THE STABILITY OF MONETARY AGGREGATES IN JAPAN:

AN ECONOMETRIC INVESTIGATION

by

Berch Haroian, Ph.D.
Professor of Economics, Finance and Global Business
William Paterson University
C. M. Cotsakos College of Business
1600 Valley Road
P.O. Box 920
Wayne, NJ 07474-0920, USA
e-mail: HaroianB@wpunj.edu
Telephone: (973) 720-2411

and

Elias C.Grivoyannis
Associate Professor of Economics
Yeshiva University
500 West 185th Street
New York, NY 10033-3201, USA
e-mail: grivoyan@yu.edu
Telephone: (212) 960-5339

Prepared for Presentation
At the Inaugural International Conference on Business, Banking and Finance
At the University of the West Indies, Trinidad and Tobago
April 27-29, 2004

VECTOR ERROR CORRECTION (VEC) ESTIMATES
Of Japan's Demand for Money function

Vector Error Correction Estimates
Date: 02/19/03 Time: 23:39
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNJRM1(-1)	1.000000
LNJRGDP(-1)	-0.975579 (0.70547) [-1.38288]
JRCR(-1)	-0.125691 (0.05301) [-2.37086]
C	1.426662

Error Correction:	D(LNJRM1)	D(LNJRGDP)	D(JRCR)
CointEq1	0.025488 (0.00755) [3.37374]	-0.002653 (0.00223) [-1.18983]	0.517144 (0.20485) [2.52447]
D(LNJRM1(-1))	-0.013277 (0.11298) [-0.11752]	0.006544 (0.03334) [0.19629]	-5.987421 (3.06346) [-1.95447]
D(LNJRM1(-2))	-0.196527 (0.11169) [-1.75954]	0.018612 (0.03296) [0.56468]	-2.368641 (3.02860) [-0.78209]
D(LNJRGDP(-1))	0.276875 (0.40393) [0.68545]	0.186892 (0.11920) [1.56787]	8.783107 (10.9528) [0.80190]
D(LNJRGDP(-2))	-0.331659 (0.40611) [-0.81668]	0.187884 (0.11984) [1.56775]	10.65387 (11.0119) [0.96749]
D(JRCR(-1))	-0.000302 (0.00406) [-0.07441]	-0.000551 (0.00120) [-0.45968]	-0.278336 (0.11005) [-2.52909]
D(JRCR(-2))	4.10E-05 (0.00408) [0.01005]	-0.000118 (0.00120) [-0.09754]	0.047573 (0.11072) [0.42968]
C	0.020426	0.003425	-0.101352

	(0.00496)	(0.00146)	(0.13438)
	[4.12168]	[2.34195]	[-0.75421]
R-squared	0.192049	0.148329	0.168204
Adj. R-squared	0.121353	0.073807	0.095422
Sum sq. resids	0.051433	0.004479	37.81598
S.E. equation	0.025356	0.007482	0.687532
F-statistic	2.716555	1.990420	2.311066
Log likelihood	202.7055	310.1037	-87.70396
Akaike AIC	-4.425126	-6.865993	2.175090
Schwarz SC	-4.199913	-6.640781	2.400302
Mean dependent	0.016817	0.006235	-0.091588
S.D. dependent	0.027050	0.007775	0.722886
Determinant Residual Covariance		1.46E-08	
Log Likelihood		431.8430	
Log Likelihood (d.f. adjusted)		419.2621	
Akaike Information Criteria		-8.915047	
Schwarz Criteria		-8.154955	

Vector Error Correction Estimates
Date: 02/19/03 Time: 23:46
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNJRM1(-1)	1.000000
LNJRGDP(-1)	-2.133205
	(1.17918)
	[-1.80905]
JRGB10Y(-1)	-0.281558
	(0.11579)
	[-2.43165]
C	11.97327

Error Correction:	D(LNJRM1)	D(LNJRGDP)	D(JRGB10Y)
CointEq1	0.022189	-0.001537	0.298722
	(0.00603)	(0.00181)	(0.16387)
	[3.67723]	[-0.85028]	[1.82292]
D(LNJRM1(-1))	-0.015866	-0.001515	-0.978460
	(0.11264)	(0.03374)	(3.05892)
	[-0.14086]	[-0.04491]	[-0.31987]
D(LNJRM1(-2))	-0.177095	0.012638	-4.638918
	(0.10650)	(0.03190)	(2.89224)
	[-1.66285]	[0.39619]	[-1.60392]
D(LNJRGDP(-1))	0.207718	0.182919	5.521184
	(0.38089)	(0.11409)	(10.3440)
	[0.54534]	[1.60333]	[0.53376]

