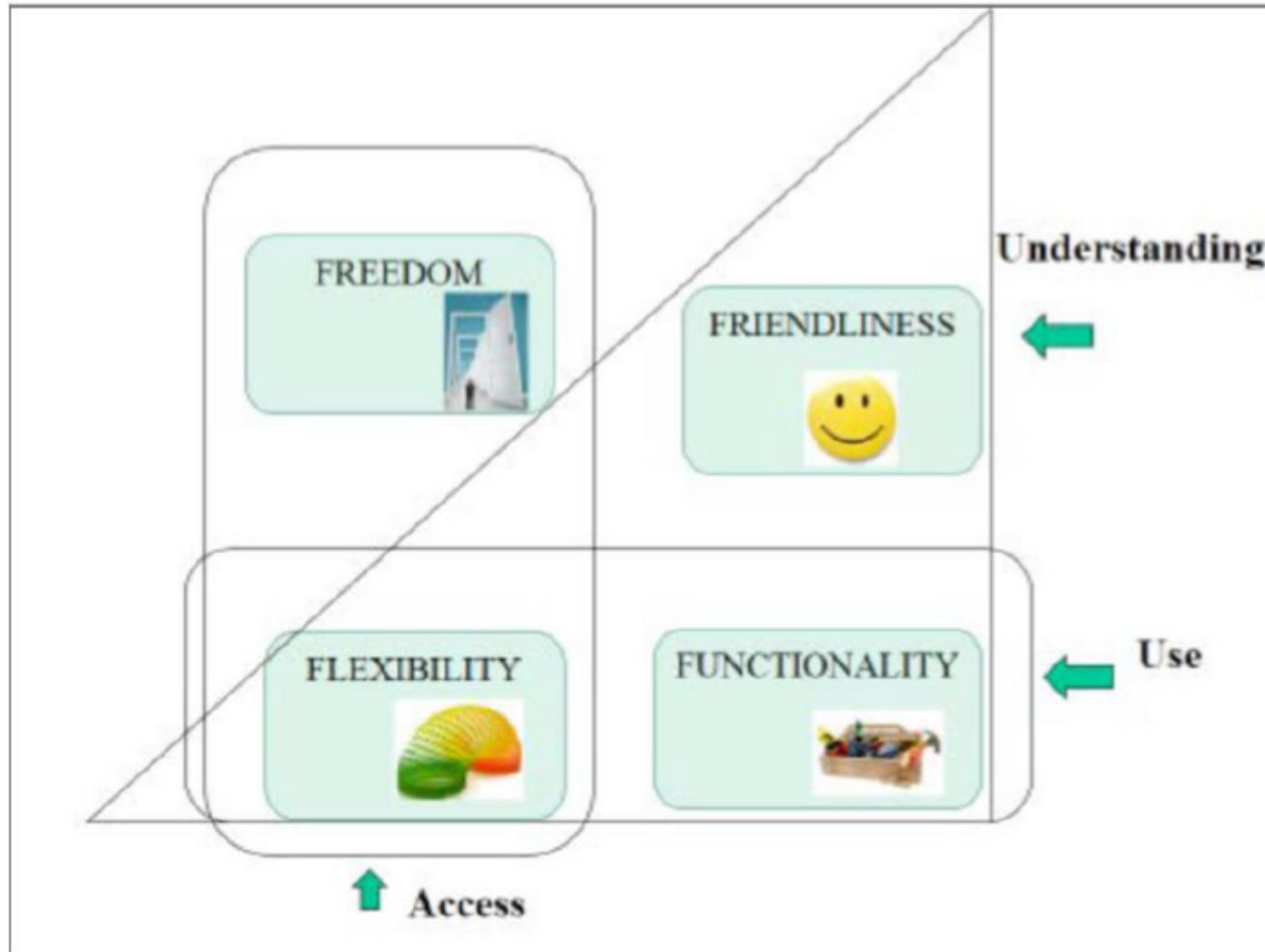


Figure 1: The Four-F test

The Four F Test

HYPOTHESIS

REQUIREMENTS

FREEDOM

Openness: Free-Open Source Software (FOSS)

FLEXIBILITY

Available in different languages and platforms
Supporting different data formats
Suitable for different potential users

FUNCTIONALITY

Providing a wide range of operations
Interacting with different statistical software
Allowing different levels of use
Providing functional output

FRIENDLINESS

Intuitive and Friendly interface
Understanding facilitation through graphs,
tables, database, ...
Learning materials available

Assessing Educational Software: Freedom



EUROPEAN HIGHER EDUCATION AREA (EHEA)

FREE OPEN SOURCE SOFTWARE (FOSS)

Student centered teaching-learning process

User / Customer centered development

Educative model based on the achievement of Competences (creativity, learning capacity, problem solving, team work,...)

