CURRENT ACCOUNT SUSTAINABILITY IN MIDDLE EAST AND AFRICA (MEA) COUNTRIES: EVIDENCE FROM PANEL DATA

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ABSTRACT

Countries in the Middle East and Africa (MEA) have diverse economic structures. Some countries are oil exporters, some are oil importers and some countries are very poor dependent on agriculture. Since current account is an important indicator of an economy’s health, it is of interest to examine if current account balances in MEA region are sustainable. However, empirical research paid scant attention to this issue. No study has been conducted before to examine this issue. The present paper makes an attempt to fill this research gap by employing panel data model over the period from 1995 to 2014 to examine current account sustainability in MEA countries. We follow intertemporal budget constraint approach and examine long-run relationship between export and import plus interest on net foreign debt. As we work with panel data, we pay special attention to cross-section dependence. We use annual data collected from World Development Indicators. All data (exports, imports and interest on long-term external borrowing) are in current US dollar and expressed as percentage of GDP. Interest payment on long-term external borrowing (also in current US dollar) is used as a proxy for interest on net foreign debt.

Panel unit root test to cross-section dependence indicate variables are first-difference stationary. We next use panel cointegration and bootstrap critical values under null hypothesis to accommodate cross-section dependence. Panel cointegration result suggests that current account is sustainable. However, panel cointegrating regression estimation indicates that the value of sustainability coefficient is less than 1 (one), which implies that current account is weakly sustainable.

As current account is weakly sustainable, it is desirable to make policy intervention at macro level to ensure strong sustainability. This may be achieved by accelerating ongoing trade reforms in MEA countries to boost export earnings and hence ensure the ability of external debt in the long run.

JEL classification: F32, F34, F41
Key words: Current account, sustainability, cross-section dependence, panel unit root, panel cointegration, MEA countries

INTRODUCTION

Current account measures a country’s net export of goods and services to the rest of the world, typically, over one year period. Current account, either deficit or surplus, is an important indicator of the health of an economy. Persistent current account deficits tend to increase domestic interest rate and also imposes excess burden on future generations to pay the deficit, which reduces their standard of living (Apergis et al., 2000). Similarly, persistent current account surplus may indicate inefficient financial intermediation, it may also be the result of excess saving caused by lack of social insurance and all these factors lead to low investment and other distortions in the economy (Blanchard and Milesi-Ferretti, 2011). However, research mainly focuses on the issues related to current account deficit, since it exerts more harmful effects on the economy than current account surplus does. Persistent current account deficit raises the question of a country’s ability to service and repay its debt (Wickens and Uctum, 1993). Large scale external disequilibrium caused by high and unsustainable current account deficit may work as an indicator of financial crisis. Kaminsky, Lizondo, and Reinhart (1998) and Edwards (2001) show that high current account deficit increases the probability of monetary crisis. Moreover, unsustainable current account deficit is an indication of a government’s failure to
fulfil the intertemporal budget constraint. Despite its harmful effects on the economy it is argued that as long as markets are efficient, current account deficit reflects the optimal decisions of rational borrowers and lenders (Belkar et al., 2007) and hence any effort to correct the deficit is considered to be welfare reducing. Investigating the sustainability of current account deficit has, therefore, been a serious agenda of research in international finance and economics.

This paper aims to examine whether current account balance in Middle East and African (MEA) countries are sustainable in the long run. MEA region consists of countries with diverse economic characteristics. It includes oil-exporting countries, such as Algeria, Bahrain, Iran, Nigeria and Saudi Arabia as well as oil-importing countries, such as, Jordan, Lebanon, Mauritania, and Syria. Some countries are poor and depend on agriculture, such as, Benin, Burkina Faso, Burundi, Guinea-Bissau and Lesotho, while some countries are classified as emerging markets and depend on tourism, such as, Mauritius and Turkey. This diverse economic structure of countries makes the MEA region a vital candidate for research on current account sustainability. Although there has been substantial research on current account sustainability in many regions and countries in the world\(^1\), it is surprising to note that no systematic research has been undertaken for the MEA region. Some studies examine current account for specific group of countries. For example, Calderón et al. (2001) examines the current account balance in African countries and find that in the short run it is 3% of gross national disposable income above the equilibrium level. Aristovnik (2007) finds that domestic and foreign investments have negative, while openness, higher oil price and domestic economic growth have positive effect on current account balances in Middle East and North African countries. Morsey (2009) examines the determinants of current account balance in oil exporting countries and concludes that fiscal balance and underground oil wealth are significant determinants of current account balance under various alternative specifications. In addition to fiscal balance, Gnimassoun (2015) documents that floating exchange rate is the most effective tool in Sub-Saharan African countries in preventing absolute current account imbalance.