D(LNJRGDP(-2))	-0.364924	0.216519	10.62754
	(0.38049)	(0.11397)	(10.3331)
	[-0.95908]	[1.89985]	[1.02850]
D(JRGB10Y(-1))	0.002207	9.46E-05	-0.498194
	(0.00421)	(0.00126)	(0.11441)
	[0.52392]	[0.07493]	[-4.35446]
D(JRGB10Y(-2))	0.001984	-0.000531	-0.149891
	(0.00407)	(0.00122)	(0.11061)
	[0.48709]	[-0.43556]	[-1.35509]
C	0.021057	0.003549	-0.112382
	(0.00478)	(0.00143)	(0.12981)
	[4.40526]	[2.47891]	[-0.86572]
R-squared	0.208879	0.140894	0.278282
Adj. R-squared	0.139656	0.065722	0.215131
Sum sq. resids	0.050361	0.004518	37.14167
S.E. equation	0.025090	0.007515	0.681374
F-statistic	3.017482	1.874291	4.406651
Log likelihood	203.6318	309.7213	-86.91231
Akaike AIC	-4.446177	-6.857301	2.157098
Schwarz SC	-4.220964	-6.632089	2.382310
Mean dependent	0.016817	0.006235	-0.065497
S.D. dependent	0.027050	0.007775	0.769108
Determinant Residual Covariance		1.54E-08	
Log Likelihood		429.3670	
Log Likelihood (d.f. adjusted)		416.7860	
Akaike Information Criteria		-8.858773	
Schwarz Criteria		-8.098681	

Vector Error Correction Estimates
Date: 02/19/03 Time: 23:48
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNJRM2(-1)	1.000000
LNJRGDP(-1)	1.691764
	(0.48697)
	[3.47407]
JRGB10Y(-1)	0.284567
	(0.04384)
	[6.49054]
C	-23.90574

Error Correction:	D(LNJRM2)	D(LNJRGDP)	D(JRGB10Y)

CointEq1	-0.018387	-0.002670	-0.676901
	(0.00288)	(0.00317)	(0.29783)
	[-6.39360]	[-0.84343]	[-2.27278]
D(LNJRM2(-1))	0.117748	-0.098189	-22.44787
	(0.13117)	(0.14440)	(13.5841)
	[0.89766]	[-0.67996]	[-1.65251]
D(LNJRM2(-2))	0.074920	0.289418	7.714494
	(0.11011)	(0.12122)	(11.4033)
	[0.68039]	[2.38752]	[0.67651]
D(LNJRGDP(-1))	0.211375	0.158160	4.206579
	(0.09998)	(0.11007)	(10.3543)
	[2.11408]	[1.43690]	[0.40626]
D(LNJRGDP(-2))	0.172644	0.176586	11.22857
	(0.10244)	(0.11277)	(10.6083)
	[1.68538]	[1.56589]	[1.05847]
D(JRGB10Y(-1))	0.002620	0.001807	-0.263975
	(0.00160)	(0.00176)	(0.16563)
	[1.63803]	[1.02643]	[-1.59374]
D(JRGB10Y(-2))	0.001545	-0.001116	-0.091975
	(0.00119)	(0.00131)	(0.12291)
	[1.30139]	[-0.85436]	[-0.74831]
C	0.007512	0.001960	-0.004220
	(0.00148)	(0.00163)	(0.15304)
	[5.08362]	[1.20498]	[-0.02758]
R-squared	0.562058	0.217558	0.292424
Adj. R-squared	0.523738	0.149094	0.230512
Sum sq. resids	0.003395	0.004115	36.41384
S.E. equation	0.006515	0.007172	0.674665
F-statistic	14.66751	3.177713	4.723161
Log likelihood	322.2914	313.8341	-86.04152
Akaike AIC	-7.142987	-6.950774	2.137307
Schwarz SC	-6.917774	-6.725562	2.362520
Mean dependent	0.011964	0.006235	-0.065497
S.D. dependent	0.009440	0.007775	0.769108

Determinant Residual Covariance	5.80E-10
Log Likelihood	573.7776
Log Likelihood (d.f. adjusted)	561.1966
Akaike Information Criteria	-12.14083
Schwarz Criteria	-11.38074

Vector Error Correction Estimates
Date: 02/19/03 Time: 23:49
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNJRM2(-1)	1.000000
LNJRGDP(-1)	-3.357053 (0.42495) [-7.89983]
JRCR(-1)	-0.096633 (0.02780) [-3.47540]
C	20.07770

Error Correction:	D(LNJRM2)	D(LNJRGDP)	D(JRCR)
CointEq1	0.020622 (0.00518) [3.97934]	0.005294 (0.00521) [1.01621]	0.667171 (0.49118) [1.35830]
D(LNJRM2(-1))	0.249520 (0.13419) [1.85939]	0.006127 (0.13490) [0.04542]	-28.61010 (12.7192) [-2.24936]
D(LNJRM2(-2))	0.006707 (0.12132) [0.05528]	0.175621 (0.12196) [1.44000]	25.85374 (11.4992) [2.24830]
D(LNJRGDP(-1))	0.226325 (0.11220) [2.01718]	0.167724 (0.11279) [1.48710]	-0.338170 (10.6344) [-0.03180]
D(LNJRGDP(-2))	0.115735 (0.11531) [1.00366]	0.179394 (0.11592) [1.54760]	3.588957 (10.9296) [0.32837]
D(JRCR(-1))	-0.001194 (0.00147) [-0.81431]	-0.000375 (0.00147) [-0.25433]	-0.044543 (0.13899) [-0.32047]
D(JRCR(-2))	0.000378 (0.00133) [0.28366]	-0.001062 (0.00134) [-0.79266]	0.002964 (0.12635) [0.02346]
C	0.006690 (0.00185) [3.61027]	0.001780 (0.00186) [0.95552]	-0.079142 (0.17564) [-0.45059]
R-squared	0.470961	0.211895	0.189509
Adj. R-squared	0.424670	0.142935	0.118591
Sum sq. resids	0.004102	0.004145	36.84741
S.E. equation	0.007160	0.007198	0.678670
F-statistic	10.17394	3.072753	2.672225
Log likelihood	313.9765	313.5167	-86.56232
Akaike AIC	-6.954011	-6.943562	2.149144
Schwarz SC	-6.728799	-6.718350	2.374356
Mean dependent	0.011964	0.006235	-0.091588