Free, democratic, sustainable and technologically competitive educative model

University networks, Coopetition

Coopetition understood as improvement and evolution

EDUCATIONAL ADVANTAGES OF FOSS (CENATIC)

1. Contributes to educate free, independent, critic and autonomous people.
2. Allows the use of educational tools adapted to students
3. Creates a community of shared knowledge
4. Facilitates the free election of technology
5. Changes rapidly, helping to efficiently solve problems
6. Success stories in the Spanish educational framework
7. Allows Costs savings
8. Provides students with the same educational tools at school and at home, 100% legally
9. Guarantees security
10. Facilitates the innovation of products and services

EHEA COMPETENCES

Creativity

Critical and self-critical capability

Learning capability

Problem Solving

Ethic compromise

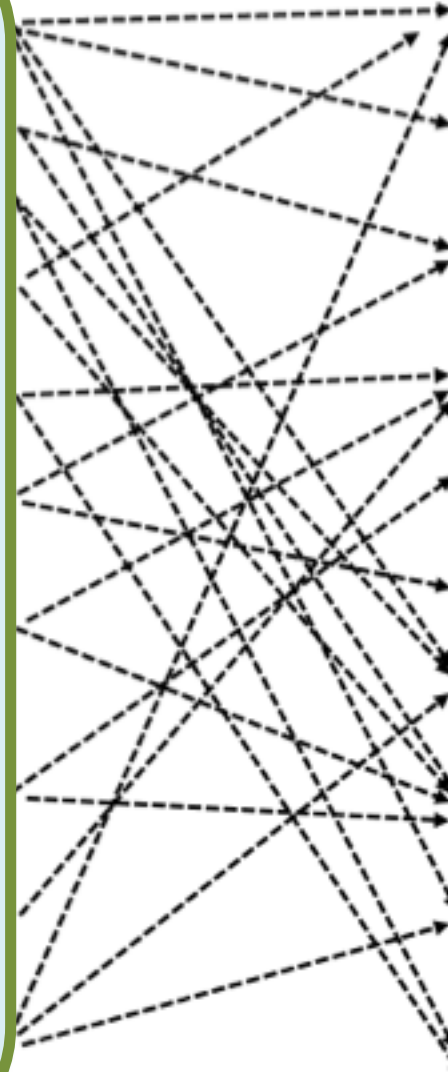
Analysis and synthesis

Capability for Teamwork