**TABLE 1: A BRIEF ACCOUNT OF RESEARCH ON CURRENT ACCOUNT SUSTAINABILITY**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study period</th>
<th>Econometric method(s) employed</th>
<th>Sample</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghosh and Ostry (1995)</td>
<td>1970 - 1990</td>
<td>Unit root and cointegration</td>
<td>45 developing countries</td>
<td>Not sustainable</td>
</tr>
<tr>
<td>Wu et al. (1996)</td>
<td>1973:Q4 – 1994:Q4</td>
<td>Unit root and cointegration</td>
<td>The USA and Canada</td>
<td>Not sustainable</td>
</tr>
<tr>
<td>Ostry (1997)</td>
<td>1960 - 1990</td>
<td>Unit root and cointegration</td>
<td>Countries in Association of Southeast Asian Nations (ASEAN)</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Wu (2000)</td>
<td>1977:Q1 – 1997:Q4</td>
<td>Panel unit root test</td>
<td>Canada, Japan, France, Germany, Italy, the Netherlands, Spain, Australia, the USA and the UK</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Wu et al. (2001)</td>
<td>1973:Q2 – 1998:Q4</td>
<td>Panel unit root and panel cointegration</td>
<td>Canada, Japan, France, Germany, Italy, the USA and the UK</td>
<td>Sustainable</td>
</tr>
</tbody>
</table>

\(^1\) Table 1 presents a representative list of studies on current account sustainability.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Dates</th>
<th>Methodology</th>
<th>Countries</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baharumshah et al.</td>
<td>1961–1999</td>
<td>Unit root and cointegration</td>
<td>Indonesia, Malaysia, the Philippines and Thailand</td>
<td>Not sustainable</td>
</tr>
<tr>
<td>Keong et al.</td>
<td>1959–2000</td>
<td>Unit root and cointegration</td>
<td>Malaysia</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Cheong</td>
<td>1961–2001</td>
<td>Unit root and cointegration</td>
<td>Malaysia</td>
<td>Not sustainable</td>
</tr>
<tr>
<td>Lau et al. (2006)</td>
<td>1976:Q1–2001:Q4</td>
<td>Unit root</td>
<td>Indonesia, South Korea, Malaysia, the Philippines and Thailand</td>
<td>Not sustainable</td>
</tr>
<tr>
<td>Ismail and Baharumshah (2008)</td>
<td>1960–2004</td>
<td>Unit root and cointegration</td>
<td>Malaysia</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Kalyoncu and Kaplan</td>
<td>1981–2008</td>
<td>Unit root and cointegration</td>
<td>Countries in Association of Southeast Asian Nations (ASEAN)</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Pattichis</td>
<td>1976–2004</td>
<td>Unit root, cointegration and error correction model</td>
<td>Cyprus</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Campa and Gavilan</td>
<td>1970–2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenidge et al.</td>
<td>1960–2006</td>
<td>Cointegration and Dynamic OLS (DOLS)</td>
<td>Barbados</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Holms et al. (2011)</td>
<td>1950–2003</td>
<td>Unit root, cointegration and Vector Error Correction Model (VECM)</td>
<td>India</td>
<td>Unsustainable until late 1990s and sustainable afterwards</td>
</tr>
<tr>
<td>Bajo-Rubio et al.</td>
<td>1970–2007</td>
<td>Cointegration and error correction model</td>
<td>OECD countries</td>
<td>Sustainable for Austria, Canada, Italy &amp; New Zealand. For other countries results are not clear-cut.</td>
</tr>
<tr>
<td>Donoso and Martin</td>
<td>1970–2010</td>
<td>Linear and non-linear unit root tests</td>
<td>Latin American countries</td>
<td>Sustainable except Argentina, Brazil, Chile and Paraguay.</td>
</tr>
<tr>
<td>Lanzafame</td>
<td>1980–2008</td>
<td>Linear and non-linear panel unit root test</td>
<td>27 advanced economies</td>
<td>Sustainable with nonlinear adjustments</td>
</tr>
<tr>
<td>Singh</td>
<td>1950/51–2009/10</td>
<td>Unit root and cointegration</td>
<td>India</td>
<td>Sustainable</td>
</tr>
</tbody>
</table>
From the discussion above and literature cited in Table 1 it is clearly evident that so far sustainability of current account balance in MEA region has not been investigated. The current paper is an attempt to fill this research gap. This is the first paper to examine current account sustainability in MEA region with panel data model. Our results indicate that despite oil and commodity priced shocks, economic reforms undertaken in different African countries and global financial crisis, current account balance in the region is found to be sustainable in the short run, which offers significant policy prescription for the countries in the region.