S.D. dependent	0.009440	0.007775	0.722886
Determinant Residual Covariance		7.91E-10	
Log Likelihood		560.1135	
Log Likelihood (d.f. adjusted)		547.5326	
Akaike Information Criteria		-11.83029	
Schwarz Criteria		-11.07019	

Augmented Dickey-Fuller (ADF) Unit Root Tests
For the explanatory variables of Japan's Money Demand function

Null Hypothesis: JCR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.732962	0.4114
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JCR)
Method: Least Squares
Date: 02/19/03 Time: 20:20
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JCR(-1)	-0.032193	0.018577	-1.732962	0.0866
D(JCR(-1))	0.497148	0.090472	5.495053	0.0000
C	0.079977	0.093846	0.852211	0.3964

R-squared	0.260020	Mean dependent var	-0.081029
Adjusted R-squared	0.243392	S.D. dependent var	0.636531
S.E. of regression	0.553675	Akaike info criterion	1.687587
Sum squared resid	27.28348	Schwarz criterion	1.769819
Log likelihood	-74.62901	F-statistic	15.63680
Durbin-Watson stat	1.837522	Prob(F-statistic)	0.000002

Null Hypothesis: D(JCR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.764008	0.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JCR,2)
Method: Least Squares
Date: 02/19/03 Time: 19:56
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JCR(-1))	-0.522917	0.090721	-5.764008	0.0000
C	-0.047792	0.058705	-0.814112	0.4177

R-squared	0.269622	Mean dependent var	-0.011362
Adjusted R-squared	0.261506	S.D. dependent var	0.651421
S.E. of regression	0.559803	Akaike info criterion	1.699035
Sum squared resid	28.20411	Schwarz criterion	1.753856
Log likelihood	-76.15559	F-statistic	33.22379
Durbin-Watson stat	1.811436	Prob(F-statistic)	0.000000

Null Hypothesis: D(JCR,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.880004	0.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JCR,3)
Method: Least Squares
Date: 02/19/03 Time: 20:28
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JCR(-1),2)	-1.479695	0.149767	-9.880004	0.0000
D(JCR(-1),3)	0.321992	0.099709	3.229300	0.0017
C	-0.016008	0.064539	-0.248039	0.8047

R-squared	0.605781	Mean dependent var	0.002732
Adjusted R-squared	0.596922	S.D. dependent var	0.974704
S.E. of regression	0.618824	Akaike info criterion	1.910074
Sum squared resid	34.08197	Schwarz criterion	1.992307
Log likelihood	-84.86342	F-statistic	68.38148
Durbin-Watson stat	2.004906	Prob(F-statistic)	0.000000

Null Hypothesis: JGB10Y has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.054127	0.7308
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGB10Y)
Method: Least Squares
Date: 02/19/03 Time: 20:21
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JGB10Y(-1)	-0.020366	0.019320	-1.054127	0.2946
C	0.010949	0.104979	0.104299	0.9172

R-squared	0.012196	Mean dependent var	-0.088152
Adjusted R-squared	0.001220	S.D. dependent var	0.448341
S.E. of regression	0.448068	Akaike info criterion	1.253754
Sum squared resid	18.06881	Schwarz criterion	1.308576
Log likelihood	-55.67269	F-statistic	1.111185
Durbin-Watson stat	2.245461	Prob(F-statistic)	0.294646

Null Hypothesis: D(JGB10Y) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.84053	0.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGB10Y,2)
Method: Least Squares
Date: 02/19/03 Time: 20:22
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JGB10Y(-1))	-1.122486	0.103545	-10.84053	0.0000
C	-0.097907	0.047364	-2.067114	0.0416

R-squared	0.566301	Mean dependent var	-0.008514
Adjusted R-squared	0.561482	S.D. dependent var	0.675560
S.E. of regression	0.447361	Akaike info criterion	1.250597
Sum squared resid	18.01185	Schwarz criterion	1.305418
Log likelihood	-55.52745	F-statistic	117.5171
Durbin-Watson stat	2.066805	Prob(F-statistic)	0.000000

Null Hypothesis: D(JGB10Y,2) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.60912	0.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGB10Y,3)
Method: Least Squares
Date: 02/19/03 Time: 20:30
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JGB10Y(-1),2)	-2.886886	0.272114	-10.60912	0.0000
D(JGB10Y(-1),3)	1.007358	0.194043	5.191419	0.0000
D(JGB10Y(-2),3)	0.281009	0.100085	2.807694	0.0061
C	-0.023695	0.051310	-0.461804	0.6454