Adaptability

Capability for working autonomously

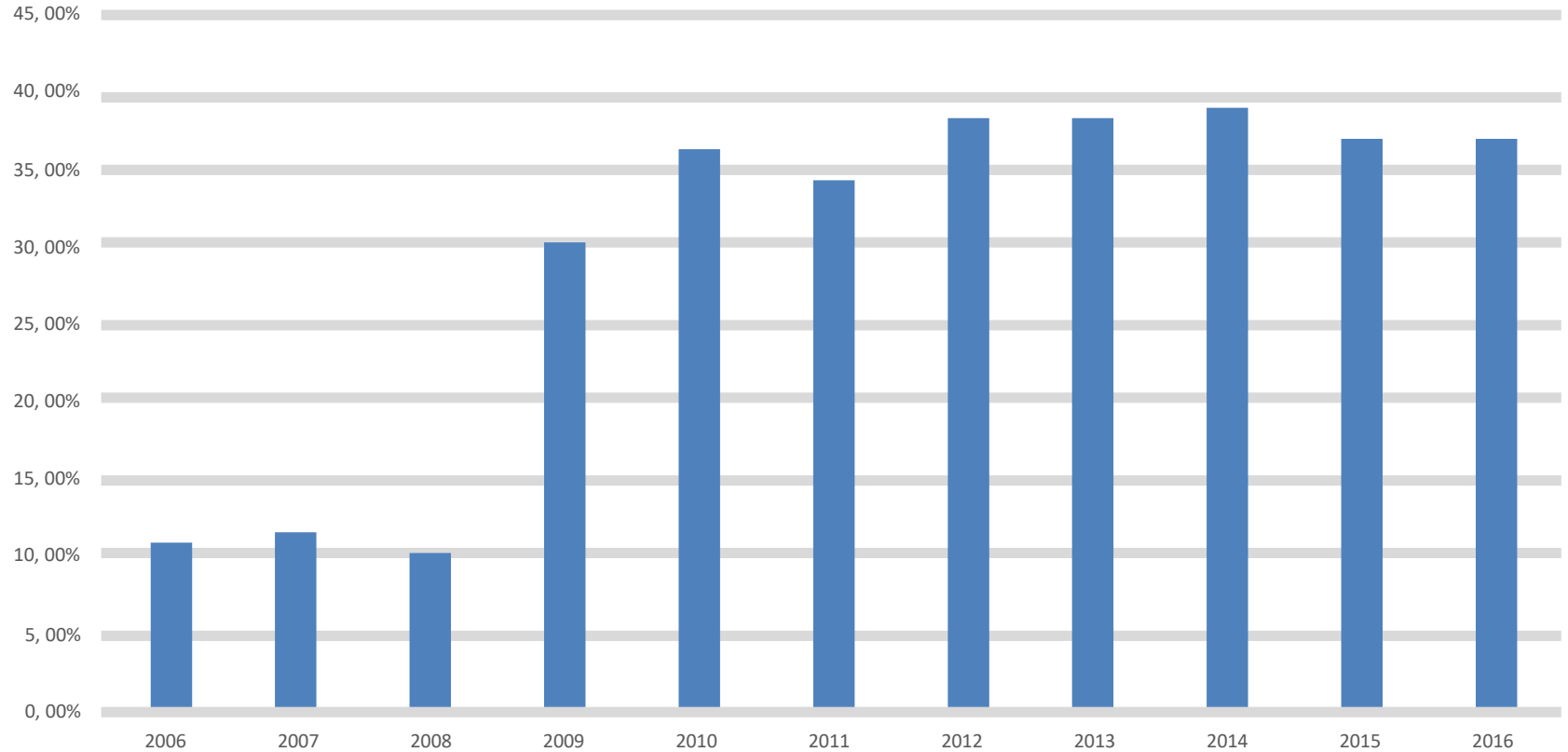
Knowledge updating



FOSS Penetration in Spanish Universities

INDICATOR	CONTENT
Information Society Index and Free Software Index (CENATIC)	<p>Economic, socio-academic, technologic and political dimensions are considered.</p> <p>Socio-academic indicators include, among others, the participation in the open source community, the availability and distribution of GNU/Linux and Mozilla in native language, the knowledge level of Open Source software, and the ratio of Linux users.</p>
ICT Development Index -IDI (ITU)	<p>A total of 11 indicators are included, corresponding to 5 access indicators (weighting 40%), 3 usage indicators (weighting 40%) and 3 ability indicators (weighting 20%)</p>
Spanish UniversiTIC Indicators (CRUE)	<p>Access indicators (percentage of FOSS computers in classrooms, %) and Usage indicators (percentage of free software products, %).</p>