ANALYTICAL FRAMEWORK

A simple analytical framework proposed by Husted (1992) is used in this paper. This framework requires that a country’s exports and imports be cointegrated as an evidence of current account sustainability. The framework assumes a representative consumer, living in an open economy that produces and exports single composite goods without any government sector. The consumer can borrow and lend in international financial market at a given world interest rate and maximizes lifetime utility subject to budget constraint. The current period budget constraint of this individual is given by:

\[ C_0 = Y_0 + B_0 - I_0 - (1 + r)B_1 \]  

(1)

Where, \( C_0, Y_0, I_0, r, B_0 \) are respectively current consumption, output, investment, one period world interest rate and international borrowing. The world interest rate is assumed to be stationary with unconditional mean \( r \) and \((1 + r_0)B_1 \) is the size of initial debt. Since equation (1) must hold every period, intertemporal budget constraint can be derived by iterating (1) forward as follows:

\[ B_n = \sum \gamma (X_t - M_t) + \lim_{n \to \infty} \gamma_n B_n \]  

(2)

where \( X_t - M_t = Y_t - C_t - I_t \) is the trade balance in period \( t \) and \( \gamma \) is the discount factor defined as \( \prod_{t=0}^\infty \lambda_t \), where \( \lambda \) is defined as \( \lambda_0 = \frac{1}{1 + r} \). According to Equation (2) the amount a country borrows (or lends) in international market is equal to the discounted present value of its future trade surpluses (deficits), provided that the last term equals zero. If it is not zero, then the country is involved in making “bubble financing” or Pareto-inferior decisions. Thus, the crucial part of the equation is to test whether \( \lim_{n \to \infty} \gamma_n B_n = 0 \). Husted (1992) expressed equation (1) as follows and derives a testable empirical model:

\[ Z_t + (1 + r)B_{t-1} = X_t + B_t \]  

(3)

where, \( Z_t = M_t + (r - r)B_{t-1} \) denotes the sum of imports and additional interest payment on international debt, which depends on whether the world rate is below or above its long-run mean value. Following Hakkio and Rush (1991), Husted solves equation (3) forward and obtains the following:

\[ M_t + rB_{t-1} = X_t + \sum_{j=0}^\infty \lambda^{1+j} (\Delta X_{t-j} - \Delta Z_{t-j}) + \lim_{j \to \infty} \lambda_{t-j} B_{t-j} \]  

(4)

where, \( M_t + rB_{t-1} \) represents import plus interest on net foreign debt. Husted makes further assumption that \( X_t \) and \( Z_t \) are random walk with drift and can be expressed as follows:

\[ X_t = \phi_1 + X_{t-1} + \varepsilon_{1t} \]  

(5)

\[ Z_t = \phi_2 + Z_{t-1} + \varepsilon_{2t} \]  

(6)

Substituting (5) and (6) into (4) and rearranging it can be written as:

\[ X_t = \alpha + \beta M_t + \lim_{j \to \infty} \lambda^{1+j} B_{t-j} + \mu \]  

(7)

where, \( \beta M_t = M_t + rB_{t-1}; \) \( \alpha = [(1 + r)](\phi_1 - \phi_2) \) and \( \mu = \sum_{j=0}^\infty \lambda^{1+j} (\varepsilon_{2j} - \varepsilon_{1j}) \). Finally Husted assumes that the limit term in equation (7) is zero and expresses the equation in standard regression form as follows:

\[ X_t = \alpha + \beta MM_t + \mu \]  

(8)
In equation (8) if \( X_i \) and \( MM_i \) are cointegrated with the long-run coefficient \( \beta \leq 1 \) necessary and sufficient condition for sustainability may be weaker (Holms, 2006). In case \( \beta < 1 \), the current account is non-stationary and can grow without limit. Therefore, sufficient condition for current account sustainability should be cointegrated \( X_i \) and \( MM_i \) and long-run coefficient in equation (8) \( \beta = 1 \).