R-squared	0.827019	Mean dependent var	-0.006812
Adjusted R-squared	0.821122	S.D. dependent var	1.162274
S.E. of regression	0.491572	Akaike info criterion	1.460089
Sum squared resid	21.26461	Schwarz criterion	1.569732
Log likelihood	-63.16411	F-statistic	140.2419
Durbin-Watson stat	1.993035	Prob(F-statistic)	0.000000

Null Hypothesis: JGDP has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.742177	0.4067
Test critical values:	1% level	-3.506484	
	5% level	-2.894716	
	10% level	-2.584529	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGDP)
Method: Least Squares
Date: 02/19/03 Time: 20:24
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JGDP(-1)	-0.007046	0.004044	-1.742177	0.0852
D(JGDP(-1))	0.187876	0.105619	1.778819	0.0789
D(JGDP(-2))	0.213145	0.104629	2.037140	0.0448
D(JGDP(-3))	0.240254	0.104757	2.293438	0.0244
C	3947.056	1932.597	2.042358	0.0443

R-squared	0.382814	Mean dependent var	2860.611
Adjusted R-squared	0.353070	S.D. dependent var	3850.388
S.E. of regression	3096.942	Akaike info criterion	18.96936
Sum squared resid	7.96E+08	Schwarz criterion	19.11012
Log likelihood	-829.6517	F-statistic	12.87034
Durbin-Watson stat	2.010120	Prob(F-statistic)	0.000000

Null Hypothesis: D(JGDP) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.444600	0.1327
Test critical values:	1% level	-3.506484	
	5% level	-2.894716	
	10% level	-2.584529	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGDP,2)
Method: Least Squares
Date: 02/19/03 Time: 20:24
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JGDP(-1))	-0.262416	0.107345	-2.444600	0.0166
D(JGDP(-1),2)	-0.514879	0.121658	-4.232193	0.0001
D(JGDP(-2),2)	-0.268547	0.104737	-2.564014	0.0121
C	675.0454	461.1301	1.463893	0.1470

R-squared	0.395069	Mean dependent var	-48.71170
Adjusted R-squared	0.373464	S.D. dependent var	3959.666
S.E. of regression	3134.234	Akaike info criterion	18.98255
Sum squared resid	8.25E+08	Schwarz criterion	19.09515
Log likelihood	-831.2320	F-statistic	18.28627
Durbin-Watson stat	2.023217	Prob(F-statistic)	0.000000

Null Hypothesis: D(JGDP,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.60159	0.0001
Test critical values:	1% level	-3.506484	
	5% level	-2.894716	
	10% level	-2.584529	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JGDP,3)
Method: Least Squares
Date: 02/19/03 Time: 20:25
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JGDP(-1),2)	-2.044124	0.176193	-11.60159	0.0000
D(JGDP(-1),3)	0.354946	0.101439	3.499126	0.0007
C	-101.6088	343.8691	-0.295487	0.7683

R-squared	0.785245	Mean dependent var	0.985682
Adjusted R-squared	0.780192	S.D. dependent var	6878.020
S.E. of regression	3224.671	Akaike info criterion	19.02855
Sum squared resid	8.84E+08	Schwarz criterion	19.11300
Log likelihood	-834.2560	F-statistic	155.3997
Durbin-Watson stat	2.071333	Prob(F-statistic)	0.000000

Null Hypothesis: JM1 has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.063687	1.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM1)
Method: Least Squares
Date: 02/19/03 Time: 20:31
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JM1(-1)	0.050698	0.016548	3.063687	0.0030
D(JM1(-1))	0.332937	0.117994	2.821646	0.0060
D(JM1(-2))	-0.306217	0.138546	-2.210216	0.0299
D(JM1(-3))	0.093901	0.218823	0.429121	0.6690
D(JM1(-4))	0.687312	0.199396	3.446977	0.0009
D(JM1(-5))	-0.842158	0.194140	-4.337885	0.0000
D(JM1(-6))	-0.141380	0.235870	-0.599397	0.5506
D(JM1(-7))	-0.671429	0.242807	-2.765275	0.0070
D(JM1(-8))	0.524359	0.244039	2.148670	0.0346
C	-3287.894	1234.214	-2.663958	0.0093

R-squared	0.682724	Mean dependent var	2890.683
Adjusted R-squared	0.647902	S.D. dependent var	6119.341
S.E. of regression	3631.087	Akaike info criterion	19.33477
Sum squared resid	1.08E+09	Schwarz criterion	19.60888
Log likelihood	-879.3996	F-statistic	19.60560
Durbin-Watson stat	1.977328	Prob(F-statistic)	0.000000

Null Hypothesis: D(JM1) has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.002705	0.9964
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM1,2)
Method: Least Squares
Date: 02/19/03 Time: 20:32
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JM1(-1))	0.258843	0.258145	1.002705	0.3189
D(JM1(-1),2)	-0.719112	0.272524	-2.638708	0.0099
D(JM1(-2),2)	-0.961979	0.308706	-3.116167	0.0025
D(JM1(-3),2)	-0.649466	0.304047	-2.136070	0.0356
D(JM1(-4),2)	0.161400	0.311017	0.518943	0.6052
D(JM1(-5),2)	-0.535388	0.277824	-1.927079	0.0574
D(JM1(-6),2)	-0.392713	0.259322	-1.514380	0.1337
D(JM1(-7),2)	-0.875662	0.226043	-3.873871	0.0002
C	-30.90292	657.8989	-0.046972	0.9626