FOSS Penetration in Spanish Universities

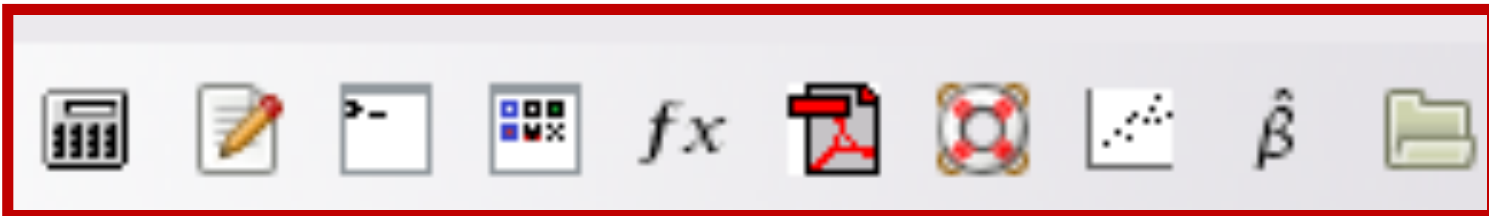


Four-F Test: Objective Evidence

Requirement	Evidences
Freedom	Open-source statistical software Developed in Linux. Available on Microsoft Windows and Mac OS X
Flexibility	Available in several languages (English French, Italian, Spanish, Polish, German, Basque, Catalan, Galician, Portuguese, Russian, Turkish, Czech, Traditional Chinese, Albanian, Bulgarian and Greek) Wide variety of supported data formats Tailored for a wide variety of potential users
Functionality	Command Line Interface and Gretl Console Integrated powerful scripting language Import data from several file formats Interaction with R Output models as LaTeX files, in tabular or equation format Command loop structure for simulations and iterative estimation procedures User's Guide available
Friendliness	Intuitive and Friendly interface Graphs and Icons facilities Large database and textbooks available

Four-F Test: Objective Evidence

- **Easy intuitive interface**
- **Wide variety of options**
- **Flexible, allowing different ways of working from interactive point-and-click to batch processing.**
- **Often update**
- **Suitable for face-to face, blended learning and e-learning**



Four-F Test: Subjective Evidence

Online Surveys

Course	Description	Method	Gretl Use
Statistical and Econometric Methods	Compulsory, Second year, Degree in Economics	Blended Learning	Computer sessions Team Project
Econometrics	Compulsory, Third year, Degree in Economics	Blended Learning	Computer sessions Team Project
Economic Forecasting	Optional, Fourth year, Degree in Economics	Blended Learning	Computer sessions Personal Project
Forecasting for Business and Economics	Optional, Free-election course for different degrees of nine Spanish Universities (G9 Virtual Network)	E-Learning (G9 Shared Virtual Campus)	Online Materials Online Questionnaires
Time Series, Applied Econometrics	Master and Doctorate Courses, Economics and Finance (Universities of Oviedo and Leon)	Face to face	Practical Sessions Personal Project



Statistical and Econometric Methods



About Gretl



[Gretl website](#)



[FAQ about Gretl](#)



[Gretl Forum](#)



[Gretl short guide](#)



[Gretl User's Guide](#)



[Data files 2012-2013](#)



[Data files](#)



[Gretl Functions](#)



[Practice 1. Introduction to Gretl](#)



[Practice 2. Probability](#)



[Practices 3&4. Probability models and CLT](#)



[Practice 5. Samples and estimators](#)



[Practice 10: Wages](#)



[Table](#)



[Wages](#)



[Wages: Worked solution in Spanish](#)



[Practice 11: Productivity](#)



[Practice 12: Migrations](#)



[Practice 13: Campsoil](#)



[Worked solution](#)

Consumption

Learning objectives:

After solving this exercise students should be able to:

- Access statistical information on the National Statistics Institute (INE) website
- Import series from a spreadsheet into Gretl
- Carry out a joint analysis of Income and Consumption, using time series graphs and scatter plots
- Obtain an OLS estimation of the Consumption and provide an interpretation for the coefficients
- Analyse residuals tables and plots
- Test the significance of Income as an explanatory variable of Consumption
- Add new observations to an existing workfile.
- Compare alternative Consumption models.

Estimated time for this practice: 1,5 hours

Practice

The Spanish National Statistics Institute (www.ine.es) publishes National Accounts including the main Spanish macro-magnitudes (downloadable in spreadsheet format).

Consider the following information referred to Household Consumption Expenditure (consumption) and Net Disposable Income (income), expressed in billion euros:

