Jordan's Current Account Deficit Sustainability

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Abstract: - Objective: This study seeks to assess the sustainability of Jordan's current account deficit using annual data from 1990 to 2020, while also addressing policy implications to ensure its sustainability in the Jordanian economy. Design/Methodology/Approach: The sustainability dynamics of the current account deficit are analyzed through Husted's intertemporal budget constraint approach. With the Johansen cointegration test, Empirical research on long-term dynamics is conducted. Utilizing the Error Correction Model (ECM), the conventional economic examination is additionally broadened to disclose short-term dynamics. Results: According to the Johansen cointegration analysis's findings, Jordan's current account deficit is likely to be sustainably large as long as income and expenditures are cointegrated with coefficients below 1. The VEC supports the long-term study's findings, this demonstrates the yearly 99.7% correction for long-term equilibrium aberrations. Research Limitations/Implications: Unlike Husted's intertemporal budget constraint approach, which examines the equilibrium between current account (CA) revenues and expenditures to gauge the viability of the trade balance (TB), the sustainability of the deficit hinges on the type of capital inflows utilized to fund it. Therefore, based on the Husted model, it is important to analyze the implications of Jordan's current account deficit sustainability. Originality/Value: Numerous empirical research looks into current account sustainability because external imbalances make it difficult for emerging nations to fully integrate into the global economy. Most of these studies emphasize the long-term development of CA deficits. In contrast to past research, this work additionally examines the current account balance's short-term volatility. As a result, the study's novelty lies in its analysis of the dynamics of short- and long-term sustainability of the current account.

Key-Words: - Current account, Nexus export-import, Intertemporal budget constraint approach, Vector error correction model, Unit root tests, Log-run, Jordan.

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1 Introduction

Developing nations encounter structural challenges in their economies due to the concentration of production, leading to a heavy reliance on a single product in most cases. These economies typically depend on the extraction of natural resources like oil, gas, copper, and various minerals, or they engage in agricultural production such as coffee and bananas. Consequently, this focus exposes these countries to multiple risks. First of all, because of the huge variations in export income brought on by the unstable prices of core exports, many countries suffer long-term instability in their balance of payments. Their potential to accomplish long-term economic growth and development is negatively impacted by this. Furthermore, the concentration of manufacturing makes these nations vulnerable to sharp swings in the worldwide demand for the fundamental items they manufacture. The income and economic growth of these nations may suffer significantly if there is a drop in the market for these goods or if their prices decrease. These nations are thus obliged to keep a close eye on the fluctuations in their current accounts and economic activity. In order to increase its economic stability and expand its prospects for sustainable growth, it must work to diversify its income streams and move away from relying exclusively on one product. To achieve this, one might encourage economic diversification, human capacity development, innovation and technology promotion, and the growth of other industries.

As a result, they find it difficult to maintain long-term consumption levels that are higher than their entire production. Therefore, even if they endure

short-term current account deficits, developing countries must address their long-term structural issues in order to overcome their output constraints. This suggests that the current account's sustainability, [1].

In open economies that have access to international markets, the current account deficit has become increasingly important as an indicator of alterations in a country's net national debt and its capacity to meet foreign loan obligations. As outlined by [2], the current account can be dissected further to encompass factors such as exports, imports, national savings (S), and investments.

The country might be able to sustain its CA deficit in the short run. However, there are doubts about its capacity and willingness to eventually settle its debts due to this ongoing deficit. As long as the global community is willing to cover the country's CA shortfall, sustainability should not pose a problem. Nevertheless, there will come a point when creditors cease lending to nations with substantial debt burdens that face potential default, rendering the practice of repaying existing loans with new ones unsustainable, akin to a Ponzi scheme. In such a scenario, the economy will veer off its long-term trajectory, necessitating adjustments to various factors and policies, [3].

Based on these facts and the theories of international trade, which place a strong emphasis on trade openness, this can result in more national consumption and economic success than a closed state. The gap is filled by importing goods and services from outside, yet, if the production capacity is limited or inefficient, it may not be able to fulfill the local consumption demands of products and services. In this situation, as demand for imported products rises, there is a growth in the trade imbalance, which is covered by borrowing from abroad or taking out loans from foreign lenders. This indicates that the nation borrows money from other nations to make up for its trade imbalance, [4] and [5].

A sizable and ongoing current account deficit has been present in Jordan since 1990. The deficit in the current account as a percentage of gross national product (GNP) was 29.1% in 1990, 25.5% in 2000, and 20.7% in 2010. When it peaked in 2017, it varied to 20.5%. Despite this, the current account deficit showed positive behavior throughout the subprime mortgage crisis, with the deficit as a percentage of GDP falling from 35.6% to 20.7% in 2010 (UNCTAD).

