

Descriptive Statistical Analysis of Asian Countries

EViews - [Group: UNTITLED Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

Command Capture

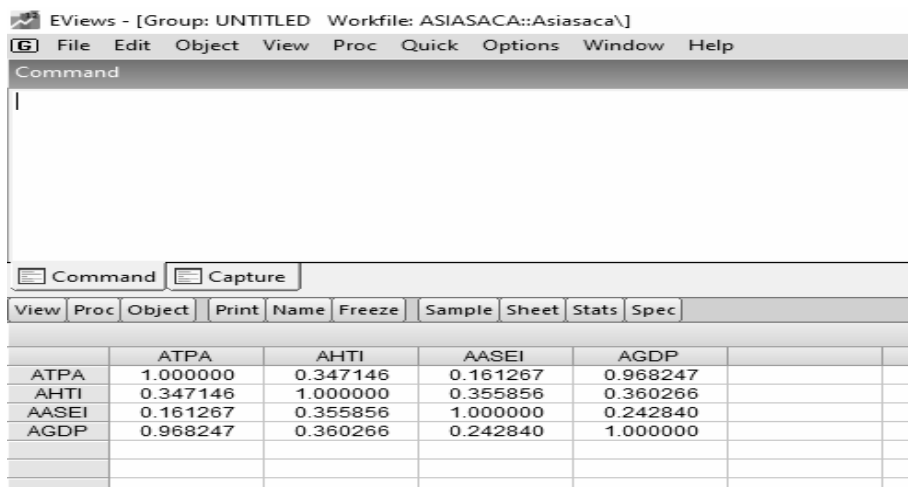
View	Proc	Object	Print	Name	Freeze	Sample	Sheet	Stats	Spec
				ATPA		AHTI		AASEI	AGDP
Mean				67891.42		0.100991		4.366696	1006.348
Median				1778.500		0.077000		4.330000	270.5600
Maximum				1381594.		0.281000		5.570000	12310.00
Minimum				30.00000		0.022000		2.800000	6.680000
Std. Dev.				240417.9		0.061269		0.661343	2371.684
Skewness				4.257491		1.152702		-0.098833	3.463937
Kurtosis				20.74342		3.314956		2.359046	14.56286
Jarque-Bera				1807.559		25.94250		2.155744	870.6224
Probability				0.000000		0.000002		0.340319	0.000000
Sum				7603839.		11.61400		502.1700	115730.0
Sum Sq. Dev.				6.42E+12		0.427945		49.86074	6.41E+08
Observations				112		115		115	115

Table 2.

Descriptive Statistical Analysis Summary of Asian Countries

Variable Name	Observations	Mean	Standard Deviation	Maximum	Minimum
ATPA	112	67891.42	240417.9	13815904	30.00
AHTI	115	0.100991	0.061269	0.281000	0.0220
AGDP	115	1006.348	2371.684	12310.00	6.6800
AASEI	115	4.3666	0.66134	5.570000	2.80000

Corelation Analysis of Asian Countries



	ATPA	AHTI	AASEI	AGDP
ATPA	1.000000	0.347146	0.161267	0.968247
AHTI	0.347146	1.000000	0.355856	0.360266
AASEI	0.161267	0.355856	1.000000	0.242840
AGDP	0.968247	0.360266	0.242840	1.000000

Table 3.

Corelation Analysis of Asian Countries

	ATPA	AHTI	AASEI	AGDP
ATPA	1.000000	0.347146	0.161267	0.968247
AHTI	0.347146	1.000000	0.355856	0.360266
AASEI	0.161267	0.355856	1.000000	0.242840
AGDP	0.968247	0.360266	0.242840	1.000000

URT at Level

EViews - [Series: ATPA Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: ATPA
 Date: 03/13/22 Time: 11:02
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu ^{t*}	14.3582	1.0000	23	88
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	42.8875	0.6034	23	88
PP - Fisher Chi-square	51.5689	0.2651	23	88

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: ATPA Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel Unit Root Test on D(ATPA)

Panel unit root test: Summary
 Series: D(ATPA)
 Date: 03/13/22 Time: 10:52
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu ^{t*}	0.55998	0.7123	21	63
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	83.0848	0.0002	21	63
PP - Fisher Chi-square	87.8250	0.0000	21	63