Using Gretl in Statistical and Econometric Methods

Continuous assessment and Team project



Continuous assessment activities score

NEW



Team Project Score

NEW

Gretl Functions

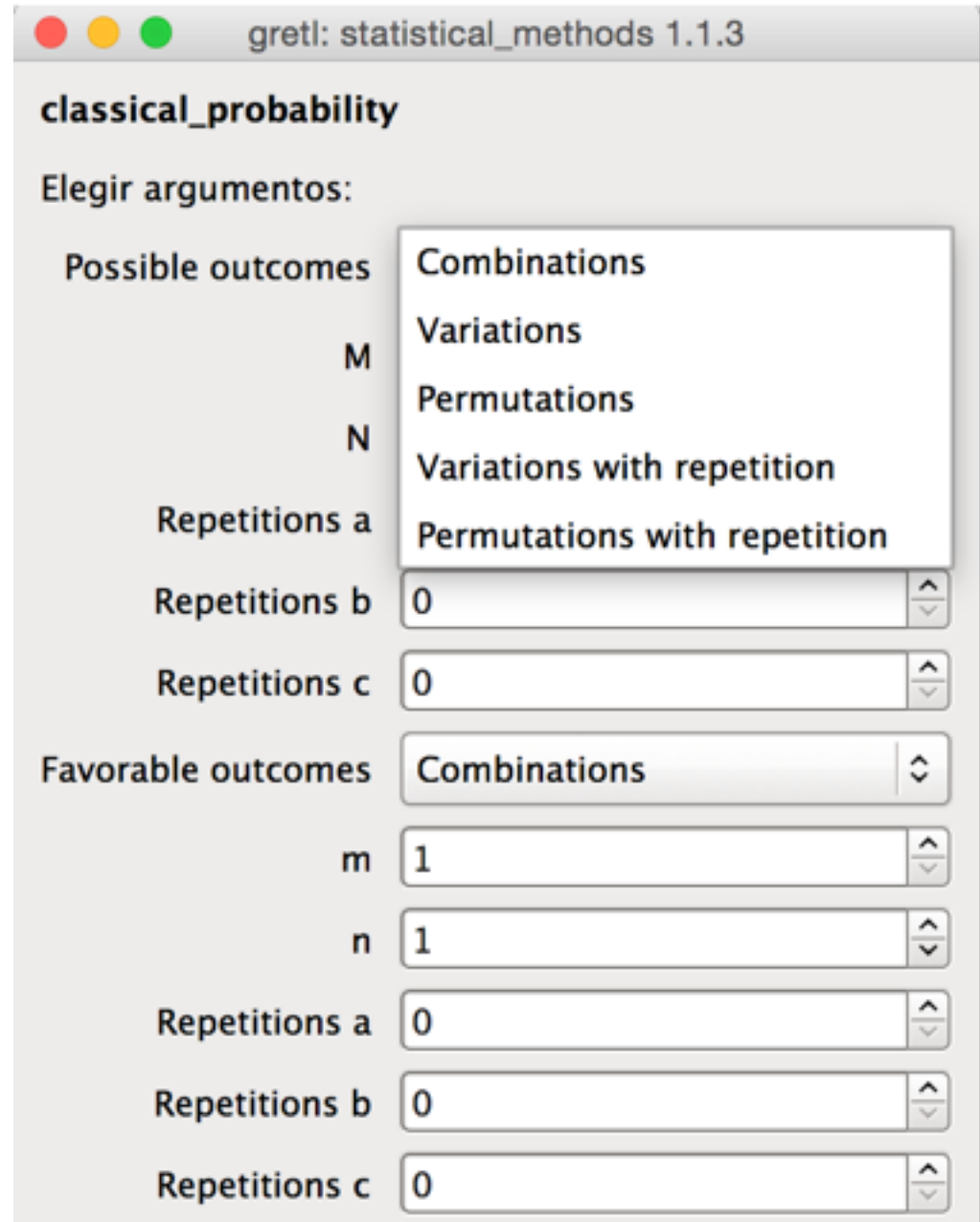
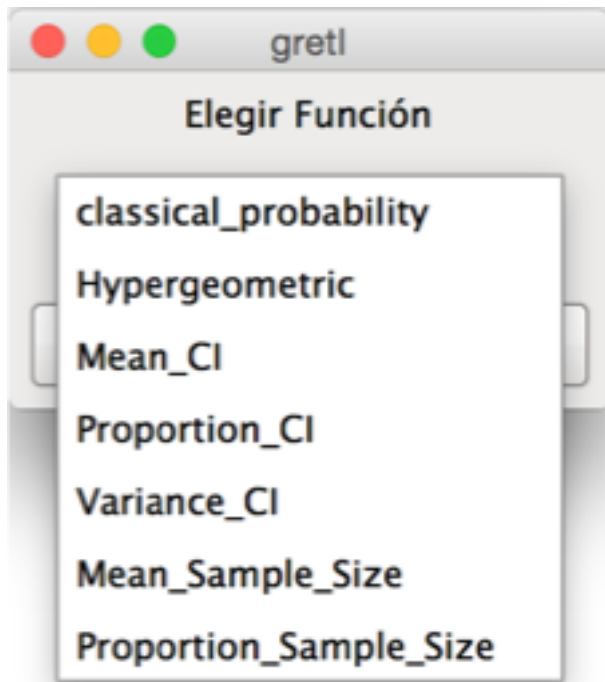
To install Gretl functions, we download them to the computer. We recommend copying the file to the "Documents" folder; in Mac or Linux it is located in the user's main folder).

