

Sustainability Of Current Accounts In Arabic Countries ; Evidence From Panel Cointegration.

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Abstract :

The objective of this paper is to investigate the sustainability of current account imbalances by using the data of twenty one Arabic countries over the 2000-2013 periods. Sustainability of current account for Arabic countries is analyzed under intertemporal borrowing constraint (IBC) (Husted 1992) approach by performing an empirical analysis of Pedroni (1999) and Kao (1999) panel cointegration between exports and imports plus net transfer payments plus net interest payments ; The empirical results of panel cointegration test show that these variables are cointegrated for whole period. To find regression coefficient we use panel OLS ; FMOLS and DOLS estimators. It is found that the coefficient is not significantly equal to one but very close to one in FMOLS regression but is significantly equal to one in DOLS regression. The overall results provide evidence in favour of the sustainability of the current account for all the Arabic countries as a group.

Keywords : current accounts, exports, imports, IBC, panel.

1. Introduction :

The concept of current account sustainability has long been the focus of research and policy debate in economics. Since the beginning of the 1990s, current account (CA) imbalances have been widening considerably in the world economy, one important aspect of intertemporal plans is the time path of the current accounts, which measures changes in national net indebtedness. The basic idea is appealing as it amounts to analyzing whether a country is able to meet its inter-temporal budget constraint in the long-run without incurring episodes of fast and painful adjustment.

Long periods of current account deficits may end either abruptly by generating debt and exchange rate crises and output collapse or by achieving a soft landing that will inevitably imply investment, consumption and growth slowdowns.

The issue of stationary current accounts is important for two reasons (Obstfeld and Rogoff, 1996, p. 90) :

- ✓ First : a stationary current account is consistent with the sustainability of external debts which indicates that there is no incentive for a country to default on its international debts.
- ✓ Second : the stationarity of current accounts agrees with the implication of the modern intertemporal model of the current account, and hence supports its validity.

Intuitively, studies on the dynamic properties of the current account imply that, if stationarity is not observed, then the country's current account is not mean-reverting. If this behavior is perpetuated in the future the country will end up in bankruptcy and will be cut off from international capital markets unless an unexpected shock brings it back into equilibrium.

Therefore, the mean reversion property of the current account has at least two important implications for international macroeconomics (Wu, 2000):

- First, a stationary current account is consistent with the sustainability of the external debt. In this case, there is no incentive for the government to make drastic policy changes and default on its international debts in the near future.
- Second, the stationarity of the current account validates the modern intertemporal model.

The concept of current account sustainability is linked to the stationarity of the current account balance, as non-stationary dynamics would imply a violation of the inter-temporal budget constraint. Testing for the presence of unit roots and cointegration in the current account dynamics of developed and emerging markets has been the focus of many papers such as Trehan and Walsh (1991), Otto (1992), Wickens and Uctum (1993), Ghosh 1995, Liu and Tanner (1996), Wu et al., 1996, Fountas and Wu 1999, Taylor (2002) Matsubayashi (2005),; Ghosh 1995; Apergis et al., 2000; Bergin and Sheffrin, 2000; Liu and Tanner, 2001; Arize, 2002; Baharumshah et al., 2003; Dulger and Ozdemir, 2005; Ismail and Baharumshah, 2008). Wu (2000), Wu et al. (2001), Lau and Baharumshah (2005), Lau et al. (2006), Kalyoncu (2006), Holmes (2006) and Chu et al. (2007).

As Fountas and Wu (1999) stated that short-run current account deficits may not be considered bad, as they may reflect reallocation of capital to the country where capital is more productive.

However persistent payment imbalances can have two serious effect :

- ✓ One of them is that they might increase interest rates to attract foreign capital to sustain an increasing current account deficit.
- ✓ Other effect is that these measures impose an excessive burden on future generations as the accumulation of larger debt will imply increasing interest payments and thus lower future standards of living.