Drawing from the mentioned sources and considering Jordan's consistent trade deficit, as indicated by [5], this research aims to assess the viability of the country's CA deficit from 1990 to 2020. The study utilizes the [6] framework known as the "intertemporal budget constraint approach" to examine the sustainability dynamics of the current account deficit. In this economic analysis, Johansen's cointegration test and an ECM are employed as analytical techniques.

The main question is why a country like Jordan, which is a significant source of potash, phosphates, vegetables, and fruits, and a transit point between countries in the region, is experiencing a current account deficit. Can it be explained by a set of economic variables, or is it the result of policy-maker decisions?

The remaining sections are arranged as follows: An overview of the empirical research on this topic is included in Section 2, together with a theoretical backdrop that includes the intertemporal budget constraint approach developed by [6] and [7]. The dataset, methodology, and typical economic findings are all described in Section 3. In order to ensure that the current account deficit in the Jordanian economy can continue, various policy considerations are then presented.

2 Background Theory

[6], presents a streamlined model for evaluating the sustainability of current account deficits, drawing from the concept of International Borrowing Capacity (IBC) introduced by [7]. The intertemporal perspective on current account balance posits a durable connection between exports and imports. This study aims to contribute to the existing literature by applying the IBC approach to assess the viability of Jordan's current account deficits. Below is the representation of the budget constraint for the present period:

$$C_t=Y_t+B_t- I_t- (1 +r_t)B_{t-1} \quad (1)$$

In equation (1), C_t represents current consumption, Y_t denotes output, B_t represents international borrowing, represents an investment, and r_t for the interest rate for one period. The term $(1+r)\ B_{t-1}$ is equivalent to the initial loan amount, which represents the country's debt to other nations. Given that $Y_t - C_t - I_t$ displays the trade balance (TB) - ($TB_t=X_t-M_t$ where X: exports and M: imports), equation (1) can be rewritten as:

$$B_t-B_{t-1}= r_t\ B_{t-1} -TB_t \quad (2)$$

Upon making various assumptions (for detailed information, refer to [6]), the following testable model can be derived:

$$X_t=\alpha+\gamma\, MM_t+v_t \quad (3)$$

Whereas net interest payments (NIP) and net transfer payments (NTP), both X_t and MM_t refer to the export and import of products and services, respectively. The presence of a stable error component, in equation (3) as v_t, implying an I(0) process, is necessary for the economy to satisfy the intertemporal budget constraint (IBC), which is a requirement for satisfying the weak version of CA sustainability. In contrast, The strong version of current account sustainability requires the existence of a cointegration connection and the cointegrating vector γ = [-1, 1], which suggests that the *X* and *M* series do not diverge considerably over time.

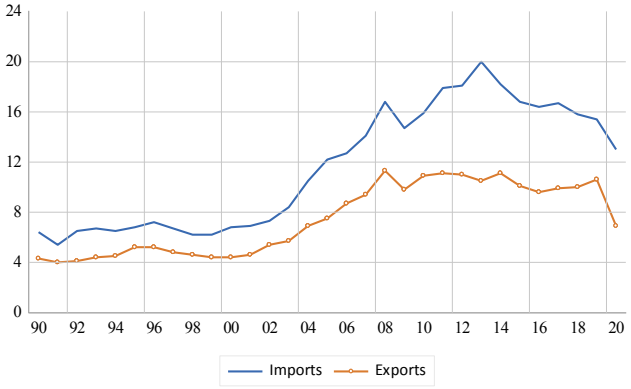

Fig. 1: illustrates the graphical representation of X and MM

3 Results

3.1 Data

For the purpose of conducting an empirical analysis, the study uses data with yearly observations from 1990 to 2020. The information is broken down into four categories: net transfer payments (NTP), net interest payments (NIP), imports of goods and services (MM), and exports of goods and services (X). The measure of imports is created by multiplying MM by NTP and NIP to produce MM. The study's variables were all represented in logarithmic form. The World Bank, UNCTAD, and Central Bank of Jordan statistical databases were used to collect the data. A visual depiction of the data is shown in Figure 1.

3.2 Empirical Findings

The integration order of the variables must be established before to doing the analysis on the time-series data. To evaluate the properties of univariate time-series data, unit root tests such as the Augmented Dickey-Fuller (ADF) test [8] and the Phillips-Perron (PP) test [9] are frequently employed. Table 1 displays the results of these unit root testing. The findings show that the non-stationarity null hypothesis cannot be ruled out for all the variables at their initial levels based on the ADF and PP tests. The integration order of exports and imports is therefore 1 [I(1)], confirming their non-stationary character.