R-squared	0.755109	Mean dependent var	17.89312
Adjusted R-squared	0.731505	S.D. dependent var	7353.091
S.E. of regression	3810.113	Akaike info criterion	19.42141
Sum squared resid	1.20E+09	Schwarz criterion	19.66811
Log likelihood	-884.3848	F-statistic	31.99081
Durbin-Watson stat	2.055286	Prob(F-statistic)	0.000000

Null Hypothesis: D(JM1,2) has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.869570	0.0001
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM1,3)
Method: Least Squares
Date: 02/19/03 Time: 20:33
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JM1(-1),2)	-3.588731	0.736971	-4.869570	0.0000
D(JM1(-1),3)	2.123253	0.710886	2.986771	0.0037
D(JM1(-2),3)	1.439897	0.719167	2.002174	0.0485
D(JM1(-3),3)	1.040146	0.675574	1.539647	0.1274
D(JM1(-4),3)	1.439497	0.526698	2.733058	0.0076
D(JM1(-5),3)	1.088950	0.379383	2.870316	0.0052
D(JM1(-6),3)	0.805874	0.215068	3.747061	0.0003
C	488.2051	405.9807	1.202533	0.2325

R-squared	0.908012	Mean dependent var	35.75761
Adjusted R-squared	0.900347	S.D. dependent var	12069.97
S.E. of regression	3810.236	Akaike info criterion	19.41171
Sum squared resid	1.22E+09	Schwarz criterion	19.63100
Log likelihood	-884.9387	F-statistic	118.4524
Durbin-Watson stat	2.024742	Prob(F-statistic)	0.000000

Null Hypothesis: JM2_CD01 has a unit root
Exogenous: Constant
Lag Length: 5 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.031786	0.7391
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM2_CD01)
Method: Least Squares
Date: 02/19/03 Time: 20:34
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JM2_CD01(-1)	-0.001846	0.001789	-1.031786	0.3051
D(JM2_CD01(-1))	0.604502	0.102699	5.886149	0.0000
D(JM2_CD01(-2))	-0.101727	0.111852	-0.909474	0.3657
D(JM2_CD01(-3))	0.062682	0.113104	0.554195	0.5809
D(JM2_CD01(-4))	0.494718	0.114329	4.327154	0.0000
D(JM2_CD01(-5))	-0.331593	0.106883	-3.102382	0.0026
C	2228.173	1032.250	2.158559	0.0337

R-squared	0.526442	Mean dependent var	5252.093
Adjusted R-squared	0.493014	S.D. dependent var	3549.518
S.E. of regression	2527.362	Akaike info criterion	18.58078
Sum squared resid	5.43E+08	Schwarz criterion	18.77265
Log likelihood	-847.7157	F-statistic	15.74869
Durbin-Watson stat	1.971862	Prob(F-statistic)	0.000000

Null Hypothesis: D(JM2_CD01) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.631028	0.0905
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM2_CD01,2)
Method: Least Squares
Date: 02/19/03 Time: 20:35
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JM2_CD01(-1))	-0.260009	0.098824	-2.631028	0.0101
D(JM2_CD01(-1),2)	-0.127100	0.126922	-1.001402	0.3194
D(JM2_CD01(-2),2)	-0.230240	0.121292	-1.898234	0.0610
D(JM2_CD01(-3),2)	-0.164280	0.114142	-1.439250	0.1537
D(JM2_CD01(-4),2)	0.334455	0.106888	3.129036	0.0024
C	1350.921	585.5869	2.306952	0.0235

R-squared	0.393651	Mean dependent var	-37.87609
Adjusted R-squared	0.358399	S.D. dependent var	3156.441
S.E. of regression	2528.310	Akaike info criterion	18.57148
Sum squared resid	5.50E+08	Schwarz criterion	18.73595
Log likelihood	-848.2882	F-statistic	11.16652
Durbin-Watson stat	1.967770	Prob(F-statistic)	0.000000

Null Hypothesis: D(JM2_CD01,2) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.228685	0.0000
Test critical values:	1% level	-3.503049	
	5% level	-2.893230	
	10% level	-2.583740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JM2_CD01,3)
Method: Least Squares
Date: 02/19/03 Time: 20:35
Sample: 1980:1 2002:4
Included observations: 92

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JM2_CD01(-1),2)	-1.712299	0.327482	-5.228685	0.0000
D(JM2_CD01(-1),3)	0.380376	0.260095	1.462452	0.1472
D(JM2_CD01(-2),3)	-0.008986	0.185127	-0.048538	0.9614
D(JM2_CD01(-3),3)	-0.276808	0.108120	-2.560194	0.0122
C	-24.76423	272.4914	-0.090881	0.9278

R-squared	0.727549	Mean dependent var	7.961232
Adjusted R-squared	0.715022	S.D. dependent var	4894.690
S.E. of regression	2612.948	Akaike info criterion	18.62716
Sum squared resid	5.94E+08	Schwarz criterion	18.76421
Log likelihood	-851.8494	F-statistic	58.08076
Durbin-Watson stat	1.935258	Prob(F-statistic)	0.000000