In the empirical literature on current account sustainability there have been basically two main approaches. Both approaches suggest possible techniques to test the sustainability of a current account under intertemporal borrowing constraint (IBC) approach :

- ✓ The first approach is based on the univariate time series properties of the current account;
- ✓ the second approach is based on the long-run relationship between exports and imports (bivariate approach) as Husted (1992) tried to examine cointegration regressions between US exports and imports over the period of 1967 Q(1)–

1989 Q(4). He pointed out that up to the end of 1983, US exports and imports were cointegrated and that external deficits were sustainable

The question of sustainability of current account has been studied in recent years by a large literature. Unit root and cointegration tests have provided useful tools in gaining insight into the long-run implications of current account. Husted 1992, Wickens and Uctum 1993, Ahmed and Rogers 1995, Milesi-Ferretti and Razin 1996, Wu et al. 1996, Cashin and McDermott 1998, Fountas and Wu 1999, Ho-Don Yan 1999, Apergis *et al.* 2000, Wu 2000, Wu et al. 2001, Baharumshah et al. 2003, Onel and Utkulu 2006, Kalyoncu 2005,2006 are examples of these large literature.

An empirical investigation about the sustainability of current account deficits provides mixed results in the relevant literature. Some studies such as Husted 1993 and Gould and Ruffin 1996 using US data; Bahmani-Oskooee 1994 using Australian data; Herzer and Nowak-Lehmann 2005 using Chilean data; Cheong 2005 using Malaysian data; Kalyoncu 2005 using Turkish data; Hollauer and Mendonca 2006 using Brazilian data; Bineau 2007 using Bulgarian data; and Ramona and Razvan 2009 using Romanian data found that exports and imports of these countries in their period of study converge in the long run. Moreover, Wu et al. 2001 using a panel cointegration tests, support the sustainability of current account for G7 countries.

On the other hand, Founds and Wu 1999 using US data; Cheong 2005 using Malaysian data; and Verma and Perera 2008 using Sri Lanka's data, have shown that the hypothesis of no long-run relationship between imports and exports cannot be rejected and conclude that the trade deficits of those countries are not sustainable.

Baharamuhah et al. 2003 investigate the sustainability of current account deficits for four ASEAN countries namely Indonesia, Malaysia, the Philippines, and Thailand for 1961–1991 period, and their results show that, except Malaysia, these countries were not in a long-run steady state in that period except Malaysia.

Moreover, Erbaykal and Karaca 2008 examine the foreign deficit of Turkey and conclude that although exports and imports of Turkey are cointegrated, the slope coefficient of their regression is not statistically equal to one.

In this study we investigate sustainability of current account imbalances by using the data covering 2000/2013 period of all arabic countries except palestine.

2. Theoretical background and econometric methodology :

Following Hakkio and Rush 1991, Husted 1992 provides a simple framework that implies a long-run relationship between exports and imports, He models the behavior of the stock of external debt to determine where a country's intertemporal budget constraint is verified. The individual current-period budget constraint at time t is:

The individual current-period budget constraint is:

$$C_0 = Y_0 + B_0 - I_0 - (1+r)B_{-1} \dots \dots \dots (1)$$

where C_0 , I_0 , Y_0 , B_0 and r are current consumption, investment, output, international borrowing which could be positive or negative, and a one-period interest rate, respectively. $(1+r)B$ is the initial debt size.

After making several assumptions, Husted 1992 derives a testable model

$$X_t = a + bM_t + e_t \dots \dots \dots (2)$$

where X is the exports of goods and services, and M is the imports of goods and services plus net interest payments and net transfer payments. For a sustainable current account deficit, b should be equal to one and e_t should be stationary. This means that exports are cointegrated with imports and t the cointegrating coefficient, b , is one.

The empirical results may allow establishing several conclusions related to the sustainability of the current account:

- ✓ if there is no co-integration the current account is not sustainable;
- ✓ if there is co-integration with $\beta = 1$, the current account is sustainable,
- ✓ if there is co-integration, with $\beta < 1$, economies exports growing lower than economy's imports, and the current account may not be sustainable.

