```
      name:  <unnamed>
       log:  /Users/nicot/Dropbox (CEDIA)/ULaval/Travail/SLIM/Selection/select
> code.smcl
  log type:  smcl
 opened on:  11 Aug 2016, 11:16:41

 1 .
 2 . //Simulation de regressions
 3 . clear all

 4 . cd "/Users/nicot/Dropbox (CEDIA)/ULaval/Travail/SLIM/Selection"
/Users/nicot/Dropbox (CEDIA)/ULaval/Travail/SLIM/Selection

 5 .
 6 . set obs 1000
number of observations (_N) was 0, now 1,000

 7 . set seed 123

 8 .
 9 . *creation du modele
10 . gen expo=rnormal(0,1)

11 . gen x=rnormal(0,1)

12 . gen inter=expo*x

13 .
14 . gen error=rnormal(0,1)

15 .
16 . gen y=1+expo+x+inter+error

17 .
18 . sum y expo x inter

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
           y |      1,000    .9978072    1.987555  -6.321197   10.84289
        expo |      1,000    .0204975    .9719571  -4.604603   2.807839
           x |      1,000    .0202697    .9961863  -3.542322    3.40045
       inter |      1,000    -.002354    .9786722  -8.675727   5.957363
```

```
19 .
20 . regress y expo x inter
```

Source	SS	df	MS		
Model	2913.24857	3	971.082857	Number of obs	= 1,000
Residual	1033.17408	996	1.03732337	F(3, 996)	= 936.14
				Prob > F	= 0.0000
				R-squared	= 0.7382
				Adj R-squared	= 0.7374
Total	3946.42265	999	3.95037303	Root MSE	= 1.0185

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
expo	1.018943	.0331618	30.73	0.000	.953868	1.084018
x	1.015131	.032414	31.32	0.000	.9515233	1.078738
inter	1.023784	.0330023	31.02	0.000	.9590223	1.088546
_cons	.958755	.0322214	29.76	0.000	.8955253	1.021985

```
21 .
22 . *outtex, detail level legend title(R\'{e}gression : mod\`{e}le de base) key(
   > modele)
23 .
24 . *selection aleatoire
25 . gen toto = runiform()

26 . sort toto

27 . generate random = _n <= 750

28 .
29 . bysort random: summarize x
```

-> random = 0

Variable	Obs	Mean	Std. Dev.	Min	Max
x	250	.0091655	1.104196	-3.023799	3.40045

-> random = 1

Variable	Obs	Mean	Std. Dev.	Min	Max
x	750	.0239711	.9582475	-3.542322	3.139379

```
30 .
31 . regress y expo x inter if random==1
```

Source	SS	df	MS	Number of obs	=	750
				F(3, 746)	=	703.93
Model	2098.52164	3	699.507212	Prob > F	=	0.0000
Residual	741.315286	746	.993720222	R-squared	=	0.7390
				Adj R-squared	=	0.7379
Total	2839.83692	749	3.79150457	Root MSE	=	.99686

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
expo	1.059464	.037394	28.33	0.000	.9860545	1.132874
x	1.040988	.0380342	27.37	0.000	.9663211	1.115655
inter	1.031223	.0402996	25.59	0.000	.9521084	1.110337
_cons	.9707738	.0364255	26.65	0.000	.8992651	1.042283

```
32 .
33 . *outtex, detail level legend title(R\'{e}gression : s\'{e}lection al\'{e}ato
   > ire (MCAR))
34 .
35 .
36 . *selection sur x, avec x et expo correles
37 . sort x

38 . gen n1=_n

39 . gen selectx=n1 <= 750

40 .
41 . bysort selectx: summarize x
```

-> selectx = 0

Variable	Obs	Mean	Std. Dev.	Min	Max
x	250	1.274757	.5667745	.6579035	3.40045

-> selectx = 1

Variable	Obs	Mean	Std. Dev.	Min	Max
x	750	-.3978927	.7186514	-3.542322	.657464

```
42 .
43 . regress y expo x inter if selectx==1
```