When you start Gretl all the available functions will be displayed in the menu: **Tools -> Function Package**. Select the "Statistical Methods for Economics" package and add it using the "+" button on the top menu bar. After the package is installed and started, the downloaded package will appear in the Tools menu.



statistical_methods.gfn

Statistical_Methods.gfn



Confidence_Intervals.gfn

gretl: statistical_methods 1.1.3

Mean_CI

Select arguments:

Use a variable data set

Select Variable (series)

Enter Sample mean (scalar)

Enter Standard Deviation (scalar)

Enter sample size

Confidence level (scalar)

Assume that the standard deviation is a population value

Confidence_Intervals.gfn

CONFIDENCE INTERVAL FOR THE MEAN

Selected Variable: vuelos does not follow the normal pattern

We apply Chebyshev inequality

Confidence level: 0.95

We apply Chebyshev inequality, $k = 4.4721$

Sample mean= 68801.1788


Standard deviation= 12225.2836

Confidence interval: (64351.9426 , 73250.415065)




Gretl in Econometrics and Economic Forecasting


Enunciados y ficheros de datos


1. Ventas 

 Ventas - Resuelto


2. Cultura 

 Cultura_Resuelto

3. Tecnología 

 Tecnología_resuelto


4. Tabaco 


 Tabaco resuelto

5. Metal 

 Metal resuelto

6. Energía 


 Energía Resuelto

7. Sanidad USA 

 sanidad_usa.gdt

8. Viajeros 

 Viajeros Resuelto

9. Simulación 

 Función Gretl para Simulación


 Función: Test de raíz unitaria estacional (DHF)