There are a number of cointegration tests, such as Engle and Granger (1987), Johansen (1991) and Philips and Ouliaris (1990), which are documented in the time series literature. However, these tests fail to take advantage of information across countries, which leads to loss of efficiency in estimation. Recently, several authors, Pedroni (1999) and Kao and Chiang (1998) recently provided a series of tests of cointegration in panels that can be viewed as extensions of these single equation tests. This paper applies the methods of Kao and Chiang (1998) to investigate the cointegration between exports and imports since their method allows us to examine the significance of cointegration coefficients. Based on the panel cointegration.

Therefore, before employing panel co-integration techniques, it is essential to verify that all variables are integrated of order one in levels. In recent years some tests for unit root within panels are developed in the literature. Levin and Lin (1992, 1993), Im, Pesaran and Shin (1997), Maddala and Wu (1999), Kao (1999) and Quah (1994) have developed panel unit root tests. In this study Im, Pesaran and Shin (hereafter IPS) tests are used. The IPS test is more important because it is appropriate for a heterogeneous regressive root under an alternative hypothesis.

Consider the following fixed-effect panel regression:

$$X_{it} = \alpha_i + \beta M_{it} + e_i, i=1, \dots, N; t=1, \dots, T \dots \dots \dots (3)$$

where $M_{it} = M_{it-1} + u_{it}$; (X_{it}, M_{it}) are independent across cross-sectional units and $e_i (u_{it}, e_{it})$ is a linear process that satisfies the assumption in Kao and Chiang (1998), Kao and Chiang (1998) derive limiting distributions for the ordinary least square (OLS), fully modified (FMOLS) and dynamic ordinary least square (DOLS) estimators in a cointegrated regression and then show that they are asymptotically normal.

3. Empirical results :

Unit root tests :

In the first step, IPS panel unit root tests are applied. The results of panel unit root tests are presented in Table 2 and reported intercept and intercept with a trend both in levels and in first differences. It can be inferred from the Table 1 that the unit root hypothesis cannot be rejected when the variables are taken in levels. However, when the first differences are used, the hypothesis of unit root non-stationary is rejected. These results enable to test the cointegration among variables in I(1) level.

Table 2 : Unit root tests

| | | Levels | | | | | first differences | | | | |
|---|--------|------------------|-----------------|----------------|----------------|----------------|-------------------|---------------|-----------------|-------------------|------------------|
| | | LLC | B t-stat | IPS w-stat | ADF | PP | LLC | B t-stat | IPS w-stat | ADF | PP |
| X | 1 P | -3.17 0.0008* | / | 2.022 0.97 | 25.51 0.97 | 40.13 0.553 | -9.40 0.000* | / | -6.29 0.000* | 119.44 0.0000* | 117.65 0.000* |
| | 2 P | -17.23 0.000* | -1.80 0.035* | -1.18 0.11 | 50.51 0.172 | 45.91 0.313 | -27.95 0.000* | 0.59 0.72 | -4.09 0.000* | 83.59 0.000* | 135.01 0.000* |
| | 3 P | 8.18 1.00 | / | / | 7.11 1.00 | 6.80 1.00 | +6.98 0.000* | / | / | 125.23 0.000* | 133.17 0.000* |
| M | 1 P | -4.88 0.000* | / | 1.58 0.943 | 26.70 0.968 | 39.68 0.573 | -12.68 0.000* | / | -5.53 0.000* | 106.9 0.000* | 105.2 0.000* |
| | 2 P | -4.48 0.000* | -1.43 0.07 | 0.435 0.668 | 37.26 0.678 | 27.30 0.961 | -12.10 0.000* | 1.380 0.91 | -1.17 0.119 | 69.92 0.024* | 107.47 0.000* |
| | 3 P | 11.53 1.00 | / | / | 5.76 1.00 | 5.611 1.00 | -7.85 0.000* | / | / | 122.63 0.000* | 122.31 0.000* |

* indicate the rejection of the unit-root null at 5%.