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: AHTI Workfile: ASIASACA::Asiasaca]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: AHTI
 Date: 03/13/22 Time: 11:04
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.05806	0.1450	23	92
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	46.2404	0.4623	23	92
PP - Fisher Chi-square	46.3504	0.4578	23	92

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: AHTI Workfile: ASIASACA::Asiasaca]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: D(AHTI)
 Date: 03/13/22 Time: 11:06
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.1117	0.0000	23	69
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	189.614	0.0000	23	69
PP - Fisher Chi-square	193.287	0.0000	23	69

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: AGDP Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: AGDP
 Date: 03/13/22 Time: 11:07
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	6.13915	1.0000	23	92
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	29.3211	0.9736	23	92
PP - Fisher Chi-square	39.1563	0.7523	23	92

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: AGDP Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: D(AGDP)
 Date: 03/13/22 Time: 11:09
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.77660	0.0001	23	69
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	67.5970	0.0207	23	69
PP - Fisher Chi-square	68.1692	0.0185	23	69

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: AASEI Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: AASEI
 Date: 03/13/22 Time: 11:10
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	3.40531	0.9997	23	92
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	27.7033	0.9850	23	92
PP - Fisher Chi-square	39.5785	0.7366	23	92

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: AASEI Workfile: ASIASACA::Asiasaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: D(AASEI)
 Date: 03/13/22 Time: 11:12
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on AIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.82862	0.0000	23	69
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	122.255	0.0000	23	69
PP - Fisher Chi-square	127.998	0.0000	23	69

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Table 4.

Unit Root Test Summary of Asian Countries

Variable Name	At Level / At 1 st Difference	Levin-Lin-Chu Statistic	Levin-Lin-Chu Probability**	ADF – Fisher Chi-square Statistic	ADF – Fisher Chi-square Probability**	PP – Fisher Chi-square Statistic	PP – Fisher Chi-square Probability**
ATPA	At Level	14.3582	1.0000	42.8875	0.6034	51.5689	0.2651
	At 1 st Difference	0.55998	0.7123	83.0848	0.0002**	87.8250	0.0000**
AHTI	At Level	-1.05806	0.1450	46.2404	0.4623	46.3504	0.4578
	At 1 st Difference	-22.1117	0.0000**	189.614	0.0000**	193.287	0.0000**
AGDP	At Level	6.13915	1.0000	29.3211	0.9736	39.1563	0.7523
	At 1 st Difference	-3.77660	0.0001**	67.5970	0.0207**	68.1692	0.0185**
AASEI	At Level	3.40531	0.9997	27.7033	0.9850	39.5785	0.7366
	At 1 st Difference	-9.82862	0.0000**	122.255	0.0000**	127.998	0.0000**

GMM Analysis of Asian Countries (Patent)

EViews - [Equation: UNTITLED Workfile: ASIAI::AsiaI\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Print Name Freeze Estimate Forecast Stats Resids

Dependent Variable: ATPA
Method: Panel Generalized Method of Moments
Transformation: First Differences
Date: 03/11/22 Time: 12:32
Sample (adjusted): 2015 2017
Periods included: 3
Cross-sections included: 23
Total panel (unbalanced) observations: 65
White period (period correlation) instrument weighting matrix
White period (cross-section cluster) standard errors & covariance (d.f. corrected)
Standard error and t-statistic probabilities adjusted for clustering
Instrument specification: @DYN(ATPA,-2) AASEI(-1) AHTI(-1)
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATPA(-1)	0.697181	0.001510	461.7242	0.0000
AASEI	151409.8	1306.261	115.9108	0.0000
AHTI	198734.2	50686.76	3.920830	0.0007

Effects Specification

Cross-section fixed (first differences)			
Mean dependent var	6986.646	S.D. dependent var	40746.30
S.E. of regression	42301.70	Sum squared resid	1.11E+11
J-statistic	7.156390	Instrument rank	8
Prob(J-statistic)	0.209267		

Table 5.

