**مثال تطبيقي حول استقرارية بعض المتغيرات الاقتصادية**

**1-استقرارية السلاسل الأصلية**

**أولا: التمثيل البياني لدوال الارتباط الذاتي والجزئي**

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**ثانيا: اختبار ديكي فولر المطور**

**سلسلة متغير البطالة ch**

**النموذج3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: CH has a unit root | | | |  |
| Exogenous: Constant, Linear Trend | | | |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -2.385866 | 0.3783 |
| Test critical values: | 1% level |  | -4.323979 |  |
|  | 5% level |  | -3.580623 |  |
|  | 10% level |  | -3.225334 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(CH) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 10:27 | | |  |  |
| Sample (adjusted): 1991 2018 | | |  |  |
| Included observations: 28 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| CH(-1) | -0.214020 | 0.089703 | -2.385866 | 0.0249 |
| C | 6.971928 | 2.842589 | 2.452669 | 0.0215 |
| @TREND("1990") | -0.224871 | 0.086158 | -2.609987 | 0.0151 |
|  |  |  |  |  |

**سلسلة متغير النمو القتصادي GDP**

**النموذج 3**

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| --- | --- | --- | --- | --- |
| Null Hypothesis: GDP has a unit root | | | |  |
| Exogenous : Constant, Linear Trend | | | |  |
| Lag Length: 0 (Automatic – based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -3.164058 | 0.1119 |
| Test critical values : | 1% level |  | -4.323979 |  |
|  | 5% level |  | -3.580623 |  |
|  | 10% level |  | -3.225334 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable : D(GDP) | | |  |  |
| Method : Least Squares | | |  |  |
| Date : 06/09/22 Time : 12 :00 | | |  |  |
| Sample (adjusted) : 1991 2018 | | |  |  |
| Included observations : 28 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| GDP(-1) | -0.600783 | 0.189878 | -3.164058 | 0.0041 |
| C | 1.387598 | 0.813461 | 1.705796 | 0.1004 |
| @TREND(« 1990 ») | 0.022388 | 0.048296 | 0.463547 | 0.6470 |
|  |  |  |  |  |

النموذج 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: GDP has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -3.243200 | 0.0279 |
| Test critical values: | 1% level |  | -3.689194 |  |
|  | 5% level |  | -2.971853 |  |
|  | 10% level |  | -2.625121 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(GDP) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 13:36 | | |  |  |
| Sample (adjusted): 1991 2018 | | |  |  |
| Included observations: 28 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| GDP(-1) | -0.571227 | 0.176131 | -3.243200 | 0.0032 |
| C | 1.628511 | 0.616269 | 2.642534 | 0.0138 |
|  |  |  |  |  |

**سلسلة متغير االتضخم INF**

النموذج 3

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| --- | --- | --- | --- | --- |
| Null Hypothesis: INF has a unit root | | | |  |
| Exogenous: Constant, Linear Trend | | | |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -1.825803 | 0.6650 |
| Test critical values: | 1% level |  | -4.323979 |  |
|  | 5% level |  | -3.580623 |  |
|  | 10% level |  | -3.225334 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(INF) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 12:04 | | |  |  |
| Sample (adjusted): 1991 2018 | | |  |  |
| Included observations: 28 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| INF(-1) | -0.244160 | 0.133728 | -1.825803 | 0.0798 |
| C | 4.207949 | 3.353250 | 1.254887 | 0.2211 |
| @TREND("1990") | -0.165523 | 0.156380 | -1.058466 | 0.3000 |
|  |  |  |  |  |

**نموذج 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: INF has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -1.496436 | 0.5207 |
| Test critical values: | 1% level |  | -3.689194 |  |
|  | 5% level |  | -2.971853 |  |
|  | 10% level |  | -2.625121 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(INF) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 13:43 | | |  |  |
| Sample (adjusted): 1991 2018 | | |  |  |
| Included observations: 28 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| INF(-1) | -0.150959 | 0.100879 | -1.496436 | 0.1466 |
| C | 0.948950 | 1.331281 | 0.712809 | 0.4823 |
|  |  |  |  |  |

النموذج 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: INF has a unit root | | | |  |
| Exogenous: None | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -1.408092 | 0.1447 |
| Test critical values: | 1% level |  | -2.650145 |  |
|  | 5% level |  | -1.953381 |  |
|  | 10% level |  | -1.609798 |  |
|  |  |  |  |  |

**استقرارية السلاسل بعد الفرق الاول**

**أولا: التمثيل البياني لدوال الارتباط الذاتي والجزئي**

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**ثانيا: اختبار ديكي فولر المطور**

**سلسلة متغير البطالة عند الفرق الأول DCH**

**النموذج 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: DCH has a unit root | | | |  |
| Exogenous: Constant, Linear Trend | | | |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -3.647957 | 0.0442 |
| Test critical values: | 1% level |  | -4.339330 |  |
|  | 5% level |  | -3.587527 |  |
|  | 10% level |  | -3.229230 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(DCH) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 14:07 | | |  |  |
| Sample (adjusted): 1992 2018 | | |  |  |
| Included observations: 27 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| DCH(-1) | -0.718687 | 0.197011 | -3.647957 | 0.0013 |
| C | 0.228886 | 0.955736 | 0.239486 | 0.8128 |
| @TREND("1990") | -0.033826 | 0.057535 | -0.587924 | 0.5621 |
|  |  |  |  |  |

النموذج 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: DCH has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -3.656347 | 0.0111 |
| Test critical values: | 1% level |  | -3.699871 |  |
|  | 5% level |  | -2.976263 |  |
|  | 10% level |  | -2.627420 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(DCH) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 06/09/22 Time: 14:09 | | |  |  |
| Sample (adjusted): 1992 2018 | | |  |  |
| Included observations: 27 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| DCH(-1) | -0.692632 | 0.189433 | -3.656347 | 0.0012 |
| C | -0.269378 | 0.435971 | -0.617881 | 0.5422 |
|  |  |  |  |  |
|  |  |  |  |  |

**النموذج 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: DCH has a unit root | | | |  |
| Exogenous: None | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=6) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -3.647928 | 0.0007 |
| Test critical values: | 1% level |  | -2.653401 |  |
|  | 5% level |  | -1.953858 |  |
|  | 10% level |  | -1.609571 |  |
|  |  |  |  |  |