5th set of assignments Financial Econometrics- solutions

5.1 using avewret

System: CAPM
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:11
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.067309	0.056669	18.83400	0.0000
C(2)	-3.211099	1.694037	-1.895531	0.0582
Determinant residual covariance		9.79E-35		
J-statistic		0.011896		

J-Statistics: (for calculation: see assignment sheet)
jval = 2.2245
pval = 0.9733

5.1 using avvwret

System: CAPM2
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:29
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.132061	0.088452	12.79854	0.0000
C(2)	-6.997747	3.561610	-1.964771	0.0496
Determinant residual covariance		1.38E-33		
J-statistic		0.010975		

J-Statistics:
jval2 = 2.0523
pval2 = 0.9794

5.2 using avewret

System: CAPM_EX
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:33
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(2)	-3.635131	0.800801	-4.539369	0.0000
Determinant residual covariance	2.03E-36			
J-statistic	0.013363			

J-Statistics:
jval_ex = 2.4988
pval_ex = 0.9809

5.2 using avvwret

System: CAPM_EX2
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:34
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(2)	-4.924601	1.082375	-4.549809	0.0000
Determinant residual covariance	2.49E-36			
J-statistic	0.013145			

J-Statistics:
jval_ex2 = 2.4581
pval_ex2 = 0.9820

5.3 using avewret

System: FAMA_FRENCH
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:53
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.631875	0.357282	1.768560	0.0771
C(2)	-0.257423	0.393292	-0.654534	0.5128
C(3)	-0.853027	0.416109	-2.050007	0.0405

Determinant residual covariance	4.57E-64	
J-statistic	0.017830	

J-Statistics:
jval_fafr = 3.3343
pval_fafr = 0.8525

Wald Test:
System: FAMA_FRENCH

Test Statistic	Value	df	Probability
Chi-square	9.944229	2	0.0069

5.3 using avvwret

System: FAMA_FRENCH2
Estimation Method: Generalized Method of Moments
Date: 06/21/05 Time: 17:53
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
Identity weighting matrix - 2SLS coefficients with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.542606	0.493584	-1.099319	0.2718
C(2)	-0.776924	0.448708	-1.731467	0.0835
C(3)	-0.101936	0.447192	-0.227947	0.8197

Determinant residual covariance	3.05E-60	
J-statistic	0.012763	

J-Statistics:
jval_fafr2 = 2.3868
pval_fafr2 = 0.9354

Wald Test:
System: FAMA_FRENCH2

Test Statistic	Value	df	Probability
Chi-square	1855.244	3	0.0000

6th set of assignments Financial Econometrics – solutions

pooled time series regression using avvwret

- Sample(adjusted)! 1947:2-1993:4

- *series factor1b = avvwret-avustret*
  series factor2 = hml_r-1
  series factor3 = smb_r-1

- Objects -> new objects -> pool: pooled time series regression
  Dependent variable: decile?-avustret
  Cross section specific coefficients: c factor1b factor2 factor3
  No intercept, no weighting -> estimate
  Make residuals
  matrix varcovres6b = @cov(residuals6b)

- group factors: factors6b
- *matrix varcovfactor6b = @cov(factors6b)*

- create mean vector:
  vector(3) meanfac6b
  meanfac6b.fill @mean(factor1b),@mean(factor2),@mean(factor3)

  0.018130
  0.002613
  -0.005883

- GRS statistic:

  apha: see assignment sheet
  one: see assignment sheet

  matrix grsb =
  t@inverse(one+(@transpose(meanfac6b)*@inverse(varcovfactor6b)*meanfac6b))**
  @transpose(alpha6b)@inverse(varcovres6b)*alpha6b*

  GRS- Statistic: 10.545

- p-value :
  matrix pavelgrs6b = one-@cchisq(grsb,10)
  p-value = 0.394

7th set of assignments Financial Econometrics – solutions

1. Alternative1:

Construct a system as in assignment sheet 5:

System: ALTERNATIVE1
Estimation Method: Generalized Method of Moments
Date: 06/23/05 Time: 14:08
Sample: 1947:2 1993:4
Included observations: 187
Total system (balanced) observations 1870
Kernel: Bartlett, Bandwidth: Fixed (4), No prewhitening
2SLS coefficient estimates with GMM standard errors

	Coefficient	Std. Error	t-Statistic	Prob.
C(2)	-0.990917	0.001132	-875.1660	0.0000
Determinant residual covariance		9.26E-79		
J-statistic		0.052227		

2. Alternative 2:

- Sample(adjusted): 1947:2 1993:4

- Objects -> new objects -> pool: pooled time series regression: assets
  Dependent variable: decile?-avustret
  Cross section specific coefficients: c cnsqdifferenz
  No intercept, no weighting -> estimate
  Make residuals
  matrix varcovres = @cov(residuals)

  vector beta = @subextract(assets.@coefs,11,1,20,1)

  4.966555
  4.464380
  4.248438
  3.798502
  3.517813
  3.172752
  3.038945
  2.826603
  2.220660
  2.231426