Cointegration :

The drawback of the previously mentioned (Johansen 1991, Engle and Granger 1987) cointegration tests is their failure to consider information across countries. Recently developed techniques allow us to deal with nonstationary data in a heterogeneous panel, which yields substantial benefits by exploiting data from a cross-section. With panel data, we are able to examine the cointegration between exports and imports, and to estimate its cointegrating coefficients with a surprising degree of precision. We therefore apply the panel cointegration method of Pedroni 1999, Kao and Chiang 1998 to investigate the cointegration between exports and imports and hence the sustainability of current accounts.

Table 3 : Panel cointegration tests

| | T | Prob | T | prob |
|--------------------------|------------------|-----------------|------------------|---------------|
| Panel v-Statistic | 3.870740 | 0.0001** | -1.965180 | 0.9753 |
| Panel rho- | -1.929205 | 0.0269** | 0.597517 | 0.7249 |
| Panel PP- | -1.881778 | 0.0299** | -0.160745 | 0.4361 |
| Panel ADF- | -2.814073 | 0.0024** | -1.084109 | 0.1392 |
| Group rho- | 1.660834 | 0.9516 | | |
| Group PP- | -1.799569 | 0.0360** | | |
| Group ADF- | -2.858763 | 0.0021** | | |

* indicate the rejection of the no cointegration null at 5%.

Results from Table 3 indicate that the null of no cointegration is rejected by six statistics from eleven. Given the fact that exports and imports are cointegrated, we then estimate equation (3) by using the method of OLS, FMOLS and DOLS. Furthermore, we test whether the cointegration coefficient, b , is significantly different from 0 and insignificantly different from 1.

Table 4 : Estimation results from the panel regression

| | OLS | DOLS | FMOLS |
|----------------------------|----------------|----------------|----------------|
| B | -1.12 | 1.0037 | 1.0057 |
| Prob | 0.000** | 0.000** | 0.000** |
| H₀ : b=0 | 665.46 | 292.9 | 1365.58 |
| H₁ : b=1 | 5.96 | 1.088** | 7.84 |
| R² | 0.97 | 0.89 | 0.89 |

Findings from Table 4, The estimates of β from FM and DOLS are very close to 1. The hypothesis of $\beta = 0$ and $\beta = 1$ are both rejected for the estimate from OLS and FMOLS. However, for those estimates from DOLS, the hypothesis of $\beta = 0$ is significantly rejected, but the hypothesis of $\beta = 1$ is not significantly rejected. Kao and Chiang (1998) point out that the OLS estimator has a non-negligible bias in finite samples and that the DOLS estimator may be more promising than OLS or FM estimators in estimating panel regressions. Therefore, we conclude that exports and imports are cointegrated with the cointegrating coefficient being 1, which implies that current accounts are sustainable and that none of the countries Arabic region tends to default on its international debt.

4. Conclusion :

In this paper we investigate the sustainability of current accounts by using a panel cointegration approach. We find that exports and imports are cointegrated and the cointegrating coefficient is not significantly different from 1. This finding supports the sustainability of external debts among major industrial countries. It is also consistent with that of Wu (2000) who supports the stationarity of current accounts by using a panel unit-root test.

References :