Dynamic GMM Estimation; Dependent Variable: ATPA of Asian Countries

Dependent Variable: ATPA (Total Patent Applications of Asian Countries)				
Method: Panel Generalized Method of Moments (P-GMM)				
Transformations: First Differences				
Variable	Coefficient	Standard Error	t-Statistics	Probability
ATPA (-1)	0.697181	0.001510	461.7242	0.0000**
AASEI	151409.8	1306.261	115.9108	0.0000**
AHTI	198734.2	50686.76	3.920830	0.0007**
Effects Specifications				
Cross-Section Fixed (First Differences)				
Mean Dependent Variable	6986.646			
S E of Regression	42301.70			
J-Statistics	7.156390			
Probability (J-Statistic)	0.209267			
S D Dependent Variable	40746.30			
Instrument Rank	8			

GMM Analysis of Asian Countries (gdp)

EViews - [Equation: UNTITLED Workfile: AEG::Aeg\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Print Name Freeze Estimate Forecast Stats Resids

Dependent Variable: AGDP
Method: Panel Generalized Method of Moments
Transformation: First Differences
Date: 03/11/22 Time: 12:45
Sample (adjusted): 2015 2017
Periods included: 3
Cross-sections included: 23
Total panel (unbalanced) observations: 65
White period (period correlation) instrument weighting matrix
White period (cross-section cluster) standard errors & covariance (d.f. corrected)
Standard error and t-statistic probabilities adjusted for clustering
Instrument specification: @DYN(AGDP,-2) ATPA(-1)
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGDP(-1)	-0.168705	0.015777	-10.69312	0.0000
ATPA	0.003738	5.73E-05	65.20635	0.0000

Effects Specification

Cross-section fixed (first differences)			
Mean dependent var	38.72985	S.D. dependent var	183.1001
S.E. of regression	157.1758	Sum squared resid	1556367.
J-statistic	6.470626	Instrument rank	7
Prob(J-statistic)	0.263078		

Table 6.

Dynamic GMM Estimation; Dependent Variable: AGDP of Asian Countries

Dependent Variable: AGDP (Gross Domestic Product of Asian Countries)				
Method: Panel Generalized Method of Moments (P-GMM)				
Transformations: First Differences				
Variable	Coefficient	Standard Error	t-Statistics	Probability
AGDP (-1)	-0.168705	0.015777	-10.69312	0.0000**
ATPA	0.003738	5.73E-05	65.20635	0.0000**
Effects Specifications				
Cross-Section Fixed (First Differences)				
Mean Dependent Variable	38.78985			
S E of Regression	157.1758			
J-Statistics	6.470626			
Probability (J-Statistic)	0.263078			
S D Dependent Variable	183.1001			
Instrument Rank	7			

Descriptive Statistical Analysis of European Countries

View	Proc	Object	Print	Name	Freeze	Sample	Sheet	Stats	Spec
				EHTI		EASEI		ETPA	EGDP
Mean				0.089504		4.421786		4043.800	466.0643
Median				0.082000		4.450000		849.5000	203.1250
Maximum				0.193000		6.300000		67900.00	3880.000
Minimum				0.025000		2.870000		30.00000	7.750000
Std. Dev.				0.032916		0.661266		12371.91	801.6524
Skewness				0.916138		0.229256		4.573330	2.926977
Kurtosis				3.516183		3.187268		22.99651	10.96052
Jarque-Bera				20.98714		1.430926		2820.544	569.5586
Probability				0.000028		0.488966		0.000000	0.000000
Sum				12.44100		619.0500		566132.0	65249.00
Sum Sq. Dev.				0.149515		60.78085		2.13E+10	89327879
Observations				139		140		140	140

Table 7.

Descriptive Statistical Analysis Summary of European Countries

Variable Name	Observations	Mean	Standard Deviation	Maximum	Minimum
ETPA	140	4043.800	12371.91	67900.00	30.00000
EHTI	139	0.089504	0.032916	0.193000	0.025000
EGDP	140	466.0643	801.6524	3880.000	7.750000
EASEI	140	4.421786	0.661266	6.300000	2.870000

Corelation Analysis of European Countries

EViews - [Group: UNTITLED Workfile: EUROPSACA::Europsaca\]
 File Edit Object View Proc Quick Options Window Help
 Command
 |
 Command Capture
 View Proc Object Print Name Freeze Sample Sheet Stats Spec

	EHTI	EASEI	ETPA	EGDP
EHTI	1.000000	-0.120325	0.160831	0.201591
EASEI	-0.120325	1.000000	0.221289	0.336461
ETPA	0.160831	0.221289	1.000000	0.881338
EGDP	0.201591	0.336461	0.881338	1.000000

Table 8.

