

# Scilab Tec 09

Grocer: Scilab toolbox for econometricians

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# Outline

1. What is Grocer?
2. Why Scilab?
3. Who uses Grocer?
4. Grocer documentation and support
5. "Road Map"

# 1. What is Grocer?

Grocer is the free opensource econometric toolbox for Scilab

- ▶ Econometrics is a branch of statistics devoted to economic questions
- ▶ Other free [sometimes open-source] software more or less specialized exist: Gretl, Easyreg, JMulti, ...
- ▶ Grocer has two particularities: it is written in Scilab; it proposes most standard econometric procedures as well as some more rare ones

# 1. What is Grocer?

## Econometric methods programmed in Grocer (I):

- ordinary least squares and various single equation methods (autocorelated models, instrumental variables, non linear least squares, robust methods, ...)
- basic estimation with limited dependent variables: ordered logit and probit (with 2 or more variables); tobit; multivariate logit
- specification tests (multicolinearity, autocorrelation, heteroskedasticity, normality, predictive failure, ...)
- simultaneous equations methods (SUR, two and three stage least squares, ...)
- VAR, VECM, VARMA and GARCH estimation
- the generalized method of moments (GMM)
- the Kalman filter and time varying parameters estimation
- unit root tests (ADF, KPSS, ...) and cointegration methods (CADF, Johansen, ...)
- various business cycle tools: HP, Baxter-King and Christiano-Fitzgerald filters, the Bry-Boschan-Harding-Pagan procedure for the datation of turning points, spectral analysis
- basic panel data estimation: fixed and random effects, between estimation
- static and dynamic factor estimation
- numerous time series disaggregation methods: Chow-Lin, Litterman, ...

# 1. What is Grocer?

## Econometric methods programmed in Grocer (II):

- a "pc-gets" like function for selecting the "good" model between a great number of potentially relevant ones
- estimation of Markov-switching models
- bayesian model averaging (BMA) estimation
- a contributions device, that provides contributions of exogenous variables to an endogenous one for any dynamic equation

⇒ (almost) all standard econometric methods and several rare (but useful!) ones

⇒ Near 700 Scilab functions

# 1. What is Grocer?

## Example 1

```
--> bounds('1979q1','2005q4')

--> r1=automatic('dl_yman','groups_pval=[]'...
'lagts(2,dl_yman)','lagts(3,dl_yman)','ppa_m1',...
'lagts(2,dl_yman)','lagts(3,dl_yman)','ppa_m1',...
'ppa_m1-lagts(ppa_m3)','lagts(ppa_m3-ppa_m2)',...
'lagts(ppa_m2-ppa_m1)','ppr_m1',...
'ppr_m1-lagts(ppr_m3)','lagts(ppr_m3-ppr_m2)',...
'lagts(ppr_m2-ppr_m1)','ccom_m1',...
'ccom_m1-lagts(ccom_m3)','lagts(ccom_m3-ccom_m2)',...
'lagts(ccom_m2-ccom_m1)','pgp_m1',...
'pgp_m1-lagts(pgp_m3)','lagts(pgp_m3-pgp_m2)',...
'lagts(pgp_m2-pgp_m1)','const')
```

# 1. What is Grocer?

## Example 1

```
--> bounds('1979q1','2005q4')
```

```
--> r1=automatic('dl_yman','groups_pval=[]'...  
'lagts(2,dl_yman)','lagts(3,dl_yman)','ppa_m1',...  
'lagts(2,dl_yman)','lagts(3,dl_yman)','ppa_m1',...  
'ppa_m1-lagts(ppa_m3)','lagts(ppa_m3-ppa_m2)',...  
'lagts(ppa_m2-ppa_m1)','ppr_m1',...  
'ppr_m1-lagts(ppr_m3)','lagts(ppr_m3-ppr_m2)',...  
'lagts(ppr_m2-ppr_m1)','ccom_m1',...  
'ccom_m1-lagts(ccom_m3)','lagts(ccom_m3-ccom_m2)',...  
'lagts(ccom_m2-ccom_m1)','pgp_m1',...  
'pgp_m1-lagts(pgp_m3)','lagts(pgp_m3-pgp_m2)',...  
'lagts(pgp_m2-pgp_m1)','const')
```