Source	SS	df	MS	Number of obs	=	750
				F(3, 746)	=	337.98
Model	1006.48905	3	335.496351	Prob > F	=	0.0000
Residual	740.528516	746	.99266557	R-squared	=	0.5761
				Adj R-squared	=	0.5744
Total	1747.01757	749	2.33246672	Root MSE	=	.99633

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
expo	1.019353	.0424256	24.03	0.000	.9360654	1.102641
x	.9721352	.0507898	19.14	0.000	.8724273	1.071843
inter	1.027505	.0529332	19.41	0.000	.9235897	1.131421
_cons	.9320326	.0416651	22.37	0.000	.8502378	1.013827

```
44 .
45 . *outtex, detail level legend title(R\'{e}gression : s\'{e}lection sur x (MAR
   > ))
46 .
47 . *selection sur y
48 . sort y

49 . gen n2=_n

50 . gen selecty=n2 <= 750

51 .
52 . bysort selecty: summarize y
```

-> selecty = 0

Variable	Obs	Mean	Std. Dev.	Min	Max
y	250	3.634055	1.46297	2.097084	10.84289

-> selecty = 1

Variable	Obs	Mean	Std. Dev.	Min	Max
y	750	.1190579	1.210155	-6.321197	2.069365

```
53 .
54 . regress y expo x inter if selecty==1
```

Source	SS	df	MS	Number of obs	=	750
				F(3, 746)	=	196.82
Model	484.617296	3	161.539099	Prob > F	=	0.0000
Residual	612.274102	746	.820742764	R-squared	=	0.4418
				Adj R-squared	=	0.4396
Total	1096.8914	749	1.4644745	Root MSE	=	.90595