 Series

10. IPI

 IPI Resuelto

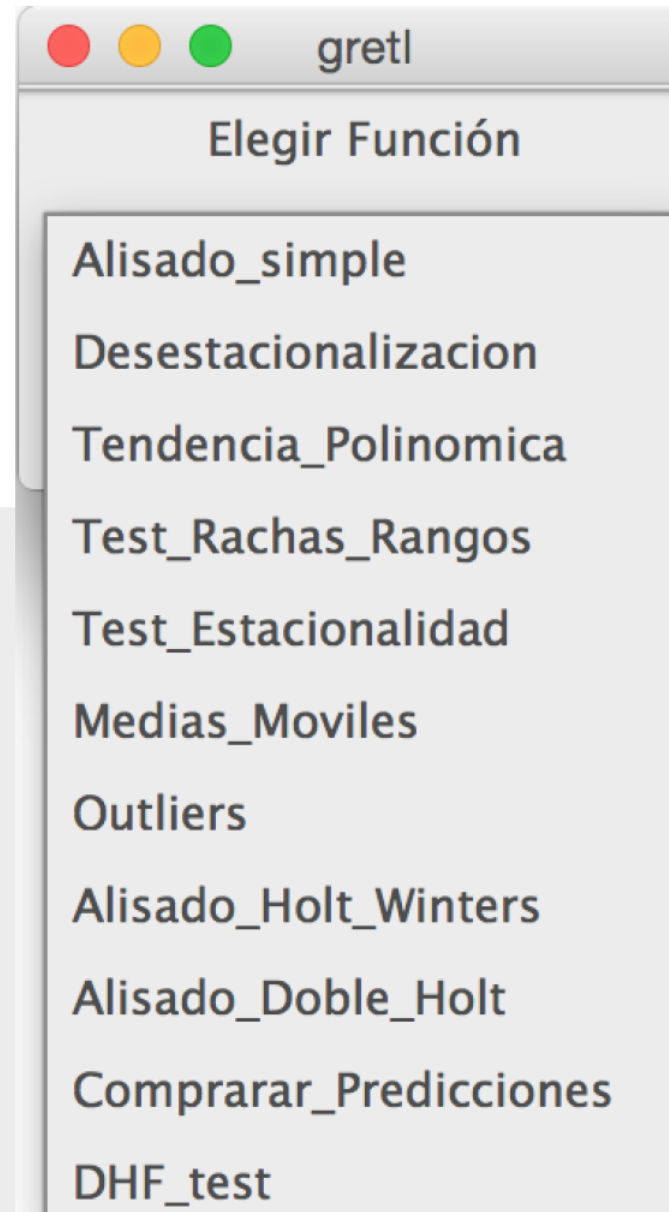
11. LAM 

 LAM Resuelto

12. Consumo_Hogares 

Forecasting.gfn

Correlograma
Periodograma
Filtrar
Análisis ARIMA-X-12
Análisis TRAMO
Exponente de Hurst
Linearization by Tramo
Poblacion Logistica
Shift-Share
Predicción



Four-F Test: Online Survey

	Items	Hypotheses
Personal Characteristics	Level of expertise using Gretl (time) Language Operating System Location (home, work, university, ...) Purpose (individual work, team project, research)	Freedom-Flexibility
Level of specific agreement	Workfile options Output facilities Console Functions User's Guide and Help facilities	Functionality
	Icons Graphs	Friendliness
Level of global agreement	Ease of use Preference to alternative software	

Activities

- Assignments
- Forums
- Glossaries
- OU blogs
- Questionnaires
- Quizzes
- Resources


Navigation

Home


- My home
- My profile / Messages
- Current course
 - Statistical and Econometric Methods (Grado en Econ...**
 - Participants
 - Topics
- My courses

Administration

Statistical and Econometric Methods

- Cuaderno Coordinación
- Foro de Profesores
- 
INTERNATIONAL YEAR OF STATISTICS
- News
- Link to Gretl (V.1.9.92)
- Course Guide
- Comentarios, anécdotas e historias sobre la estadística y la econometría
- Online Survey about Gretl** **NEW**

We would be very grateful if you could answer this online survey (in Spanish) about Gretl. It will only take a few minutes and your answers will help us to improve. Thank you!

 [Editar este formulario](#)

Encuesta sobre Gretl

Estamos realizando una encuesta sobre Gretl en la que te animamos a participar. Te agradecemos que dediques unos minutos a responder a las siguientes cuestiones:

¿Cuánto tiempo hace que usas Gretl?

- Menos de 1 año
- Entre 1 y 2 años
- Más de 2 años

¿Desde dónde usas Gretl?

(es posible seleccionar varias opciones)

- Desde mi casa
- Desde la Facultad
- Desde un ordenador portátil
- Desde una biblioteca o cibercentro
- Otros

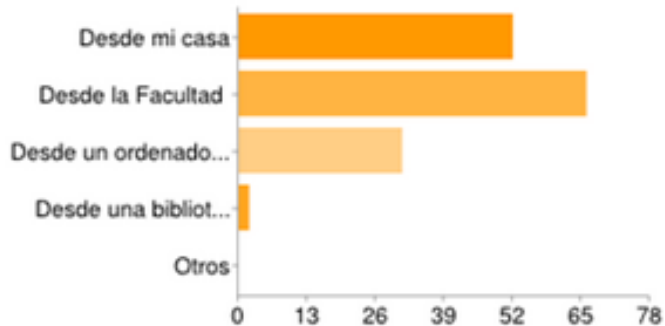
¿Con qué sistema/s operativo/s trabajas?