22 exogenous  
variables  
=  $2^{22}$  models  
= 4 194 304 models

# 1. What is Grocer?

## Example 1 - Result (a)

---

```
| results of the automatic regression package |
```

---

```
final model
```

```
strategy                               : liberal
F presearch significance level          : 0.5
t-test significance level                : 0.05
F test significance level                : 0.075
specification tests significance level   : 0.01
Information criterion                    : bic
```

```
ending reason: stage 2 models selected by bic criterion
```



# 1. What is Grocer?

## Example 1 - Result (b)

```
ols estimation results for dependent variable: dl_yman
estimation period: 1979q1-2005q4
number of observations: 108
number of variables: 5
R2 = 0.4224306          adjusted R2 =0.4000007
Overall F test: F(4,103) = 18.833387          p-value = 1.201D-11
standard error of the regression: 0.0091205
sum of squared residuals: 0.0085680
DW(0) =2.1195096
Belsley, Kuh, Welsch Condition index: 1
```

variable	coeff	t-statistic	p value
ppa_m1-lagts (ppa_m3)	0.0004759	2.11339	0.0369831
ppr_m1	0.0004378	5.2770094	0.0000007
ppr_m1-lagts (ppr_m3)	0.0008271	3.475376	0.0007479
lagts (ppr_m3-ppr_m2)	0.0005528	2.1094587	0.0373286
const	0.0041277	4.4094864	0.0000255

\*  
\*       \*

# 1. What is Grocer?

## Example 1 - Result (c)

```
tests results:
```

```
*****
```

test			test value	p-value
Chow pred. fail. (50%)			1.283012	0.1890547
Chow pred. fail. (90%)			0.8656151	0.5762860
Doornik & Hansen			3.6642689	0.1600715
AR(1-4)			2.5361375	0.0447809
hetero x-squared			0.7498384	0.6474424

# 1. What is Grocer?

## Example 1 - Result (c)

```
tests results:
```

```
*****
```

```
test                test value  p-value
```

```
Chow pred. fail. (50%)  1.283012  0.1890547
```

```
Chow pred. fail. (90%)  0.8656151  0.5762860
```

```
Doornik & Hansen      3.6642689  0.1600715
```

```
AR(1-4)               2.5361375  0.0447809
```

```
hetero x_squared      0.7498384  0.6474424
```

} 4 among the 14  
"specification" tests  
existing in Grocer

# 1. What is Grocer?

## Example 1 - Result (c)

tests results:

\*\*\*\*\*

test	test value	p-value
------	------------	---------

Chow pred. fail. (50%)	1.283012	0.1890547
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Chow pred. fail. (90%)	0.8656151	0.5762860
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Doornik & Hansen	3.6642689	0.1600715
------------------	-----------	-----------

AR(1-4)	2.5361375	0.0447809
---------	-----------	-----------

hetero x_squared	0.7498384	0.6474424
------------------	-----------	-----------

} 4 among the 14  
"specification" tests  
existing in Grocer

\*

\*

\*

# 1. What is Grocer?

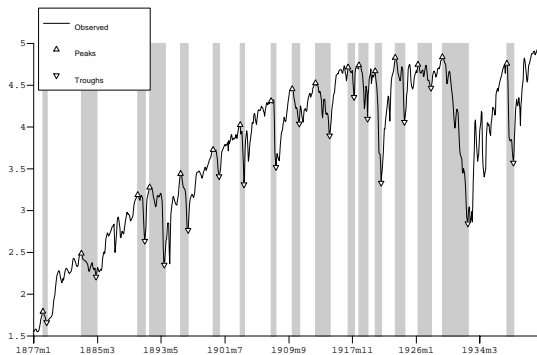
## Example 2

```
--> rbb1 = brybos('lpigiron', 'proc=' 'bb' '');
```