Null Hypothesis: JRCR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.300275	0.1742
Test critical values:	1% level	-3.505595	
	5% level	-2.894332	
	10% level	-2.584325	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRCR)
Method: Least Squares
Date: 02/19/03 Time: 23:59
Sample(adjusted): 1980:4 2002:4
Included observations: 89 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JRCR(-1)	-0.065624	0.028529	-2.300275	0.0239
D(JRCR(-1))	-0.257499	0.100903	-2.551938	0.0125
C	0.094916	0.125396	0.756927	0.4512

R-squared	0.124320	Mean dependent var	-0.107509
Adjusted R-squared	0.103955	S.D. dependent var	0.734292
S.E. of regression	0.695078	Akaike info criterion	2.143542
Sum squared resid	41.54951	Schwarz criterion	2.227429
Log likelihood	-92.38762	F-statistic	6.104698
Durbin-Watson stat	1.910355	Prob(F-statistic)	0.003318

Null Hypothesis: D(JRCR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.24782	0.0001
Test critical values:	1% level	-3.505595	
	5% level	-2.894332	
	10% level	-2.584325	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRCR,2)
Method: Least Squares
Date: 02/20/03 Time: 00:01
Sample(adjusted): 1980:4 2002:4
Included observations: 89 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JRCR(-1))	-1.265251	0.103304	-12.24782	0.0000
C	-0.137054	0.076345	-1.795183	0.0761

R-squared	0.632925	Mean dependent var	0.003876
Adjusted R-squared	0.628706	S.D. dependent var	1.168503
S.E. of regression	0.712014	Akaike info criterion	2.180778
Sum squared resid	44.10590	Schwarz criterion	2.236702
Log likelihood	-95.04462	F-statistic	150.0091
Durbin-Watson stat	1.911673	Prob(F-statistic)	0.000000

Null Hypothesis: D(JRCR,2) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.48538	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRCR,3)
Method: Least Squares
Date: 02/20/03 Time: 00:02
Sample(adjusted): 1981:3 2002:4
Included observations: 86 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JRCR(-1),2)	-3.160895	0.301457	-10.48538	0.0000
D(JRCR(-1),3)	1.071168	0.224670	4.767743	0.0000
D(JRCR(-2),3)	0.336573	0.104038	3.235087	0.0018
C	0.037262	0.081949	0.454691	0.6505

R-squared	0.880132	Mean dependent var	0.012195
Adjusted R-squared	0.875746	S.D. dependent var	2.153381
S.E. of regression	0.759059	Akaike info criterion	2.331921
Sum squared resid	47.24600	Schwarz criterion	2.446077
Log likelihood	-96.27260	F-statistic	200.6948
Durbin-Watson stat	2.045615	Prob(F-statistic)	0.000000

Null Hypothesis: JRGB10Y has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.837566	0.8032
Test critical values:	1% level	-3.505595	
	5% level	-2.894332	
	10% level	-2.584325	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRGB10Y)
Method: Least Squares
Date: 02/20/03 Time: 00:03
Sample(adjusted): 1980:4 2002:4
Included observations: 89 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JRGB10Y(-1)	-0.031292	0.037361	-0.837566	0.4046
D(JRGB10Y(-1))	-0.446453	0.097203	-4.593014	0.0000
C	0.058182	0.184819	0.314803	0.7537

R-squared	0.220892	Mean dependent var	-0.057224
Adjusted R-squared	0.202773	S.D. dependent var	0.768698
S.E. of regression	0.686351	Akaike info criterion	2.118273
Sum squared resid	40.51272	Schwarz criterion	2.202159
Log likelihood	-91.26313	F-statistic	12.19131
Durbin-Watson stat	2.113765	Prob(F-statistic)	0.000022

Null Hypothesis: D(JRGB10Y) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-15.40167	0.0001
Test critical values:	1% level	-3.505595	
	5% level	-2.894332	
	10% level	-2.584325	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRGB10Y,2)
Method: Least Squares
Date: 02/20/03 Time: 00:04
Sample(adjusted): 1980:4 2002:4
Included observations: 89 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JRGB10Y(-1))	-1.463067	0.094994	-15.40167	0.0000
C	-0.084044	0.072836	-1.153872	0.2517

R-squared	0.731657	Mean dependent var	0.000693
Adjusted R-squared	0.728572	S.D. dependent var	1.315143
S.E. of regression	0.685173	Akaike info criterion	2.103925
Sum squared resid	40.84319	Schwarz criterion	2.159849
Log likelihood	-91.62465	F-statistic	237.2115
Durbin-Watson stat	2.130695	Prob(F-statistic)	0.000000

Null Hypothesis: D(JRGB10Y,2) has a unit root
Exogenous: Constant
Lag Length: 5 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.897970	0.0000
Test critical values:	1% level	-3.511262	
	5% level	-2.896779	
	10% level	-2.585626	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(JRGB10Y,3)
Method: Least Squares
Date: 02/20/03 Time: 00:05
Sample(adjusted): 1982:2 2002:4
Included observations: 83 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(JRGB10Y(-1),2)	-6.495982	0.822488	-7.897970	0.0000
D(JRGB10Y(-1),3)	4.141130	0.753754	5.494006	0.0000
D(JRGB10Y(-2),3)	2.862151	0.627799	4.559021	0.0000
D(JRGB10Y(-3),3)	1.768352	0.455434	3.882788	0.0002
D(JRGB10Y(-4),3)	0.979245	0.271056	3.612699	0.0005
D(JRGB10Y(-5),3)	0.293659	0.110395	2.660074	0.0095
C	-0.011682	0.079998	-0.146029	0.8843

