EVIEWS tutoria Cointegration an Professor Roy Batchelor	City University Business School I: Oncon d error correction Business School
City University Business S	School, London
& ESCP, ParisY	City University Business School
EVIEWS Tutorial 1	© Roy Batchelor 2000



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Range: 197/	5.01 2000.12	Filter *	Default E	a: None		
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V dy	View Procs	Ubjects Print	Name Freeze	Edit+/- Smpl+/- In	sDel Transpose I	litle Sample
🗹 earn	31.51					
🗹 ft500	obs	obs	FT500	EARN	DIV	RPI
🗹 growth	1999:08	1999:08	14709.42	495.4300	326.5500	166.2C
🗹 infl	1999:09	1999:09	14178.95	505.1300	327.5300	166.50
🗹 pe	1999:10	1999:10	14572.28	501.9700	327.8800	166.7C
prod prod	1999:11	1999:11	15725.26	520.3600	333.3800	167.3C
resid	1999:12	1999:12	16694.16	515.4100	330.5400	166.6C
return	2000:01	2000:01	15612.37	518.5100	329.4200	167.5C
rpi Matha	2000:02	2000:02	15826.98	491.8300	313.3700	168.4C
1 03	2000:03	2000:03	16355.85	521.3900	310.7600	170.1C
	2000:04	2000:04	15784.34	528.4300	310.9500	170.7C
	2000-05	2000:05	15658.66	564.4800	311.6100	171.1C
	2000.00	and the second se		544 1400	309.0700	170 50
	2000:06	2000:06	15769.05	344.1400	505.0r00	170.3C
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	2000:06 2000:07 2000:08	2000:06 2000:07 2000:08	15769.05 15907.72 16525.57	531.5000 556.6000	305.4300 309.0300	170.5C 170.5C 171.7C
	2000:06 2000:07 2000:08 2000:09	2000:06 2000:07 2000:08 2000:09	15769.05 15907.72 16525.57 NA	531.5000 556.6000 NA	305.4300 309.0300 NA	170.5C 170.5C 171.7C NA
	2000:06 2000:07 2000:08 2000:09 2000:10	2000:06 2000:07 2000:08 2000:09 2000:10	15769.05 15907.72 16525.57 NA NA	531.5000 556.6000 NA NA	305.4300 309.0300 NA NA	170.5C 170.5C 171.7C NA







Series LF1500 W/ Ann Proce Objects Pri Augments	orkhile: FT500M ti Name Freeze ed Dickey-Ful	Sample Gent Sheet State or Unit Root Test on LF	Ident Line Bar	
ADF Test Statistic	-1.437515	1% Ontical Value* 5% Ontical Value 10% Ontical Value	-3.4537 -2.8712 -2.5719	ess School
monined: Least aduate	15			
Date: 10/27/00 Time Sample(adjusted): 19: Included observations Variable	19:17 19:17 75:05 2000:08 304 after adju Coefficient	eting endpoints Std. Ennor 1-Statistic	Prob.	hive lft500 has a unit root cannot be rejected
Variable Variable Variable LFT500(-1) D(LFT5D(-1)) D(LFT5D(-3)) C	19:17 75:05 2000:06 304 after adju Coefficient -0.003268 D.054502 -0.155339 -0.065122 D.042113	sting endpoints Std. Error 1-Statistic 0.0396513 0.964427516 0.0595887 -2.833212 0.0595887 -11.85502 0.054954 -11.85502 0.054954 -11.85502	Prob 0.1516 0.3396 0.0049 0.2369 0.0207	lft500 has a unit root cannot be rejected