Corelation Analysis of European Countries

	EHTI	EASEI	ETPA	EGDP
EHTI	1.000000	-0.120325	0.160831	0.201591
EASEI	-0.120325	1.000000	0.221289	0.336461
ETPA	0.160831	0.221289	1.000000	0.881338
EGDP	0.201591	0.336461	0.881338	1.000000

URT at Level

EViews - [Series: ETPA Workfile: EUROPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ider

Panel unit root test: Summary
 Series: ETPA
 Date: 03/13/22 Time: 11:27
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.65356	0.0000	28	112
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	93.5950	0.0012	28	112
PP - Fisher Chi-square	110.828	0.0000	28	112

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: ETPA Workfile: EUROPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ider

Panel unit root test: Summary
 Series: D(ETPA)
 Date: 03/13/22 Time: 11:28
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.90939	0.0000	28	84
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	159.443	0.0000	28	84
PP - Fisher Chi-square	160.916	0.0000	28	84

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: EHTI Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ide

Panel unit root test: Summary
 Series: EHTI
 Date: 03/13/22 Time: 11:41
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-0.45138	0.3259	28	110
<u>Null: Unit root (assumes individual unit root process)</u>				
ADF - Fisher Chi-square	74.9340	0.0464	28	110
PP - Fisher Chi-square	77.4125	0.0306	28	110

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: EHTI Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: D(EHTI)
 Date: 03/13/22 Time: 11:43
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-27.8340	0.0000	27	81
<u>Null: Unit root (assumes individual unit root process)</u>				
ADF - Fisher Chi-square	239.042	0.0000	27	81
PP - Fisher Chi-square	248.717	0.0000	27	81

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: EGDG Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Sta

Panel unit root test: Summary
 Series: EGDG
 Date: 03/13/22 Time: 11:47
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.41991	0.6627	28	112
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	38.4742	0.9644	28	112
PP - Fisher Chi-square	41.4977	0.9259	28	112

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: EGDG Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Id

Panel unit root test: Summary
 Series: D(EGDP)
 Date: 03/13/22 Time: 11:49
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.68981	0.0000	28	84
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	119.951	0.0000	28	84
PP - Fisher Chi-square	119.288	0.0000	28	84

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at Level

EViews - [Series: EASEI Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Id

Panel unit root test: Summary
 Series: EASEI
 Date: 03/13/22 Time: 11:50
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.24560	0.0006	28	112
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	73.5629	0.0578	28	112
PP - Fisher Chi-square	89.0556	0.0033	28	112

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

URT at first Difference

EViews - [Series: EASEI Workfile: EUOPSACA::Europsaca\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats Ident

Panel unit root test: Summary
 Series: D(EASEI)
 Date: 03/13/22 Time: 11:52
 Sample: 2013 2017
 Exogenous variables: None
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.18306	0.0000	28	84
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	116.933	0.0000	28	84
PP - Fisher Chi-square	117.815	0.0000	28	84

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Table 9.

Unit Root Test Summary of European Countries

Variable Name	At Level / At 1 st Difference	Levin-Lin-Chu Statistic	Levin-Lin-Chu Probability**	ADF – Fisher Chisquare Statistic	ADF – Fisher Chisquare Probability**	PP – Fisher Chisquare Statistic	PP – Fisher Chisquare Probability**
ETPA	At Level	-4.65356	0.0000**	93.5950	0.0012**	110.828	0.0000**
	At 1 st Difference	-7.90939	0.0000**	159.443	0.0000**	160.916	0.0000**
EHTI	At Level	-0.45138	0.3259	74.9340	0.0464**	77.4125	0.0306**
	At 1 st Difference	-27.8340	0.0000**	239.042	0.0000**	248.717	0.0000**
EGDP	At Level	0.41991	0.6627	38.4742	0.9644	41.4977	0.9259
	At 1 st Difference	-8.68981	0.0000**	119.951	0.0000**	119.288	0.0000**
EASEI	At Level	-3.24560	0.0006**	73.5629	0.0578	89.0556	0.0033**
	At 1 st Difference	-8.18306	0.0000**	116.933	0.0000**	117.815	0.0000**