R-squared	0.920986	Mean dependent var	0.006883
Adjusted R-squared	0.914749	S.D. dependent var	2.495272
S.E. of regression	0.728566	Akaike info criterion	2.285090
Sum squared resid	40.34142	Schwarz criterion	2.489089
Log likelihood	-87.83123	F-statistic	147.6433
Durbin-Watson stat	2.094472	Prob(F-statistic)	0.000000

Null Hypothesis: LNJRGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.147029	0.0266
Test critical values:	1% level	-3.503879	
	5% level	-2.893589	
	10% level	-2.583931	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRGDP)
Method: Least Squares
Date: 02/20/03 Time: 00:07
Sample(adjusted): 1980:2 2002:4
Included observations: 91 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNJRGDP(-1)	-0.013038	0.004143	-3.147029	0.0022
C	0.115468	0.034729	3.324798	0.0013

R-squared	0.100136	Mean dependent var	0.006200
Adjusted R-squared	0.090025	S.D. dependent var	0.007670
S.E. of regression	0.007316	Akaike info criterion	-6.975716
Sum squared resid	0.004764	Schwarz criterion	-6.920533
Log likelihood	319.3951	F-statistic	9.903790
Durbin-Watson stat	1.582960	Prob(F-statistic)	0.002244

Null Hypothesis: D(LNJRGDP) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.022068	0.0367
Test critical values:	1% level	-3.506484	
	5% level	-2.894716	
	10% level	-2.584529	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRGDP,2)
Method: Least Squares
Date: 02/20/03 Time: 00:08
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRGDP(-1))	-0.412889	0.136625	-3.022068	0.0033
D(LNJRGDP(-1),2)	-0.432302	0.131796	-3.280086	0.0015
D(LNJRGDP(-2),2)	-0.252981	0.105214	-2.404437	0.0184
C	0.002603	0.001139	2.284679	0.0249

R-squared	0.435389	Mean dependent var	-1.68E-05
Adjusted R-squared	0.415224	S.D. dependent var	0.009350
S.E. of regression	0.007150	Akaike info criterion	-6.998935
Sum squared resid	0.004295	Schwarz criterion	-6.886328
Log likelihood	311.9531	F-statistic	21.59166
Durbin-Watson stat	1.949847	Prob(F-statistic)	0.000000

Null Hypothesis: D(LNJRGDP,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.14365	0.0001
Test critical values:	1% level	-3.506484	
	5% level	-2.894716	
	10% level	-2.584529	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRGDP,3)
Method: Least Squares
Date: 02/20/03 Time: 00:09
Sample(adjusted): 1981:1 2002:4
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRGDP(-1),2)	-2.097801	0.172749	-12.14365	0.0000
D(LNJRGDP(-1),3)	0.389604	0.099448	3.917668	0.0002
C	4.40E-05	0.000798	0.055148	0.9561

R-squared	0.793096	Mean dependent var	-5.00E-05
Adjusted R-squared	0.788227	S.D. dependent var	0.016264
S.E. of regression	0.007485	Akaike info criterion	-6.918451
Sum squared resid	0.004762	Schwarz criterion	-6.833996
Log likelihood	307.4119	F-statistic	162.9088
Durbin-Watson stat	2.009464	Prob(F-statistic)	0.000000

Null Hypothesis: LNJRM1 has a unit root
Exogenous: Constant
Lag Length: 5 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.961766	1.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM1)
Method: Least Squares
Date: 02/20/03 Time: 00:09
Sample(adjusted): 1981:3 2002:4
Included observations: 86 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNJRM1(-1)	0.025619	0.008650	2.961766	0.0040
D(LNJRM1(-1))	0.303906	0.106141	2.863228	0.0054
D(LNJRM1(-2))	-0.211577	0.094448	-2.240132	0.0279
D(LNJRM1(-3))	-0.198238	0.109247	-1.814586	0.0734
D(LNJRM1(-4))	0.645459	0.104179	6.195670	0.0000
D(LNJRM1(-5))	-0.448941	0.122630	-3.660942	0.0005
C	-0.169117	0.059709	-2.832348	0.0059

R-squared	0.504879	Mean dependent var	0.016766
Adjusted R-squared	0.467275	S.D. dependent var	0.027181
S.E. of regression	0.019839	Akaike info criterion	-4.924460
Sum squared resid	0.031093	Schwarz criterion	-4.724688
Log likelihood	218.7518	F-statistic	13.42618
Durbin-Watson stat	2.000854	Prob(F-statistic)	0.000000

Null Hypothesis: D(LNJRM1) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.228063	0.1981
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM1,2)
Method: Least Squares
Date: 02/20/03 Time: 00:10
Sample(adjusted): 1981:3 2002:4
Included observations: 86 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRM1(-1))	-0.379525	0.170338	-2.228063	0.0287
D(LNJRM1(-1),2)	-0.221161	0.186327	-1.186949	0.2388
D(LNJRM1(-2),2)	-0.310540	0.171695	-1.808667	0.0743
D(LNJRM1(-3),2)	-0.396353	0.147879	-2.680255	0.0089
D(LNJRM1(-4),2)	0.368811	0.125284	2.943806	0.0042
C	0.007471	0.003368	2.218381	0.0294