Asymented Asymented	I Dickey-Fulle	Sample Gent S en Unit Root Ter	ineet State	Ident Line Bar T500)	tre-	is used and interview.
ADF Test Statistic	-9.971815	1% Critical V 5% Critical V 10% Critical V	Yalue* Yalue Yalue	-3.4537 -2.8712 -2.6719	יייב . פר	ss School
'MacHünnon critical va	lues for rejecti	ion of hypothesis	s Xaunit i	raat.	pn	
Dependent Variable: D	2(LET50D.2)					
Method: Least Square Date: 10/27/00 Time Sample(adjusted): 197 ncluded observations: Moriable	19:19 75:06:2000:08 303:after adju	usting endpoints	t Statiotic	Pmb	jn ne:	the first difference of lft500 has a unit root
Method: Least Square Date: 10/27/00 Time Sample(adjusted): 197 Included observations: Variable	19:19 75:06:2000:08 303 after adju Coefficient	sting endpoints Std. Error	1-Statistic	Prob.	Jn ne:	the first difference of lft500 has a unit root <i>can</i> be rejected.
Verhod: Least Square Date: 10.27:00 Time Sample(adjust ed): 197 included observations: Variable D(LFT500(-1)) D(LFT500(-1).2)	5 19:19 506 2000:08 200 after adju Coefficient -1.182676 0.231354	sting endpoints Std. Error 1 0.118802 - 0.096411	1-Statistic -9.971816 2.350890	Pmb.	Jn hei on	the first difference of lft500 has a unit root <i>can</i> be rejected.
Verhod: Least Square Date: 10/27/00 Time Sample(adjusted): 197 ncluded observations: Variable D(LFT500(-1)) D(LFT500(-1),2) D(LFT500(-2),2)	5 19:19 506 2000 08 203 after adju Coefficient -1.182675 0.231354 0.080138	sting endpoints Std. Error 1 0.118802 - 0.096411 0.076309	1-Statistic -9.971816 2.360690 1.023366	Pmb. 0.0000 0.0194 0.3070	Jn hei	the first difference of lft500 has a unit root <i>can</i> be rejected.
Verhod: Least Square Date: 10(27:00 Time Sample(adjusted): 197 ncluded observations: Variable D(LFT500(-1),2) D(LFT500(-1),2) D(LFT500(-3),2) D(LFT500(-3),2)	-19:19 75:06:2000:08 303 after adju Coefficient -1.183675 0.231354 0.080138 0.008348	Std. Error 1 0.118802 - 0.096411 0.076309 0.056129	1-Statistic -9.971816 2.360890 1.023366 0.163666	Pmb. 0.0000 0.0194 0.3070 0.8755	Jn ne: on	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)
Method: Lenst Square Date: 10/2700 Tincit Sample(adjusted): 199 included observations: Variable D(LFT500(-1))2) D(LFT500(-3)2) D(LFT500(-3)2) C	5 19:19 200:00 200:after adju Coefficient -1.183575 0.231354 0.000548 0.000548 0.016749	sting endpoints Std. Error 1 0.118802 0.096411 0.076309 0.056129 0.005331	1-Statistic -9.971816 2.360890 1.023366 0.153666 5.028302	Pmb. 0.0000 0.0194 0.3070 0.6756 0.0000	Jn ne: on Jn	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)
Verlahod: Least Square Date: 10/27/00 Time Sample/doubset/di, 197 included observations: Verlable D(LF1500(-11)) D(LF1500(-12,2) D(LF1500(-3),2) C R-squared	19.19 19.19 75.06 2000.08 303 after adju Coefficient -1.183575 0.231354 0.080138 0.008348 0.016748 0.499503	sting endpoints Std. Enor 1 0.118602 - 0.076309 0.076309 0.056129 0.056129 0.056319 0.056319	1-Statistic -9.971816 2.360890 1.023866 0.158866 5.028302 ant var	Pmb. 0.0000 0.0194 0.3070 0.6755 0.0000 -8.665-05	Jn ne: on Jn	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)
Method: Levet Square Date: 10/27/00 Time Sample/djuet edi, 199 Included observations: Vioriable D(LF1500(-1),2) D(LF1500(-1),2) D(LF1500(-3),2) C C R-squared Adjusted R-squared	19:19 19:19 25:06:2000.08 303 after adju Coefficient -1.182575 0.231354 0.000848 0.000848 0.000848 0.000848 0.016749	sting endpoints Std. Error 1 0.066411 0.076509 0.055129 0.005331 Mean depender S.D. depender	1-Statistic -9.971816 2.350890 1.023366 0.153866 5.028302 ant var di var	Prob. 0.0000 0.0194 0.3070 0.3755 0.0000 -8.685-05 0.035554 0.045556	Jn ne: on Jn	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)
Method: Lenst Square Date: 102/200 Thick Sample(adjusted; 197 Included observations: Variable D(LFT500(-1))2) D(LFT500(-3)2) D(LFT500(-3)2) C R-squared Adjusted R-squared S.E. of regression	19:19 19:19 50:62:200.08 303 after adju Coefficient -1.18:3676 0.23:1354 0.080136 0.008648 0.008648 0.0166748 0.49503 0.49503 0.49503	Std. Enor 1 0.118802 - 0.006411 0.076398 0.056129 0.005231 Mean depender S.D. depender Akaike info prin	1-Statistic -9.971816 2.360800 0.158866 5.028902 ant var di var di var di var	Pmb. 0.0000 0.8756 0.8756 0.0000 8.668-06 0.068564 3.155066 3.056063	in ne: on in ne:	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)
Method: Least Square Date: 10/27/00 Time Sample(a)quarted; 199 Included observations: Variable D(LF1500(-11)) D(LF1500(-12)2) D(LF1500(-3)2) C R-squared Adjusted R-squared SE: of regression Sum squared resid on Kenhord	19:19 19:19 55:66 2000.08 303 after adju Coefficient -1.183676 0.231354 0.008138 0.008648 0.008648 0.008648 0.008648 0.008648 0.008648 0.0493903 0.493903 0.049590 0.049590	sting endpoints Std. Error 1 0.096411 0.076309 0.065129 0.005331 Mean depende S. D. depender Mean depende S. D. depender Mean depende S. D. depender S. depender S. D. depender S. depender S. D. depender S. depender	1-Statistic 9.971816 2.360890 1.023866 0.158866 5.023902 set var it var it var it var iterion iton	Prob. 0.0000 0.0194 0.3070 0.0755 0.0000 8.6885-05 0.035564 3.155066 3.093603 3.155066	Jn ne on Jn ne	the first difference of lft500 has a unit root <i>can</i> be rejected. So lft500 is I(1)