Table 1. Unit root tests performed with Break.

	ADF		PP	
Variables	WithoutTrend	WithTrend	WithoutTrend	WithTrend
X				
Levels	-1.29 (0)	-0.39 (0)	-1.29[1]	-0.37[1]
FirstDifference	-4.44 (0)***	-4.53 (0)***	-4.86[1]***	-4.71[1]***
MM				
Levels	-1.07 (0)	-0.42 (0)	-1.13[1]	-0.87[1]
FirstDifference	-4.36 (0)***	-4.50 (0)***	-4.50[1]***	-4.60[1]***

Once we have established that all variables have the same order of integration, we can proceed with the Johansen multivariate cointegration tests, which allow us to examine the sustainability of the current account balance in the long run.

Applying a typical unit root test to time series data in the presence of structural fractures might provide incorrect findings. [10], presented unit root tests that take into account these gaps in the time series to get more accurate results. A unit root test that takes structural breakdowns into consideration is also used in this investigation. Table 2 displays the outcomes of the Zivot and Andrews Unit Root Test. The unit root tests carried out with various structural breaks show that, as shown in the table, both the X and MM variables display stationarity at the initial differences. In other words, the Zivot and Andrews unit root test implies that both X and MM are stationary and take structural breakdowns into consideration.

Table 2. Findings from the Zivot and Andrews Unit Root Test

			Breakpoints	t	
X	Level	Intercept	2003	-3.07	I(1)
		Intercept+trend	2004	-3.43	
	1.difference	Intercept	2008	-5.51***	
		Intercept+trend	2001	-6.33***	
M	Level	Intercept	2003	-3.33	I(1)
		Intercept+trend	2010	-4.40	
	1.difference	Intercept	2013	-6.13***	
		Intercept+trend	2013	-6.89***	

The variables are steady at the 1% significance level, as shown by the asterisk (*). SIC was used to automatically choose the lag lengths for the Zivot and Andrews structural break unit root test (maxlag=10).

Prior to establishing the count of cointegrating vectors, it is crucial to opt for the lag order within the vector autoregressive (VAR) model. This choice

must strike a balance: it should be sufficiently large to ensure that the error terms in the equations exhibit no autocorrelation while remaining small enough for manageable estimation. In practical terms, this decision relies on information criteria such as the Akaike information criterion (AIC) or the Schwarz Bayesian criterion (SBC). In the context of this research, the model selection criteria led to the determination that a lag order of 2 was most appropriate for the VAR model. Table 3 presents the outcomes of the Johansen-Juselius cointegration tests.

The second issue is the existence of deterministic components in the cointegration space, such as trends and constants, which affect the asymptotic distribution of the cointegration test results. In our study, we investigate three potential outcomes:

1. Model 2 restricts the intercept within the cointegration space by assuming that there are no linear trends in the data levels.
2. The occurrence of linear trends in the data levels is allowed by Model 3.
3. Within the cointegration space, Model 4 takes a trend into account.

As was already mentioned, the Pantula principle guides the choice of the proper model. First, we choose the model with the highest degree of constraint (rank 0, Model 2), and for Models 2, 3, and 4, we compare the trace test statistic to an Osterwald-Lenum critical value. In the event that this model is not accepted, we proceed to Model 3 while keeping the same rank. This iterative method is carried out repeatedly until the null hypothesis is finally accepted.

Table 3. Test of Johansen-Juselius Cointegration

	Model 2 (restricted intercept, no trend)		Model 3 (unrestricted intercept, no trend)		Model 4 (unrestricted intercept, restricted trend)	
Null	Test Statistics	95% Critical Value	TraceStatistics	95% Critical Value	TraceStatistics	95% Critical Value
Trace Statistics						
r=0*	**21.15**	**20.26**	21.02	15.41	22.10	25.87
r<=1	3.35	9.16	3.35	3.84	4.30	12.51
Maximum Eigenvalue						
r=0*	**17.80**	**15.89**	17.37	14.26	17.75	19.38
r<=1	3.35	9.16	3.35	3.84	4.30	12.51

Model 2 with a rank of 0 is the most appropriate model, according to the Pantula Principle. The null hypothesis of no cointegration cannot be ruled out using either the maximum eigenvalue or trace statistics, which suggests that current account deficits are not sustainable. However, it is important to consider the possibility of structural breaks in the data that may influence the test results and favor the acceptance of the null hypothesis. Therefore, more research utilizing different techniques that can take into consideration any structural fractures in the data is necessary.