R-squared	0.669146	Mean dependent var	-0.000319
Adjusted R-squared	0.648468	S.D. dependent var	0.035048
S.E. of regression	0.020780	Akaike info criterion	-4.842421
Sum squared resid	0.034545	Schwarz criterion	-4.671187
Log likelihood	214.2241	F-statistic	32.35974
Durbin-Watson stat	1.941316	Prob(F-statistic)	0.000000

Null Hypothesis: D(LNJRM1,2) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.111332	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM1,3)
Method: Least Squares
Date: 02/20/03 Time: 00:11
Sample(adjusted): 1981:3 2002:4
Included observations: 86 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRM1(-1),2)	-2.470058	0.404177	-6.111332	0.0000
D(LNJRM1(-1),3)	0.905468	0.315556	2.869432	0.0052
D(LNJRM1(-2),3)	0.307293	0.227285	1.352019	0.1801
D(LNJRM1(-3),3)	-0.279414	0.121555	-2.298668	0.0241
C	0.001956	0.002339	0.836284	0.4055

R-squared	0.877464	Mean dependent var	-0.000303
Adjusted R-squared	0.871413	S.D. dependent var	0.059351
S.E. of regression	0.021283	Akaike info criterion	-4.805472
Sum squared resid	0.036689	Schwarz criterion	-4.662778
Log likelihood	211.6353	F-statistic	145.0079
Durbin-Watson stat	1.919513	Prob(F-statistic)	0.000000

Null Hypothesis: LNJRM2 has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.973426	0.2980
Test critical values:	1% level	-3.507394	
	5% level	-2.895109	
	10% level	-2.584738	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM2)
Method: Least Squares
Date: 02/20/03 Time: 00:13
Sample(adjusted): 1981:2 2002:4
Included observations: 87 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNJRM2(-1)	-0.005733	0.002905	-1.973426	0.0519
D(LNJRM2(-1))	0.333063	0.103479	3.218647	0.0019
D(LNJRM2(-2))	0.155852	0.108941	1.430612	0.1564
D(LNJRM2(-3))	-0.138168	0.107078	-1.290350	0.2006
D(LNJRM2(-4))	0.334073	0.099693	3.351009	0.0012
C	0.052202	0.024978	2.089945	0.0398

R-squared	0.418264	Mean dependent var	0.011971
Adjusted R-squared	0.382355	S.D. dependent var	0.009495
S.E. of regression	0.007462	Akaike info criterion	-6.891557
Sum squared resid	0.004510	Schwarz criterion	-6.721494
Log likelihood	305.7827	F-statistic	11.64770
Durbin-Watson stat	1.899933	Prob(F-statistic)	0.000000

Null Hypothesis: D(LNJRM2) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.202365	0.2070
Test critical values:	1% level	-3.507394	
	5% level	-2.895109	
	10% level	-2.584738	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM2,2)
Method: Least Squares
Date: 02/20/03 Time: 00:14
Sample(adjusted): 1981:2 2002:4
Included observations: 87 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRM2(-1))	-0.245307	0.111383	-2.202365	0.0304
D(LNJRM2(-1),2)	-0.379766	0.121720	-3.119988	0.0025
D(LNJRM2(-2),2)	-0.206611	0.119568	-1.727976	0.0878
D(LNJRM2(-3),2)	-0.344640	0.101291	-3.402469	0.0010
C	0.003002	0.001549	1.938522	0.0560

R-squared	0.383656	Mean dependent var	-7.56E-05
Adjusted R-squared	0.353590	S.D. dependent var	0.009443
S.E. of regression	0.007592	Akaike info criterion	-6.867586
Sum squared resid	0.004727	Schwarz criterion	-6.725867
Log likelihood	303.7400	F-statistic	12.76063
Durbin-Watson stat	1.906960	Prob(F-statistic)	0.000000

Null Hypothesis: D(LNJRM2,2) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.851565	0.0000
Test critical values:	1% level	-3.507394	
	5% level	-2.895109	
	10% level	-2.584738	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNJRM2,3)
Method: Least Squares
Date: 02/20/03 Time: 00:15
Sample(adjusted): 1981:2 2002:4
Included observations: 87 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNJRM2(-1),2)	-2.280753	0.231512	-9.851565	0.0000
D(LNJRM2(-1),3)	0.736852	0.177592	4.149127	0.0001
D(LNJRM2(-2),3)	0.416716	0.098057	4.249740	0.0001
C	0.000102	0.000834	0.122602	0.9027

R-squared	0.775527	Mean dependent var	-0.000135
Adjusted R-squared	0.767414	S.D. dependent var	0.016104
S.E. of regression	0.007767	Akaike info criterion	-6.833107
Sum squared resid	0.005006	Schwarz criterion	-6.719732
Log likelihood	301.2401	F-statistic	95.58525
Durbin-Watson stat	1.948216	Prob(F-statistic)	0.000000