ESTIMATION METHOD AND DATA

Cross-sectional dependence

A major concern of panel data model estimation is the likely presence of substantial cross-sectional dependence (CSD) caused by the common shocks and unobserved components. For inter-country perspective the reason for this cross-sectional dependence is the growing economic and financial integration, (Hoyos and Sarafidis, 2006). If CSD is not properly addressed in the estimation, the estimators will not be consistent and panel estimation may provide little gain over single-equation estimation (Phillips and Sul, 2003). In the present study the cross-section units are countries in the Middle-East and Africa, which are equally prone to various regional and global developments. So, there is a strong case for CSD among the panel members. In order to examine this dependence we employ CSD test proposed by Pesaran (2004). The Pesaran CSD-test employs the correlation-coefficients between the time-series for each panel member. In our case \( N = 41 \), this will give \( 41 \times 40 = 1640 \) correlations between country \( i \) and all other countries, for \( i = 1 \) to \( N - 1 \). Pesaran (2004) CSD statistic is computed as

\[
\hat{\rho} = \sqrt{\frac{2T}{N(N-1)} \left( \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right)},
\]

where \( \hat{\rho} \) is the estimated correlation coefficient between the time-series for country \( i \) and \( j \).

Panel unit root test

Many different types of unit root tests are available in the literature to examine unit root in panel data set. The most widely used tests are Levin-Lin (LL), Im-Persaran-Shine’ test (hereafter called IPS test) and Maddala-Wu test (Maddala 2001). These are first-generation test and, these ignore cross-sectional dependence that "arises from unobserved common factors, externalities, regional and macroeconomic linkage, and unaccounted residual interdependence" (Bangake and Eggoh 2012, p 10). The second-generation test is Pesaran’s (2007) tests, which represents Cross-sectional Augmented IPS (CIPS) tests and allows for cross-sectional dependence heterogeneity in the autoregressive coefficient of the Dickey-Fuller regression. Thus, the study uses Maddala and Wu’s test and Pesaran’s Cross-sectional dependence IPS (CIPS) statistics to examine the panel unit root tests. The Maddala and Wu’s (1999) augmented Dickey-Fuller test of panel unit roots without the common factor is,

\[
\Delta \tilde{y}_{it} = \alpha_i + \beta_i \tilde{y}_{i,t-1} + \epsilon_{it}
\]

Accounting common factor the new Correlated augmented Dickey-Fuller (CADF) model is

\[
\Delta \tilde{y}_{it} = \alpha_i + \beta_i \tilde{y}_{i,t-1} + \epsilon_{it} + \sum_{j=1}^{p} \delta_{ij} \Delta \tilde{y}_{i,j,t} + \epsilon_{it}
\]

where, \( \tilde{y}_t \) denotes vectors of cross-sectional average of dependent variable. And CIPS statistic is:

\[
CIPS = \frac{1}{n} \sum_{t=1}^{n} \hat{\epsilon}_t
\]

Cointegration test

This paper uses a relatively new cointegration test proposed by Westerlund (2007). Unlike residual-based cointegration tests, this test is free from common factor restriction. Common factor restriction is referred to the requirement that the long-run cointegrating vector for the variables in their levels being equal to the short-run adjustment process for the variables in their first differences (Kremers et al, 1992). This common factor restriction is forwarded as a plausible explanation for the failure of null hypothesis in many studies when cointegration is strongly suggested in theory, such as Ho (2002). Another advantage of this new cointegration test is that it handles the problem of cross-sectional dependence by bootstrapping the critical values of the test statistics.

