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The Nexus Between Oil Prices and Current Account Deficit: An Empirical Analysis for Lebanon

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Abstract

This study examines the impact of short and long-term oil prices on Lebanon's current account deficit during the period of 2002 to 2008, utilizing monthly data. The investigation employs the Johansen Cointegration Test to explore the relationships between the variables. The Johansen Cointegration Test establishes a long-term connection between the series, indicating a sustained relationship. To delve into the short-term dynamics, we utilize the Vector Error Correction Model (VECM). The results of this model reveal a negative and statistically significant error correction term. This suggests that any short-term deviations from equilibrium are expected to revert in the long run.

Keywords: Current Account Deficit, Oil Prices

JEL Codes: Q43, P48

1. INTRODUCTION

With the escalating significance of energy challenges, recent literature has placed a heightened focus on the repercussions of energy prices on macroeconomic indicators. Against this backdrop, the nexus between energy prices and macroeconomic indicators has become a critical area of study, garnering attention from policymakers, economists, and researchers alike. The intricate relationship between a nation's economic performance and the dynamics of energy costs has prompted comprehensive analyses aimed at unraveling the complexities involved. Lebanon, with its substantial dependence on imported energy, faces a unique set of challenges that magnify the consequences of global energy price fluctuations. The country's vulnerability to external shocks is underscored by the fact that approximately 75% of its energy needs are met through imports, rendering it susceptible to geopolitical events, supply disruptions, and international market volatility. Furthermore, the repercussions extend beyond the immediate economic sphere, permeating various facets of the social and political landscape. As energy costs escalate, the burden on households and businesses in Lebanon intensifies, leading to potential socio-economic unrest. The intricate interplay between energy prices, inflation rates, and unemployment becomes a crucial aspect that necessitates a holistic understanding to formulate effective policy responses.

In light of these challenges, researchers are delving into the specific mechanisms through which energy prices influence Lebanon's macroeconomic indicators. Analyses encompass the direct impact on trade balances, fiscal deficits, and the overall balance of payments. Additionally, the indirect effects on industries such as manufacturing, transportation, and agriculture are under scrutiny, as these sectors are intricately linked to energy consumption. Addressing the energy conundrum in Lebanon requires a multifaceted approach that combines policy initiatives, investment in renewable energy sources, and strategic planning for energy security. Moreover, international collaborations and diplomatic efforts to diversify energy sources can play a pivotal role in mitigating the risks associated with overreliance on imported energy. As the world grapples with the evolving landscape of energy challenges, Lebanon's experience serves as a poignant case study, emphasizing the need for proactive measures to navigate the intricate web of economic, social, and political implications tied to energy prices. The ongoing research in this field not only sheds light on Lebanon's unique circumstances but also contributes valuable insights that can inform global strategies for achieving a sustainable and resilient energy future.

The current account deficit has become a focal point of discussion among economists in Lebanon, recognized as one of the most formidable challenges confronting the nation's economy. Lebanon's significant foreign dependence for energy is a key contributor to the notable deficit in the Balance of Trade, a fundamental component of the Current Account balance. Official statistics from the Ministry of Energy and Natural Resources reveal that out of the $77 billion current account deficit, energy imports alone contribute $54 billion, representing approximately 70% of the overall deficit. This study aims to unveil the nexus between the current deficit—posing serious risks to the Lebanese economy—and energy imports, identified as a primary driver of the budget shortfall. Employing econometric analysis, the research delves into the consequences of oil price fluctuations on the current account balance, utilizing oil price data as a proxy for energy pricing.

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2. THE CURRENT ACCOUNT BALANCE AND OIL CONSUMPTION

The intricacies of the Current Account balance and its connection to a nation's economic health underscore the challenges faced by countries in maintaining equilibrium in their external trade relations. In the case of Lebanon, the perpetual current deficit reflects a persistent struggle to balance its international commerce, with energy imports playing a pivotal role in shaping this economic landscape. Lebanon's reliance on imported oil as a primary source of energy exposes it to the volatility of global oil markets. The inability to tap into domestic oil reservoirs exacerbates the situation, leaving the country highly dependent on external sources. As a consequence, any uptick in global oil prices places a substantial burden on Lebanon's Current Account, contributing to a widening deficit. The linkage between oil prices and Lebanon's current deficit is further complicated by Turkey's role as an energy importer. The energy dynamics in Turkey, particularly its poor price elasticity of oil demand, magnify the impact on Lebanon. When oil prices rise, Lebanon faces an intensified financial strain due to increased oil expenditures. This phenomenon not only elevates the existing current deficit but also underscores the interconnectedness of global economic factors influencing Lebanon's economic stability. The repercussions of Lebanon's permanent current deficit extend beyond the economic realm, seeping into broader macroeconomic dynamics. The need to continually finance the deficit places pressure on other components of the Balance of Payments, particularly the Capital and Finance Account. A sustained deficit in the Current Account necessitates a surplus in the Capital Account to maintain an overall balance. However, this reliance on capital inflows, often in the form of foreign debt, can give rise to significant economic challenges, potentially leading to issues such as inflation, currency depreciation, and heightened financial vulnerability. As Lebanon grapples with the intricate dance of balancing its Current Account, the imperative for strategic measures becomes evident. Diversifying energy sources, investing in renewable energy, and exploring avenues for domestic energy production are avenues that may help mitigate the impact of external energy dependencies. Additionally, proactive economic policies and international collaborations could play a crucial role in stabilizing Lebanon's macroeconomic dynamics, paving the way for a more resilient and sustainable economic future.