GMM Analysis of European Countries (Patent)

EViews - [Equation: UNTITLED Workfile: EUROPI::Europi\]

File Edit Object View Proc Quick Options Window Help

Command

View Proc Object Print Name Freeze Estimate Forecast Stats Resids

Dependent Variable: ETPA
Method: Panel Generalized Method of Moments
Transformation: First Differences
Date: 03/11/22 Time: 12:41
Sample (adjusted): 2015 2017
Periods included: 3
Cross-sections included: 28
Total panel (unbalanced) observations: 82
White period (period correlation) instrument weighting matrix
White period (cross-section cluster) standard errors & covariance (d.f. corrected)
Standard error and t-statistic probabilities adjusted for clustering
Instrument specification: @DYN(ETPA,-2) EASEI(-1) EHTI(-1)
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETPA(-1)	0.441222	0.075656	5.831920	0.0000
EASEI	637.2821	521.4790	1.222067	0.2322
EHTI	-3938.279	11792.58	-0.333962	0.7410

Effects Specification

Cross-section fixed (first differences)			
Mean dependent var	-0.036585	S.D. dependent var	290.0703
S.E. of regression	280.8517	Sum squared resid	6231337.
J-statistic	5.720680	Instrument rank	8
Prob(J-statistic)	0.334353		

Table 10.

Dynamic GMM Estimation. Dependent Variable: ETPA of European Countries

Dependent Variable: ETPA (Total Patent Applications of European Countries)				
Method: Panel Generalized Method of Moments (P-GMM)				
Transformations: First Differences				
Variable	Coefficient	Standard Error	t-Statistics	Probability
ETPA (-1)	0.441222	0.075656	5.831920	0.0000**
EASEI	637.2821	521.4790	1.222067	0.2322
EHTI	-3938.279	11792.58	-0.333962	0.7410
Effects Specifications				
Cross-Section Fixed (First Differences)				
Mean Dependent Variable	-0.036585			
S E of Regression	280.8517			
J-Statistics	5.720680			
Probability (J-Statistic)	0.334353			
S D Dependent Variable	290.0703			
Instrument Rank	8			

GMM Analysis of European Countries (gdp)

EViews - [Equation: UNTITLED Workfile: EGDp::Egdp\]

File Edit Object View Proc Quick Options Window Help

Command

View	Proc	Object	Print	Name	Freeze	Estimate	Forecast	Stats	Resids
Dependent Variable: EGDp Method: Panel Generalized Method of Moments Transformation: First Differences Date: 03/11/22 Time: 12:56 Sample (adjusted): 2015 2017 Periods included: 3 Cross-sections included: 28 Total panel (balanced) observations: 84 White period (period correlation) instrument weighting matrix White period (cross-section cluster) standard errors & covariance (d.f. corrected) Standard error and t-statistic probabilities adjusted for clustering Instrument specification: @DYN(EGDP,-2) ETPA(-1) Constant added to instrument list									
Variable	Coefficient	Std. Error	t-Statistic	Prob.					
EGDP(-1)	-0.130005	0.071126	-1.827815	0.0786					
ETPA	-0.216601	0.025724	-8.420047	0.0000					
Effects Specification									
Cross-section fixed (first differences)									
Mean dependent var	-9.343571	S.D. dependent var	84.28979						
S.E. of regression	74.40004	Sum squared resid	453900.0						
J-statistic	3.803141	Instrument rank	7						
Prob(J-statistic)	0.578093								

Table 11.

Results of Dynamic GMM Estimation. Dependent Variable: EGDP of European Countries

Dependent Variable: EGDP (Gross Domestic Product of European Countries)				
Method: Panel Generalized Method of Moments (P-GMM)				
Transformations: First Differences				
Variable	Coefficient	Standard Error	t-Statistics	Probability
EGDP (-1)	-0.13005	0.071126	-1.827815	0.0786 ^{***}
ETPA	-0.216601	0.025724	-0.420047	0.0000 ^{**}
Effects Specifications				
Cross-Section Fixed (First Differences)				
Mean Dependent Variable	-9.343571			
S E of Regression	74.40004			
J-Statistics	3.803141			
Probability (J-Statistic)	0.578093			
S D Dependent Variable	84.289709			
Instrument Rank	7			