In this new cointegration test, four test statistics are proposed; two are designed to test the alternative that the panel is cointegrated as a whole, while the other two are designed to test the alternative that variables in at least one cross-section unit are cointegrated. The former two statistics are referred to as group statistics, while the later two are referred to as panel statistics. The data generating process in this test is assumed to be as follows:
\[ y_{it} = \phi_{it} + \phi_{2it} + z_{it} \]  \hspace{1cm} (12)
\[ x_{it} = x_{it-1} + v_{it} \]  \hspace{1cm} (13)

where \( t \) and \( i \) represent time and space dimensions of data, respectively. In this formulation, the vector \( x_{it} \) is modeled as a pure random walk and \( y_{it} \) is modeled as the sum of the deterministic term \( \phi_{it} + \phi_{2it} \) and a stochastic term \( z_{it} \). This term is modeled as follows:

\[ \alpha_i(L) \Delta z_{it} = \alpha_i(z_{it-1} - \beta_i x_{it-1}) + \gamma_i(L) v_{it} + e_{it} \]  \hspace{1cm} (14)

where,

\[ \alpha_i(L) = 1 - \sum_{j=1}^{p} \alpha_{ij} L^j \] and \( \gamma_i(L) = \sum_{j=0}^{k} \gamma_{ij} L^j \)

Now substituting equation (12) into equation (13) gives the following error correction model for \( y_{it} \)

\[ \alpha_i(L) \Delta y_{it} = \delta_i t + \delta_{2it} + \alpha_i(y_{it-1} - \beta_i x_{it-1}) + \gamma_i(L) v_{it} + e_{it} \]  \hspace{1cm} (15)

where,

\[ \delta_i = \alpha_i(1) \phi_{2i} - \alpha_i \phi_{it} + \alpha_i \phi_{2it} \] and \( \delta_{2it} = -\alpha_i \phi_{2it} \)

In equation (15) above, the vector \( \beta_i \) defines a long run equilibrium or cointegrating relationship between the variables \( x \) and \( y \). However, in the short run there might be disequilibrium, which is corrected by a proportion \(-2 < \alpha_i \leq 0\) each period. Here, \( \alpha_i \) is called error correction parameter. If \( \alpha_i < 0 \), then there is error correction and the variables are cointegrated and if \( \alpha_i = 0 \), then there is no error correction and the variables are not cointegrated. The test statistics are given by\(^2\)

**Group test statistics**

\[ G_{tr} = \frac{1}{N} \sum_{i=1}^{N} \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \]  \hspace{1cm} (16.a)
\[ G_{\alpha} = \frac{1}{N} \sum_{i=1}^{N} \frac{T \hat{\alpha}_i}{\hat{\alpha}_i(1)} \]  \hspace{1cm} (16.b)

**Panel statistics:**

\[ P_{\hat{\alpha}} = \frac{\hat{\alpha}}{SE(\hat{\alpha})} \]  \hspace{1cm} (17.a)
\[ P_{\alpha} = T \hat{\alpha} \]  \hspace{1cm} (17.b)

**Data**

Annual data from 1995 to 2014 on 41 countries (country list are given in Table A1 in Appendix A) are collected from World Development Indicator online data base of World Bank. Country selection is mainly dictated by

\(^2\) For derivation of these statistics, please see Westerlund (2007).
data availability. Out of 41, only 4 (four) countries are included from Middle East (i.e. Iran, Jordan, Lebanon and Turkey) and the rest 37 countries are from Africa. Complete dataset for other countries in Middle East are not available. We collect data on variables specified in equation (8). All data (exports, imports and interest on long-term external borrowing) are in current US dollar and expressed as percentage of GDP. Interest payment on long-term external borrowing (also in current US dollar) is used as a proxy for interest on net foreign debt.

ESTIMATION RESULTS

Cross-section dependence

We begin our estimation procedure by looking at the cross-section dependence (CSD) by employing Pesaran’s (2004) CSD test. Table 2 reports CSD test statistic and probability values (p-value) along with the correlations of the variables (here, X and MM) among cross-section units. Under null hypothesis the variables are independent across cross-section units. Zero p-values indicate that the null is rejected and there is evidence of significant cross-section dependence, which is also evident from the correlation values.