Workfile: FT5					
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View Proce Object	s Save Label+/- S	how Fetch S	xie Delete Geni S	ample	
Range: 1975.01	2000:12 Filte	r: " De	fault Eq. eqD1		
Sample: 1975:01	2000:12				
C C	E ft500m	12	20 rpi		
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M drai	M Inci	1975:01	5.077982	2.651005	-
M ath3	M pe	1975:02	5.291997	2.551868	
🗹 dy	🗹 prod	1975:03	5.231429	2.578422	
Seam.	🗹 res	1975:04	5.387269	2.623944	
Second Contraction of the second s		1025 05	E 151000	0.000200	
🔳 eq01	🗠 resid	19/5:05	9.491802	2.629/20	
■ eq01 21 ft500	⊠ resid ⊠return	1975:05	5.338883	2.644755	
■ eq01 ⊠ #500	⊠ resid ⊠ return	1975:05 1975:06 1975:07	5.338983 5.311579	2.629725 2.644755 2.666757	
■ eq01 27 #500	⊠resid ⊠retum	1975:05 1975:06 1975:07 1975:08	5.338983 5.311579 5.448374	2.629725 2.644755 2.696757 2.665838	
■ eq01 27 #500	M resid M return	1975:05 1975:06 1975:07 1975:08 1975:09	5.491802 5.338863 5.311579 5.448374 5.482055	2.644755 2.666757 2.665838 2.688528	
■ :::01 ≌ #500	M resid M return	1975:05 1975:06 1975:07 1975:08 1975:09 1975:10	5.451622 5.336863 5.311579 5.448374 5.482055 5.630421	2.629/26 2.644755 2.666757 2.665838 2.688528 2.700018	
■ eq01 21 #500	≌ resid So return	1975:05 1975:06 1975:07 1975:08 1975:09 1975:10 1975:11	5.431602 5.338883 5.311579 5.448374 5.482055 5.630421 5.654780	2 644755 2 696757 2 696757 2 695938 2 698528 2.700018 2.712706	
■ aq01 27 #500	⊻ resid ⊠ return	1975:05 1975:06 1975:07 1975:08 1975:09 1975:10 1975:11 1975:12	5.431802 5.338883 5.311579 5.448374 5.482055 5.630421 5.654780 5.600790	2.629726 2.664755 2.666757 2.665698 2.688528 2.700018 2.712708 2.723924	
■ eq01 21 #500	⊻ resid ⊠ return	1975:05 1975:06 1975:07 1975:08 1975:09 1975:10 1975:11 1975:12 1976:01	5.451802 5.3389883 5.311579 5.482055 5.630421 5.660420 5.600790 5.685347	2 664725 2 664755 2 666757 2 665838 2 668528 2 700018 2 712705 2 723924 2 732418	