According to the findings of the cointegration study, Jordan's current account series shows a persistent relationship across time. As such, the amount of the CA deficit throughout the relevant period can be regarded as sustainable. The cointegrating vector's long-term coefficients are an essential factor to take into account while assessing sustainability. The computed cointegration vector coefficient should ideally equal 1 in order for the CA deficit to be very sustainable.

The results of the long-term cointegration equation estimates are displayed in Table 4. These results imply that the MM coefficient value of the current account expense is positive. For a connection to be stable, coefficient (b) should have a value of 1. The resultant value (0.85) shows that there isn't much of a divergence from 1. This implies that there's a good chance the current deficit will persist. Therefore, based on real data, it is possible that Jordan's current account deficit will persist throughout the study period.

Table 4. Long Run Estimation Results

Variables	Coefficients	Probability
C	0.05	
MM	0.85***	0.000

*Note: The significant values at the 1% and 5% significance levels are represented by *** and **, respectively.*

3.3 Error Correction Model Estimation

In order to analyze the variables' short-term dynamics and interactions, we expanded our analysis by employing the Error Correction Model. This model allows us to capture the deviations of the cointegrated series from their long-term equilibrium relationship over time. The precise equation that was applied in our investigation to determine the Error Correction Model is Equation 3.

$$\Delta X_t = \varphi + \sum_{i=1}^{n} \theta_i \, \Delta MM_{t-i} + \sum_{i=0}^{n} \alpha_i \, \Delta X_{t-i} + \delta \left(X_{t-1} - \gamma \, MM_{t-1} \right) + \varepsilon_t \quad (4)$$

In this study, we anticipate that the error correction term's coefficient will be statistically significant and negative. This result's confirmation suggests that the variables will eventually converge to their equilibrium levels. The equilibrium state, symbolized by the coefficient " γ " serves as a gauge for how long the current account will remain sustainable. The Error Correction Term (ECT), on the other hand, gives a measurement of the current account's imbalance and represents how quickly

corrections take place to restore equilibrium. To put it another way, any transient departures from the equilibrium state are gradually rectified, and the ECT coefficient controls the speed of correction.

Table 5 displays the estimation outcomes of the error correction model. It demonstrates the statistically significant negative ECT coefficient. Therefore, even if they diverge from it in the near term, the X and MM series converge to their long-term equilibrium. The convergence rate for each period is represented by the ECT coefficient, which is 99.7%. Consequently, it's evident that the model's equilibrium value, representing 99.7% of the difference between the observed value and itself, diminishes annually. In simpler terms, long-term deviations from equilibrium are rectified at a rate of 99.7% each year.

As would be predicted, the first, second, and third terms of the CA expenditure (MM) have coefficients that positively affect the current account income (X). These outcomes offer more proof that the acquired long-run analysis is reliable.

The R^2 value (0.14) indicates that the model in Equation 3 has a limited capacity to explain the connection under study, which is relevant for diagnostic testing. Additionally, the outcomes of the Breusch-Godfrey LM test show that the model does not exhibit autocorrelation, and the White test verifies that there is no variance issue.

Table 5. Estimation Error Correction Model Results

Variables	Coefficients	Probability
ECT_{t-1}	**-0.997410****	**0.05**
$AdjR^2$	0.135874	
Breusch-Godfrey LM test	5.985665	0.2002
White Test	1.863156	0.1244

4 Conclusion

Sustaining the current account deficit is important for promoting long-term economic growth in Jordan and other countries. Therefore, this paper studied the dynamics of the current account deficit in Jordan using the Johansen cointegration test and the error correction model during the period 1990 to 2020.

The results showed that there is a significant relationship between current account returns and expenditures in Jordan, with a coefficient close to 1, indicating a high level of sustainability of the current account deficit. The results showed a long-term relationship with deviation from equilibrium returning to equilibrium at a rate of 99.7%.

Given the presence of a chronic deficit in the Jordanian current account during the period 1990-2020, the study recommends diversifying local production and diversifying exports, with emphasis on exports of local goods. And by replacing imports with locally manufactured goods. Which in result will improve the balance of payments and increase the gross domestic product and therefore reducing the trade deficit.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

I, Khaled Al-Sawaie, contributed fully to the present research, at all stages from the formulation of the problem to the final findings and solution.

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Conflict of Interest

The authors have no conflicts of interest to declare.