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
expo	.7459536	.0402281	18.54	0.000	.6669798	.8249275
x	.731424	.0413839	17.67	0.000	.6501812	.8126669
inter	.8337301	.0405708	20.55	0.000	.7540836	.9133766
_cons	.5888732	.0384818	15.30	0.000	.5133277	.6644187

```
55 .
56 . *outtex, detail level legend title(R\'{e}gression : s\'{e}lection sur y (NMA
   > R))
57 .
58 .
59 . //Simulation MC
60 . *modele
61 . clear all

62 . capture program drop model

63 . program define model, rclass
     1.
64 . drop _all
     2. set obs 1000
     3.
65 . generate expo = rnormal(0,1)
     4. generate x = rnormal(0,1)
     5. generate inter=expo*x
     6. generate error = rnormal(0,1)
     7. generate y = 1 + expo + x + inter + error
     8.
```

```
66 . regress y expo x inter
     9.
67 . return scalar bcons = _b[_cons]
    10. return scalar bexpo = _b[expo]
    11. return scalar bx = _b[x]
    12. return scalar binter = _b[inter]
    13. end

68 .
69 . simulate b_cons=r(bcons) b_expo=r(bexpo) b_x=r(bx) b_inter=r(binter), reps(1
   > 000) nodots: model

         command:  model
          b_cons:  r(bcons)
          b_expo:  r(bexpo)
             b_x:  r(bx)
         b_inter:  r(binter)


70 .
71 . program drop _all

72 . sum

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
      b_cons |      1,000    .9986508    .0313321   .8839754   1.103671
      b_expo |      1,000    1.000525      .03217   .9012343   1.089759
         b_x |      1,000    1.001356    .0322228   .9023424   1.096507
     b_inter |      1,000    .9975404    .0327809   .8787383   1.100114

73 . hist b_expo, xtitle(exposition) ytitle(densité) graphregion(fcolor(white))
   (bin=29, start=.90123433, width=.00650086)

74 . graph save hist_b_expo, replace
   (file hist_b_expo.gph saved)
```

```
75 . hist b_inter, xtitle(interaction) ytitle(densité) graphregion(fcolor(white))
   (bin=29, start=.87873834, width=.00763365)

76 . graph save hist_b_inter, replace
   (file hist_b_inter.gph saved)

77 . graph combine hist_b_expo.gph hist_b_inter.gph, title("Paramètres pour expos
   > ition et interaction:" "Modèle de base", color(black)) graphregion(fcolor(wh
   > ite))

78 .
79 . gr export "model.eps", as(eps) preview(off) replace
   (file model.eps written in EPS format)

80 .
81 .
82 . *selection aleatoire
83 . clear all

84 . capture program drop random

85 . program define random, rclass
     1.
86 . drop _all
     2. set obs 1000
     3.
87 . generate expo = rnormal(0,1)
     4. generate x = rnormal(0,1)
     5. generate inter=expo*x
     6. generate error = rnormal(0,1)
     7. generate y = 1 + expo + x + inter + error
     8.
88 . gen toto = runiform()
     9. sort toto
    10. generate random = _n <= 750
    11.
89 . regress y expo x inter if random==1
    12.
```

```
90 . return scalar bcons = _b[_cons]
    13. return scalar bexpo = _b[expo]
    14. return scalar bx = _b[x]
    15. return scalar binter = _b[inter]
    16. end

91 .
92 . simulate b_cons=r(bcons) b_expo=r(bexpo) b_x=r(bx) b_inter=r(binter), reps(1
   > 000) nodots: random

         command:  random
          b_cons:  r(bcons)
          b_expo:  r(bexpo)
             b_x:  r(bx)
         b_inter:  r(binter)


93 .
94 . program drop _all

95 . sum

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
      b_cons |      1,000    .9988118    .0363242   .8671843   1.113319
      b_expo |      1,000    .9996793    .0371919   .8924965   1.111483
         b_x |      1,000    .9998527    .0353161   .8851036   1.148267
     b_inter |      1,000    1.001782     .037343   .8821909   1.108563

96 . hist b_expo, xtitle(exposition) ytitle(densité) graphregion(fcolor(white))
   (bin=29, start=.89249647, width=.00755125)

97 . graph save hist_b_expo, replace
   (file hist_b_expo.gph saved)

98 . hist b_inter, xtitle(interaction) ytitle(densité) graphregion(fcolor(white))
   (bin=29, start=.88219094, width=.00780593)
```

```
 99 . graph save hist_b_inter, replace
    (file hist_b_inter.gph saved)

100 . graph combine hist_b_expo.gph hist_b_inter.gph, title("Paramètres pour expos
    > ition et interaction:" "Sélection aléatoire (MCAR)", color(black)) graphregi
    > on(fcolor(white))

101 .
102 . gr export "random.eps", as(eps) preview(off) replace
    (file random.eps written in EPS format)

103 .
104 .
105 . *selection sur x
106 . clear all

107 . capture program drop selectx

108 . program define selectx, rclass
      1.
109 . drop _all
      2. set obs 1000
      3.
110 . generate expo = rnormal(0,1)
      4. generate x = rnormal(0,1)
      5. generate inter=expo*x
      6. generate error = rnormal(0,1)
      7. generate y = 1 + expo + x + inter + error
      8.
111 . sort x
      9. gen n1=_n
     10. gen selectx=n1 <= 750
     11.
112 . regress y expo x inter if selectx==1
     12.
113 . return scalar bcons = _b[_cons]
     13. return scalar bexpo = _b[expo]
     14. return scalar bx = _b[x]
     15. return scalar binter = _b[inter]
     16. end
```

```
114 .
115 . simulate b_cons=r(bcons) b_expo=r(bexpo) b_x=r(bx) b_inter=r(binter), reps(1
    > 000) nodots: selectx

      command:  selectx
       b_cons:  r(bcons)
       b_expo:  r(bexpo)
          b_x:  r(bx)
      b_inter:  r(binter)


116 .
117 . program drop _all

118 . sum

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
      b_cons |      1,000    1.002956    .0427962   .8598431   1.115789
      b_expo |      1,000    .9985082    .0402189   .8850054   1.132673
         b_x |      1,000    1.002135    .0504367   .8331351   1.155716
     b_inter |      1,000    .9988019    .0504382   .8721379     1.1764

119 . hist b_expo, xtitle(exposition) ytitle(densité) graphregion(fcolor(white))
    (bin=29, start=.88500541, width=.00854027)

120 . graph save hist_b_expo, replace
    (file hist_b_expo.gph saved)

121 . hist b_inter, xtitle(interaction) ytitle(densité) graphregion(fcolor(white))
    (bin=29, start=.8721379, width=.01049181)

122 . graph save hist_b_inter, replace
    (file hist_b_inter.gph saved)

123 . graph combine hist_b_expo.gph hist_b_inter.gph, title("Paramètres pour expos
    > ition et interaction:" "Sélection sur x (MAR)", color(black)) graphregion(fc
    > olor(white))
```

```
124 .
125 . gr export "selectx.eps", as(eps) preview(off) replace
    (file selectx.eps written in EPS format)

126 .
127 .
128 . *selection sur y
129 . clear all

130 . capture program drop selecty

131 . program define selecty, rclass
      1.
132 . drop _all
      2. set obs 1000
      3.
133 . generate expo = rnormal(0,1)
      4. generate x = rnormal(0,1)
      5. generate inter=expo*x
      6. generate error = rnormal(0,1)
      7. generate y = 1 + expo + x + inter + error
      8.
134 . sort y
      9. gen n2=_n
     10. gen selecty=n2 <= 750
     11.
135 . regress y expo x inter if selecty==1
     12.
136 . return scalar bcons = _b[_cons]
     13. return scalar bexpo = _b[expo]
     14. return scalar bx = _b[x]
     15. return scalar binter = _b[inter]
     16. end

137 .
138 . simulate b_cons=r(bcons) b_expo=r(bexpo) b_x=r(bx) b_inter=r(binter), reps(1
    > 000) nodots: selecty

          command:  selecty
           b_cons:  r(bcons)
           b_expo:  r(bexpo)
              b_x:  r(bx)
          b_inter:  r(binter)
```

```
139 .
140 . program drop _all

141 . sum
```