	D Workfile: F	T500M			×
iew Procs Objects Pri	nt Name Freeze	Estimate Fore	cast Stats R	lesids	
Dependent Variable: L	_FT500				hot
Method: Least Square	es.				100
Date: 11/02/00 Time	: 11:01				
Sample: 1975:01 1999	5:12				1
included observations	. 252				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
c	2.388322	0.040888	58.41105	0.0000	bol
- Summer	1 1 40050	0.000165	105 /075	0 0000	and there is
LDIV	1.149303	0.005105	120,4070	0.0000	
LDIV R-squared	0.984353	Mean depen	dent var	7.395240	- Don't worrs
LDIV R-squared Adjusted R-squared	0.984353	Mean depen S.D. depend	dent var lent var	7.395240	_ Don't worry
LDIV R-squared Adjusted R-squared S.E. of regression	0.984353 0.984290 0.140042	Mean depen S.D. depend Akailee info (dent var ent var criterion	7.395240 1.117301 -1.085842	Don't worry
LDIV R-squared Adjusted R-squared S.E. of regression Sum squared resid	0.984353 0.984290 0.140042 4.902952	Mean depen S.D. depend Akaike info (Schwarz crit	dent var ent var criterion erion	7.395240 1.117301 -1.085842 -1.057830	Don't worry
LDIV R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood	0.984353 0.984290 0.140042 4.902952 138.8160 <	Mean depen S.D. depend Akaile info o Schwarz crit F-statistic	dent var ent var criterion erion	7.395240 1.117301 -1.085842 -1.057830 15727.05	Don't worry about this



Equation: UNTITLED	<i>Cle-Gra</i> Workfile: F	T500M	stage i	two (E	CM) regression
Dependent Variable: D Method: Least Square Date: 11/02/00 Time: Sample(adjusted): 197 Included observations:	DLFT500 s 11:06 '5:03 1995:12 250 after adju	isting endpoin	ts		ichool
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C DLFT500(-1) DLDIV DLDIV(-1) RES(-1)	0.010568 0.059286 0.148933 0.125376 -0.073868	0.005777 0.062509 0.257720 0.255328 0.025 017	1.829286 0.948434 0.577887 0.491037 -2.952702	0.0686 0.3438 0.5639 0.6238 0.0035	sity ichool
R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood Durbin-Watson stat	0.035776 0.020034 0.053443 0.699762 380.0748 1.929673	Mean depen S.D. depend Akaike info o Schwarz crit F-statistic Prob(F-statis	dent var lent var criterion erion stic)	0.014948 0.053987 -3.000598 -2.930169 2.272610 0.062054	About 7% of disequilibrium "corrected" each month

Equation: UNTITLE) Workfile: F	T 500M	i de la fer		1
iew Proce Objects Prin	t Name Fiesze	Estimate Fore	acast Stats R	eaide	versitv
Dependent Variable: L Method: Leget Severe	FT500				a Cahaal
oetriud: Least Square Date: 11/02/00 Time:	11:09				sounder
Sample: 1975:01 1999	:12				
ncluded observations:	252				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	4.438814	1.006762	4.40B999	0.0000	versity
LDIV	0.824636	0.070706	11.66295	0.0000	La Charles and
LEARN	0.400457	0.065511	6.112845	0.0000	IS SCHOOL
LPROD	-D.603047	0.210528	-2.864443	0.0045	
LRPI	0.041873	0.105460	0.397051	0.6917	
CONF	0.005704	0.000478	11.93730	0.0000	
163	-1,85/2/9	0.271673	-6.836465	0.0000	
R-squared	0.993328	Mean depen	dent var	7.395240	an exits a
Adjusted R-squared	0.993164	S.D. depend	lent var	1.117301	Let St A
S.E. of regression	D.092376	Akaike info	oriterion	-1.898520	la Cahaat
Sum squared resid	2.090654	Schwarz crit	terion	-1.800480	SIGUIDOL
_og likelihood	245.2135	F-statistic		6079.104	
	D AF 40 DO	Duck/E stati.	(aite	d doopdo	