# 1. What is Grocer?

## Example 2

Turning points analysis of Ipigiron



## 2. Why Scilab?

- ▶ Scilab is:
  - free
  - opensource  $\Rightarrow$  slight modifications of Scilab code
  - and therefore portable: useful when changing often employer (already 6 times for me!)
- ▶ Scilab matrix language is particularly adapted to econometricians' needs  
Econometric basic formula:  $\hat{b} = (X'X)^{-1}X'Y$  becomes in Scilab:  
`bhat=inv(X'*X)*X'*Y`
- ▶ Many econometric problems involve the maximisation of a so-called likelihood function: Scilab optim function is well-suited to this task

## 2. Why Scilab?

- ▶ Scilab is very similar to Matlab and Gauss
  - ⇒ Matlab or Gauss programs can be adapted easily to Scilab: around 2/3 of Grocer programs are adaptations from existing Matlab or Gauss programs (thanks to Benoît Bellone, James LeSage, Jaime Terceiro and many others!)
- ▶ Scilab typing flexibility offered by the overloading capacity
  - ⇒ has allowed the creation of the time series type



### 3. Who uses Grocer?

- ▶ Practitioners
- ▶ Teachers and Students
- ▶ Researchers

### 3. Who uses Grocer?

#### Teachers and Students

- ▶ Vincent Bouvatier at Paris 10 Nanterre

<http://economix.u-paris10.fr/fr/membres/?id=904>

- ▶ Olivier Darné at Paris 10 Nanterre

<http://economix.u-paris10.fr/fr/membres/index.php?id=393>

- ▶ UE Statistiques - informatique 6 at Paris 13

[http://www-galilee.univ-paris13.fr/fichiers/brochure\\_Licence\\_MIEF.pdf](http://www-galilee.univ-paris13.fr/fichiers/brochure_Licence_MIEF.pdf)

- ▶ and myself at ENSAE!

### 3. Who uses Grocer?

Researchers (most significant examples, see details at <http://dubois.ensae.net/citations.html>)

▶ The Markov-switching program:

Abberger K. (2008) and Abberger K. und W. Nierhaus (2008), in IFO Schnelldienst n°61.

▶ The Bry-Boschan program:

- Bardaji J and Tallet F. (2008) at the 28th Annual international Symposium of Forecasting, Nice.

- Jayaram S., Patnaik I. and A. Shah (2009), working paper

- Yamada and al. (2007) at the Modsim07 Congress

▶ The automatic program:

- Barhoumi and al. in the Banque de France Note d'études et de recherche n° 222.

- Darné O. (2008) in the *Economics Bulletin*, Vol. 3, No. 32.

- Erkel-Rousse E. and C. Minodier (2008), at the *Association Française de Sciences Économiques* Congress.

## 4. Documentation and support

- ▶ standard help files available by Scilab help (431 help files)
- ▶ a user manual (25 chapters), available at <http://dubois.ensae.net.grocer.html>
- ▶ 95 demo programs
- ▶ a dedicated mail box: `grocer.toolbox@free.fr`

## 5. Road Map

- ▶ 2nd half of 2009: Grocer 1.4 (5th "big" version from the 1.0 posted in october 2004) will be posted on the web. Main news: a new object for dealing with time series (tsmat); panel unit root tests; standard tests on cointegration vectors in the Johansen procedure; a turning point program dedicated to qualitative variables
- ▶ 2010 and after: ols with ARMA errors; trend-cycle unobserved component models; E-GARCH, GARCH-M and other garch methods that are currently lacking in GROCER; trend-cycle unobserved component models; macroeconometric model simulations? GUI interface?
- ▶ according to our users needs, our own needs ... and the leisure time Emmanuel and me will have!

Thank you for your attention