- Arize, A. (2002). Imports and exports in 50 countries: Tests of cointegration and structural breaks. *International Review of Economics and Finance* 11(1): 101– 115. <http://ideas.repec.org/a/eee/reveco/v11y2002i1p101-115.html>
- Bahmani-Oskooee, M. (1994). Are imports and exports of Australia cointegrated? *Journal of Economic Integration* 9(4).
- Bahramushah, A., Lau, E., and Fauntas, S. (2003). On the sustainability of current account deficits: Evidence from four ASEAN countries. *Journal of Asian Economics* 14(3). <http://ideas.repec.org/a/eee/asipeco/v14y2003i3p465-487.html>
- Cheong, T. (2005). Are Malaysian exports and imports cointegrated? A comment. *Sunway Academic Journal* 2.
- Christopoulos, D., and Leon-Ledesma, M. (2010). Current account sustainability in the US: What did we really know about it? *Journal of International Money and Finance* 29(3). <http://ideas.repec.org/a/eee/jimfin/v29y2010i3p442-459.html>
- Erbaykal E, and Karaca, O. (2008). Is Turkey's foreign deficit sustainable? Cointegration relationship between exports and imports. *International Research Journal of Finance and Economics* 14(3).
- Fountas, S., and Wu, J. L. (1999). Are the US current account deficits very sustainable? *International Economic Journal* 13(3). <http://www.tandfonline.com/doi/abs/10.1080/10168739900000004>
- Gould, D. M., and Ruffin, R. J. (1996). Trade deficits: Causes and consequences. *Federal Reserve Bank of Dallas Economic Review* 10–20 (fourth quarter). <http://ideas.repec.org/a/fip/fedder/y1996iqivp10-20.html>
- Hakkio, C., and Rush, M. (1991). Is the budget deficit too large? *Economic Inquiry* 29(3). <http://ideas.repec.org/a/oup/ecinqu/v29y1991i3p429-45.html>

- Herzer, D., and Nowak–Lehmann, F. (2005). Are exports and imports of Chile cointegrated? Ibero-America Institute for Economic Research, Working Paper 11.
<http://ideas.repec.org/p/got/iaidps/111.html>
- Hollauer, G., and Mendonca, M. (2006). Testing Brazilians' imports and exports cointegration with monthly data for 1996–2005. Instituto de PesquisaEconômicaAplicada, Discussion Paper 1154.
<http://ideas.repec.org/p/ipe/ipetds/1154.html>
- Husted, S. (1993). The emerging US current account deficit in the 80s: A cointegration analysis. *The Review of Economics and Statistics* 74(1).
<http://ideas.repec.org/a/tpr/restat/v74y1992i1p159-66.html>
- Husted, S., 1992. The emerging US current account deficit in the 1980s: a cointegration analysis. *Review of Economics and Statistics* 74.
- Kao, C., Chiang, M.-H., 1998. On the Estimation and Inference of a Cointegrated Regression in Panel Data, Working Paper, Center for Policy Research, Syracuse University.
- Mann, C. L. (2002). Perspective on the US current account deficit and sustainability. *Journal of Economic Perspectives* 16(3).
<http://ideas.repec.org/a/aea/jecper/v16y2002i3p131-152.html>
- Obstfeld, M., Rogoff, K., 1996. Foundations of International Macroeconomics. MIT Press.
- Pedroni, P., 1995. Panel Cointegration: Asymptotic and Finite Sample Properties of Pooled Time Series Tests, with an Application to the PPP Hypothesis, Indiana University Working Papers in Economics.
- Pedroni, P., 1999. Critical values for cointegration tests in heterogeneous panels with multiple regressors, *Oxford Bulletin of Economics and Statistics*, Special Issue.
- Ramona, D., and Razvan, S. (2009). Analysis of the Romanian current account sustainability. *Annals of faculty of Economics* 1(1).
<http://ideas.repec.org/a/ora/journal/v1y2009i1p163-168.html>
- sustainability. *Annals of faculty of Economics* 1(1).
<http://ideas.repec.org/a/ora/journal/v1y2009i1p163-168.html>
- Verma, R., and Perera, N. (2008). An empirical analysis of sustainability of trade deficit: Evidence from Sri Lanka. *International Journal of Applied Econometrics and Quantitative Studies* 5(1).
http://ideas.repec.org/a/ea/ijaeqs/v5y2008i1_6.html
- Wu, J., Chen, S., and Lee, H. (2001). Are current account deficits sustainable? Evidence from panel cointegration. *Economics Letters* 72(2).
<http://ideas.repec.org/a/eee/ecolet/v72y2001i2p219-224.html>
- Wu, J.-L., 2000. Mean reversion of the current account: evidence from the panel data unit-root test. *Economics Letters* 66.
- Zivot, E., and Andrews, D. W. K. (1992). Further evidence on the great crash, the oil-priceshock, and the unit root hypothesis. *Journal of Business and Economic Statistics* 10(3). <http://ideas.repec.org/a/bes/jnlbes/v10y1992i3p251-70.html>.