TABLE 2: CROSS-SECTION DEPENDENCE TEST

<table>
<thead>
<tr>
<th>Variables</th>
<th>CSD test statistic</th>
<th>p-value</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>10.74</td>
<td>0.000</td>
<td>0.337</td>
</tr>
<tr>
<td>MM</td>
<td>14.66</td>
<td>0.000</td>
<td>0.385</td>
</tr>
</tbody>
</table>

Panel unit root test

Having found evidence of significant cross-section dependence, we examine the stationarity property of the data with Pesaran’s (2007) panel unit root test that accounts for cross-section dependence in data. Table 3 reports the unit root tests results both for level and first difference of the variables.

TABLE 3: PANEL UNIT ROOT TEST

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test statistic at level</th>
<th>Test statistic at first difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>Constant &amp; trend</td>
</tr>
<tr>
<td>X</td>
<td>-2.110</td>
<td>-2.394</td>
</tr>
<tr>
<td>MM</td>
<td>-2.358</td>
<td>-2.239</td>
</tr>
</tbody>
</table>

Regression of the unit root test is run both with constant and constant & trend. Critical value of the test at 1% significance level, when regression is run with constant, is -2.36 and it is -2.85 when the regression is run both with constant and trend. The results reported in Table 3 clearly indicate that both X and MM are first difference stationary after accommodating for cross-section dependence, i.e., they are I(1) variables at 1% significance level.

Panel cointegration

With I(1) variables we next proceed to examine whether X and MM are cointegrated in the long run with Westerlund (2007) test of cointegration. Since there is evidence of significant cross-section dependence, we bootstrap the critical values to obtain robust p-values. Table 4 reports Westerlund (2007) cointegration test results.

TABLE 4: PANEL COINTEGRATION TEST RESULT

<table>
<thead>
<tr>
<th>Test statistic</th>
<th>Value</th>
<th>p-value</th>
<th>Robust p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$G_t$</td>
<td>-1.505</td>
<td>0.001</td>
<td>0.004</td>
</tr>
<tr>
<td>$G_a$</td>
<td>-3.518</td>
<td>0.656</td>
<td>0.130</td>
</tr>
<tr>
<td>$P_t$</td>
<td>-10.207</td>
<td>0.000</td>
<td>0.002</td>
</tr>
<tr>
<td>$P_a$</td>
<td>-3.354</td>
<td>0.000</td>
<td>0.002</td>
</tr>
</tbody>
</table>

In Table 4 robust p-values are obtained by bootstrapping critical values under null hypothesis with 1000 replications. We are particularly interested in panel statistic $P_t$ and $P_a$ and both are highly significant, that is, the
null hypothesis of no error correction is rejected. Presence of error correction indicates that X and MM are cointegrated in the long run, in other words, current account in MEA region is sustainable as outlined in Husted (1992). Although X and MM are cointegrated in the long run, the equilibrium relation may deviate temporarily in the short run due to various macroeconomic shocks. We can easily find out the time it takes to correct the temporary deviation and restore the equilibrium relation by estimating the error correction parameter \( \hat{\alpha} \) by rearranging Eq. (17.b) as follows: \( \hat{\alpha} = \frac{P_a}{T} \). In our sample T = 20 and from Table 4 we have \( P_a = -3.354 \), therefore, that is, almost 17% of the deviation is corrected each year.

Although according to Husted (1992) cointegration between X and MM is the evidence of current account sustainability, Quintos (1995) identifies two forms of sustainability as follows:

(a) Current account is strongly sustainable if X and MM are cointegrated and \( \beta = 1 \).
(b) Current account is weakly sustainable if either (i) X and MM are cointegrated and \( 0 < \beta < 1 \), or (ii) X and MM are not cointegrated and \( \beta = 1 \).

We have established that X and MM are cointegrated; therefore, in order to determine whether current account is strongly sustainable we estimate the value of \( \beta \) by running two cointegrating regressions in panel: panel dynamic OLS (PDOLS) and panel fully modified OLS (PFMOLS). Kao and Chiang (2000), Mark and Sul (1999, 2003), and Pedroni (2001) extend the DOLS estimator of Saikkonen (1992) and Stock and Watson (1993) to panel setting. Similarly PFMOLS is an extension of Phillips and Hansen’s (1990) fully modified OLS estimator to panel setting offered by Phillips and Moors (1999), Pedroni (2000), and Kao and Chiang (2000). Estimated values of \( \beta \) from PDOLS and PFMOLS are reported in Table 5.