(es posible seleccionar varias opciones)

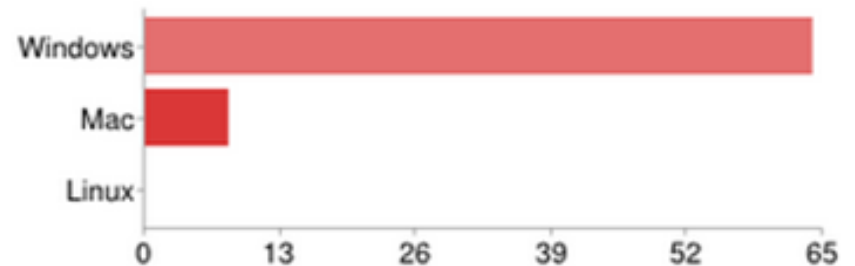
- Windows
- Mac
- Linux

Four-F Test: Flexibility

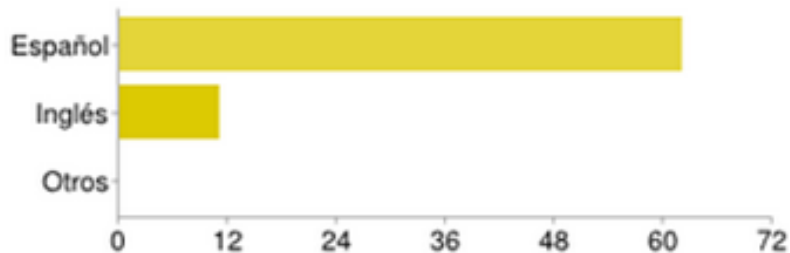
¿Desde dónde usas Gretl?



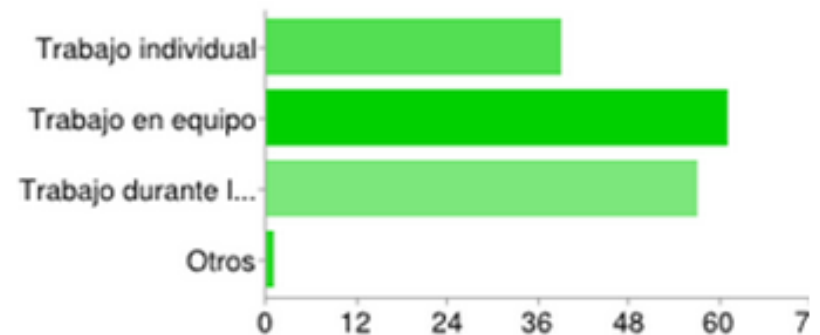
¿Con qué sistema/s operativo/s trabajas?



¿En qué idioma trabajas con Gretl?



¿Qué tipo de trabajo realizas habitualmente



Four-F Test

Empirical Evidence

Binary answers from students' online surveys (n=225)

$$H_0: p > 0.5$$

Students' level of satisfaction with different aspects, according to a Lickert scale from 1 to 5 (n=225)

$$H_0: \mu > 3$$

Four-F Test: Results

		Critical level (p-value)	
Hypothesis	Item	$H_0: p > 0.5$	$H_0: \mu > 3$
FREE-FLEXIBLE	Use from different locations	1	
	Use for different purposes	1	
FUNCTIONAL	Agreement with workfile options	0.01	0
	Agreement with output facilities	1	1
	Agreement with Gretl console	0	0
	Agreement with Gretl functions	0.4	0.42
	Agreement with Gretl User's guide and help facilities	0.5	0
FRIENDLY	Agreement with Gretl icons	0.98	0.99
	Agreement with graphs	1	1
	Ease of use	0.2	0.08
	Preference to alternative software	1	1

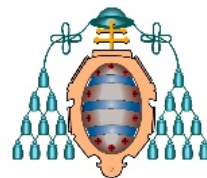
CONCLUDING REMARKS

- The Four-F test includes the requirements of Freedom, Flexibility, Functionality and Friendliness.
- The empirical evidence provided by online surveys confirms that students perceive Gretl as a free, flexible and friendly tool.
- The most satisfactory results correspond to flexibility, perceived usefulness and ease of use, which are expected to positively influence learning.
- Concerning functionality, some difficulties are found with regard to the most demanding aspects such as the console or the workfile management.
- Further efforts are needed in order to improve Gretl's use and knowledge.



EXPLORING EDUCATIONAL ECONOMETRIC SOFTWARE: A DECADE OF EXPERIENCES WITH GRETLM

Ana Jesús López (anai@uniovi.es)
Rigoberto Pérez (rigo@uniovi.es)
University of Oviedo (Spain)



UNIVERSIDAD DE OVIEDO