Appendix :**Summary of recent contributions on current account sustainability**

| Studies | Countries and samples covered | Methodology | Sustainability |
|---------------------------------------|--|---|--|
| Arize (2002) | 50 countries, 1973–1998 | Johansen's cointegration test | 31 out of 50 countries hold |
| Baharumshah et al. (2003) | Indonesia, Malaysia, the Philippines, and Thailand, 1961–1999 | Unit root test, Gregory-Hansen cointegration test with regime shift | Violated |
| Christopoulos and León-Ledesma (2010) | US, 1960–2008 | Kapetanios et al. (2003) STAR unit root test | Held |
| Chortareas et al. (2004) | Argentina, Bolivia, Brazil, Chile, Colombia, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, and Venezuela, 1970–2000 | Kapetanios and Shin (2002) Threshold unit root test | Held |
| Chu et al. (2007) | 48 African Countries Breuer et al. (2002) | SURADF panel unit root test | 37 out of 48 held |
| Dulger and Ozdemir (2005) | G-7 countries, 1974–2001 | Fractional unit root test | France, Italy, Canada held Germany, the UK, the US, Japan violated |
| Herzer and Nowak-Lehmann (2006) | Chile, 1975–2004 | Unit root test Gregory-Hansen cointegration test with regime shift | Held |
| Holmes (2006) | 11 OECD countries, 1980–2002 | Panel cointegration | Australia, Belgium, Canada, Japan, the UK, the USA Hold France, Germany, Italy, Norway, Spain violated |
| Ismail and Baharumshah (2008) | Malaysia, 1960–2004 | Unit root test Cointegration test | Held |
| Kalyoncu (2006) | 22 OECD countries, 1960–2002 | Panel unit root test | Held |
| Kim et al. (2009) | Indonesia, Korea, Malaysia, the Philippines, Thailand, 1981–2003 | Park and Shintani (2005), non-linear unit root test | Held |
| Konya (2008) | Czech Republic, 1993–2006 Hungary, 1990–2006 Slovenia, 1992–2006 | test Unit root Cointegration test | Czech Republic hold Hungary held Slovenia violated |

| | | | |
|-----------------------------|--|---|--|
| Lau and Baharumshah (2005) | Asian-12: Bangladesh, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka and Thailand, 1970–2002 | Breuer et al. (2002) | Violated except Bangladesh, Korea and Singapore |
| Lau et al. (2006) | Asian-5: Indonesia, Korea, Malaysia, the Philippines and Thailand, 1976–2001 | Panel unit root test | Held |
| Liu and Tanner (2001) | G-7 countries, 1970–1990 | Unit root test with and without break | Thw US, the UK, Germany, Japan, Canada violated |
| Matsubayashi (2005) | US, 1975–1998 | Unit root, cointegration test | Held |
| Narayan and Narayan (2002) | 22 least developed countries, 1960–2000 | test Pesaran et al. (2001) ARDL cointegration | 6 out of 22 held |
| Narayan and Narayan (2004) | Fiji, Papua New Guinea, 1980–2001 | Pesaran et al. (2001) ARDL cointegration test | Held |
| Onel and Utkulu (2006) | Turkey, 1970–2002 | Zivot–Andrews Unit root test, Gregory-Hansen cointegration test with regime shift | weakly held |
| Ogus and Sohrabji (2009) | Turkey, 1992–2004, | Unit root test Cointegration test | Violated |
| Raybaudi et al. (2004) | Argentina, 1992–2001, Brazil, 1995–2002 Japan, the UK, the US, 1970–2002 | Switching ADF unit root test | Brazil, Japan, the UK held Argentina, the US violated |
| Wu (2000) | 10 OECD countries | Panel unit root test | Held |