### TABLE 5: VALUES OF \( \beta \) IN PANEL COINTEGRATING REGRESSIONS

<table>
<thead>
<tr>
<th>Method</th>
<th>Coefficient</th>
<th>Stand. error</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDOLS (without trend)</td>
<td>0.3341</td>
<td>0.0432</td>
<td>7.72</td>
<td>0.000</td>
</tr>
<tr>
<td>PDOLS (with trend)</td>
<td>0.3219</td>
<td>0.0540</td>
<td>5.96</td>
<td>0.000</td>
</tr>
<tr>
<td>PFMOLS (without trend)</td>
<td>0.3095</td>
<td>0.0345</td>
<td>8.96</td>
<td>0.000</td>
</tr>
<tr>
<td>PFMOLS (with trend)</td>
<td>0.2442</td>
<td>0.0365</td>
<td>6.67</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Each regression is estimated with and without trend, resulting altogether in four coefficients of \( \beta \). All coefficient values are substantially less than 1 pointing to the fact that current account in MEA region is weakly sustainable. However, to support this conclusion statistically we conduct a Wald test for coefficient restriction with null hypothesis \( \beta = 1 \). The results, reported in Table 6, show that the null is rejected in all cases at a very high significance level, since \( p \)-values are zero. We can, therefore, conclude with sound statistical support that current account balance in MEA region is weakly sustainable, since X and MM are cointegrated and \( 0 < \beta < 1 \).

### TABLE 6: WALD TEST OF COEFFICIENT RESTRICTION

<table>
<thead>
<tr>
<th>Test statistic</th>
<th>PDOLS (without trend)</th>
<th>PDOLS (with trend)</th>
<th>PFMOLS (without trend)</th>
<th>PFMOLS (with trend)</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-statistic</td>
<td>-15.38</td>
<td>-12.54</td>
<td>-19.98</td>
<td>-20.64</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>F-statistic</td>
<td>236.66</td>
<td>157.38</td>
<td>399.33</td>
<td>426.41</td>
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<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

### CONCLUSION

This paper aims to evaluate the current account sustainability of Middle East and African (MEA) countries in the framework of intertemporal budget constraint approach. Our panel cointegration test indicate that export and import plus interest on net foreign borrowing are cointegrated, which is an indication of current account sustainability. However, when we estimate the value of the coefficient in the cointegrating regression, we find that it is less than 1 (one), which indicates that current account is weakly sustainable. We do not find any evidence supporting strong sustainability of current account in the region. This may be caused by the dominance of African countries in the sample. Majority of African countries suffered debt and macroeconomic crisis in the 1980s, which led them to adopt trade liberalization in the early 1990s (Rodrik, 1993). Trade liberalization improved the international competitive position of the countries in Africa; they still have a long way to go. African countries still have very low level of intra-regional industry trade, indicating low economies of scale;
high transportation cost remains a barrier of trade (UNECA, 2013). As the current account is weakly sustainable, we should not be content with this sustainability. To achieve strong current account sustainability the region needs to adopt policies and agenda to boost export earnings and ensure that future generations are not burdened with debt accumulated for current consumption.

REFERENCE

7. Blanchard, Oliver and Milesi-Ferretti Gian Maria, 2011, ‘(Why) should current account balanced be reduced?’, IMF Staff Discussion Note no. SDN/11/03, International Monetary Fund (IMF), Washington D.C.


APPENDIX A

TABLE A1: LIST OF COUNTRIES

<table>
<thead>
<tr>
<th>Country</th>
<th>Country</th>
<th>Country</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Congo, Republic</td>
<td>Lesotho</td>
<td>Rwanda</td>
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<tr>
<td>Angola</td>
<td>Egypt</td>
<td>Madagascar</td>
<td>Senegal</td>
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<td>Benin</td>
<td>Gabon</td>
<td>Malawi</td>
<td>South Africa</td>
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<td>Gambia</td>
<td>Mali</td>
<td>Sudan</td>
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<td>Ghana</td>
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<td>Tanzania</td>
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<td>Cameroon</td>
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<td>Morrocco</td>
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<td>Kenya</td>
<td>Mozambique</td>
<td>Turkey</td>
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<td>Jordan</td>
<td>Nigeria</td>
<td>Uganda</td>
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<td>Niger</td>
<td>Zambia</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Zimbabwe</td>
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