- *vector(10) avreturn*
  avreturn.fill @mean(decile1-avustret),@mean(decile2-avustret),@mean(decile3-avustret),@mean(decile4-avustret),@mean(decile5-avustret),@mean(decile6-avustret),@mean(decile7-avustret),@mean(decile8-avustret),@mean(decile9-avustret),@mean(decile10-avustret)

- compute lambda
  *matrix lambda = @inverse(@transpose(beta)*beta)*@transpose(beta)*avreturn*
  lambda = 0.006450

- compute alpha
  *matrix alpha = avreturn - beta*lambda*

- Separate the computation of the variance-covariance matrix of alpha:
  First part:
  scalar t = @regobs
  matrix firstalpha = 1/t(ones-beta*@inverse(@transpose(beta)*beta)*@transpose(beta))*varcovres*(ones-beta*@inverse(@transpose(beta)*beta)*@transpose(beta))*

  Second part:
  matrix varfactor = @var(cnsqdifferenz)
  matrix lastalpha = (one+ @transpose(lambda)@inverse(varfactor)*lambda)*
  create a scalar lastalpha3 from matrix lastalpha:
  scalar lastalpha3 = 2.34757952912

  compute the symmetric variance-covariance matrix of alpha by multiplying both parts:
  *sym varcovalpha = lastalpha3*firstalpha*

  since the variance-covariance matrix of alpha is not invertable: compute the pseudo-inverse for the test statistic
  scalar rang = @rank(varcovalpha)
  matrix v
  vector w
  matrix u=@svd(varcovalpha,w,v)
  matrix w1=@makediagonal(w)
  matrix w2=@subextract(w1,1,1,rang,rang)
  matrix v2=@subextract(@transpose(v),1,1,rang,10)
  matrix u2=@subextract(@transpose(u),1,1,rang,10)

  matrix pseudoinvcovalph=@transpose(v2)@inverse(@transpose(w2)*w2)*@transpose(w2)*u2*

- compute the test statistic
  *matrix statistic7=@transpose(alpha)*pseudoinvcovalph*alpha*
  test statistic = 6.964663
  p-value = 0.640799

3. <u>Alternative3: (Does not work with Eviews)</u>

Construct a system as follows:

```
(decile1-avustret)-c(1)-c(2)*cnsqdifferenz=0
((decile1-avustret)-c(1)-c(2)*cnsqdifferenz)*cnsqdifferenz=0
(decile2-avustret)-c(3)-c(4)*cnsqdifferenz=0
((decile2-avustret)-c(3)-c(4)*cnsqdifferenz)*cnsqdifferenz=0
(decile3-avustret)-c(5)-c(6)*cnsqdifferenz=0
((decile3-avustret)-c(5)-c(6)*cnsqdifferenz)*cnsqdifferenz=0
(decile4-avustret)-c(7)-c(8)*cnsqdifferenz=0
((decile4-avustret)-c(7)-c(8)*cnsqdifferenz)*cnsqdifferenz=0
(decile5-avustret)-c(9)-c(10)*cnsqdifferenz=0
((decile5-avustret)-c(9)-c(10)*cnsqdifferenz)*cnsqdifferenz=0
(decile6-avustret)-c(11)-c(12)*cnsqdifferenz=0
((decile6-avustret)-c(11)-c(12)*cnsqdifferenz)*cnsqdifferenz=0
(decile7-avustret)-c(13)-c(14)*cnsqdifferenz=0
((decile7-avustret)-c(13)-c(14)*cnsqdifferenz)*cnsqdifferenz=0
(decile8-avustret)-c(15)-c(16)*cnsqdifferenz=0
((decile8-avustret)-c(15)-c(16)*cnsqdifferenz)*cnsqdifferenz=0
(decile9-avustret)-c(17)-c(18)*cnsqdifferenz=0
((decile9-avustret)-c(17)-c(18)*cnsqdifferenz)*cnsqdifferenz=0
(decile10-avustret)-c(19)-c(20)*cnsqdifferenz=0
((decile10-avustret)-c(19)-c(20)*cnsqdifferenz)*cnsqdifferenz=0
(decile1-avustret)-c(2)*c(21)=0
(decile2-avustret)-c(4)*c(21)=0
(decile3-avustret)-c(6)*c(21)=0
(decile4-avustret)-c(8)*c(21)=0
(decile5-avustret)-c(10)*c(21)=0
(decile6-avustret)-c(12)*c(21)=0
(decile7-avustret)-c(14)*c(21)=0
(decile8-avustret)-c(16)*c(21)=0
(decile9-avustret)-c(18)*c(21)=0
(decile10-avustret)-c(20)*c(21)=0

param C(1) -4.960049 C(2) 4.966816 C(3) -4.459504 C(4) 4.464615 C(5) -4.243049 C(6) 4.248657 C(7) -3.791239 C(8) 3.798705 C(9) -3.511227 C(10) 3.518007 C(11) -3.163616 C(12) 3.172926 C(13) -3.030564 C(14) 3.039106 C(15) -2.817843 C(16) 2.826760 C(17) -2.210248 C(18) 2.220781 C(19) -2.225134 C(20) 2.231552 c(21) 1

@inst c
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