Variable	Obs	Mean	Std. Dev.	Min	Max
b_cons	**1,000**	**.6501032**	**.0436375**	**.4756556**	**.7768875**
b_expo	**1,000**	**.7575017**	**.0423007**	**.6335891**	**.8906894**
b_x	**1,000**	**.7607323**	**.0415359**	**.5884346**	**.8960094**
b_inter	**1,000**	**.8190863**	**.0436601**	**.6781988**	**.9803056**

```
142 . hist b_expo, xtitle(exposition) ytitle(densité) graphregion(fcolor(white))
    (bin=29, start=.63358909, width=.00886553)

143 . graph save hist_b_expo, replace
    (file hist_b_expo.gph saved)

144 . hist b_inter, xtitle(interaction) ytitle(densité) graphregion(fcolor(white))
    (bin=29, start=.67819875, width=.01041748)

145 . graph save hist_b_inter, replace
    (file hist_b_inter.gph saved)

146 . graph combine hist_b_expo.gph hist_b_inter.gph, title("Paramètres pour expos
    > ition et interaction:" "Sélection sur y (NMAR)", color(black)) graphregion(f
    > color(white))

147 .
148 . gr export "selecty.eps", as(eps) preview(off) replace
    (file selecty.eps written in EPS format)

149 .
150 . log close
          name:  <unnamed>
           log:  /Users/nicot/Dropbox (CEDIA)/ULaval/Travail/SLIM/Selection/select
    > code.smcl
      log type:  smcl
     closed on:  11 Aug 2016, 11:17:53
    ------------------------------------------------------------------------------
```