Equation UNTITLE) Worklife F	15004		1
View Proce Objects Prin	1 Name Freeze	Estimate Forecast Stats	Reaids	
Dependent Variable: [LFT500	27		niversity
Method: Least Square	8			ace School
Date 11/02/00 Time Sample/adjusted: 191	11:13 (5:03:1995:17			ess oundut
Included observations:	250 after adju	usting endpoints		17 ¹
Variable	Coefficient	Std Error t-Statist	ic Preb	
c	0.008040	0.005069 1.68917	78 D.1133	
DLFT500(-1)	0.075496	0.060525 1.24736	61 0.2135	nivorcity
DEDIV	0.296524	0.252421 1.12514	43 0.2612	merony
DLEARN	0.068621	0.127303 0.53904	40 0.5904	loce School
DLPROD	0.289909	0.224798 1.2896	40 0.1984	reaa oonoot
DERPI	0.044388	0.454291 0.09770	18 0.9222	10 ⁻²
DUCONF	0.001385	D.000500 2.7580	13 0.0051	1 ¹¹
RES(-1)	-0.152015	0.037486 -4.05528	39 0.0001	
R. seuared	0.195254	Meen dependent var	0.014948	and a second data of the second
Adjusted R-souared	0.168540	S.D. dependent var	0.053987	niversity
S.E. of regression	0.049227	Akaike into criterion	-3.149394	0.1.1
Sum squared resid	0.584026	Schwarz criterion	-3.022622	less School
Log likelihood	402.6743	F-statistic	7.30915B	
Durbin Watson stat	1.935520	Prob(F-statistic)	0.000000	

in the time	o working. I	1500M	1 1		
View Proce Objects Prin	k Name Freeze	Estimate Fores	asl Stats Re	esids	ersity
Dependent Variable: D)LFT500				School
Niethod: Least Square Date: 11/02/00 Time	11.14				10001000
Sample/adjusted): 197	75.02 1996 12				1
Included observations:	251 after adju	isting endpoints	i.		1
Variable	Confficient	Std Erro-	t Statistic	Deah	
Yanabis	COBINCIBILI	ato, Enor	r-dratistic	FIOD.	oreitu
c	0.015636	0.003412	4.582869	0.0000	er si di
DCONF	0.001246	0.000523	2.381235	0.0180	School
RES(1)	-0.128131	0.038385	-3.338063	0.0010	
(ceo(-i)					
R-souared	0.053258	Mean depend	ent var	0.015741	
R-squared Adjusted R-squared	0.053258	Mean depend S.D. depende	ent var nt var	0.015741 0.055324	
R-squared Adjusted R-squared S.E. of regression	0.053258 0.045623 0.054048	Mean depend S.D. depende Akaike infolor	ent var nt var iterion	0.015741 0.055324 -2.986023	
R-squared Adjusted R-squared S.E. of regression Sum squared resid	0.053258 0.045623 0.054048 0.724444	Mean depende S.D. depende Akaike info or Schwarz crite	ent var nt var iterion rion	0.015741 0.055324 -2.986023 -2.943886	orcitu
R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood	0.053258 0.045623 0.054048 0.724444 377.7459	Mean depend S.D. depende Akaike info or Schwarz orite F-statistic	ent var nt var iterion rion	0.015741 0.055324 -2.986023 -2.943886 6.975430	ersity











ew Procs Objec	ts <u>Print Name</u>	Freeze Sample S	heet Stats Spec		-
ncluded observ est assumption Series: LFT500 Lags interval: 1	rations: 250 n: Linear deterr LDIV to 1	ninistic trend in t	he data	Hynothesized	ol
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)	
N 06690.4	25.25193	15.41	20.04	None **	









Aex Specily/Estimate	e ecce Estimate Stats Inpulse Reside and in the second distance
Make Besidual	Correction Estimates
Dal Make Endogen	Model: UNTITLED Workfile: FT500M
included observatio	197
endpoints Disadard comes 2	
atandaro errors &.	
Cointegrating Eq.	CD(LFT500) = - 0.1076813488*(LFT500(-1) - 1.154485384*LDIV(-1) - 2.366872291) -
LFT500(-1)	0.05958940158*D(LFT500(-1)) + 0.1307521497*D(LDIV(-1)) + 0.007862995094 +
I DD # 41	U.0971976494110LEARN + 0.323051695410LPROD - 0.013334906/610LRPI + 0.000491049478*CONE + 0.0007023038808*DCONE - 0.02283939447*TB3 -
LUIV(-1)	12.384705363*DTB3
	6
С	D(LDIV) = 0.02298165152*(LFT500(-1) - 1.154485384*LDIV(-1) - 2.366872291) -
East Connetion	U.U177566260110(LF1500(-1)) - 0.053181699110(LDIV(-1)) + 0.001100193426 +
Circle Confection	9 301065471e-06*CONE - 0 0001300795635*DCONE + 0 09747851488*TB3 -
	0.0010004110100 00141 0.0001000100000 000041 1.0.00147001400 TD0 *