3. LITERATURE REVIEW

The intricate relationship between oil prices and macroeconomic variables continues to be a focal point in academic discussions, with numerous studies exploring the impact of oil prices on current account balances globally. Notably, research on this subject has delved into specific cases, including Lebanon, shedding light on the unique dynamics at play in the context of energy-importing nations. Demirbaş, Turkay, and Türkolu's (2009) study, spanning from 1984 to 2008, adds valuable insights to the discourse surrounding Lebanon's current account balance and its sensitivity to oil price fluctuations. Their findings, revealing a positive association between oil prices and Lebanon's current deficit, align with the broader consensus that energy-importing countries experience a negative impact on their trade balance when faced with increasing oil prices. This positive correlation suggests that as oil prices rise, Lebanon's current account balance is adversely affected, reflecting the country's dependence on imported energy.

Contrastingly, Wijnbergen's (1984) research during the same period provides an intriguing perspective by uncovering a negative link between the current account balance and oil price shocks. This discrepancy in findings underscores the complexity of the relationship between oil prices and macroeconomic indicators, with factors such as economic structure, policy responses, and global market conditions influencing the outcomes. The divergence in results among studies highlights the need for a nuanced understanding of the multifaceted interactions between oil prices and current account balances.

The research conducted by Karabulut and Elikel Danşolu (2006) not only extends the discourse on the impact of oil prices on current account deficits but also broadens the scope by highlighting that the issue is not exclusive to emerging economies like Turkey but also extends to industrialized nations, exemplified by the United States. Their findings, indicating a statistically significant positive association between oil prices and the current deficit, underscore the universality of the challenges posed by energy-related factors on a country's external trade balance. The assertion that energy usage is a primary contributor to the current account deficit resonates with the broader understanding of the role of energy in shaping macroeconomic dynamics. As countries, both emerging and industrialized, grapple with the implications of increasing energy costs, the need for comprehensive analyses becomes imperative.

Examining the impact of energy price changes on macroeconomic indicators, Rafiq, Salim, and Bloch's (2009) study focusing on the Thai economy contributes to the growing body of literature in this field. The findings of their research emphasize the significant influence of oil price variations on key macroeconomic factors such as unemployment and investment. This highlights the intricate interplay between energy costs and broader economic parameters, underlining the multifaceted consequences that fluctuations in oil prices can trigger. The Thai economy, as studied by Rafiq et al., serves as a specific case illustrating the tangible effects of oil price variations. The linkage between oil prices, unemployment, and investment underscores the ripple effect that energy-related shocks can have on diverse aspects of an economy, further emphasizing the need for policymakers to develop adaptive strategies that consider the interconnected nature of these variables. As the global economy navigates the challenges posed by energy dynamics, research endeavors like these provide valuable insights into the complex relationships between oil prices and macroeconomic indicators. The lessons drawn from diverse national contexts contribute to a more nuanced understanding of the challenges and opportunities associated with energy-related variables, fostering informed policymaking for both emerging and industrialized economies alike.

4. RESULTS OF ANALYSIS

In the subsequent section of the study, the analytical outcomes are systematically presented, beginning with an assessment of the stationarity findings derived from the Augmented Dickey-Fuller (ADF) Unit Root and Phillips-Perron (PP) Unit Root Tests. These tests are crucial in establishing the stationarity status of the variables under consideration. Recognizing the importance of unit root tests and the incorporation of stationary modes in the analysis, these initial steps are essential to ensure the reliability and robustness of subsequent analyses. By scrutinizing the stationarity of the series, the study lays the groundwork for a more accurate understanding of the dynamics at play. In the subsequent sections of the study, these analytical components are woven together to construct a cohesive narrative, allowing for a nuanced interpretation of the empirical results.

Table 1: Stationarity Test of Model Variables

Variables	ADF			PP		
	Intercept	Trend &Intercept	First Difference	Intercept	Trend &Intercept	First Difference
CA	-0,650	-1,615	-16,90	-1,703	-3,452	-16,79
OP	-2,007	-3,359	-6,054	-1,766	-2,830	-6,054
IPI	-0,988	-1,919	-18,69	-0,936	-3,346	-19,63

This thorough examination not only enhances the credibility of the study but also provides a solid foundation for drawing meaningful conclusions and implications based on the empirical evidence presented.

The study adopts a meticulous approach to evaluate the stationarity of the variables, employing both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. The criteria for accepting or rejecting the null hypothesis are stringent, considering both the absolute value of the t-statistics and the probability values. A pivotal aspect of this evaluation is recognizing that while the series at the level may not be stationary, their initial differences demonstrate stationarity. Consequently, each series is categorized as integrated of order one, or I(1), indicating that their first differences are stationary. Given the stationary nature of the first differences, the study proceeds to assess the long-term relationships between these variables. To accomplish this, the Johansen methodologies, as proposed by Johansen in 1988 and Johansen/Juselius in 1990, are employed. The rejection of the null hypothesis, which posits no cointegrating vectors (r=0), is substantiated by the results presented in Table 2.

Both the Trace Statistics and the Max-Eigen Statistics surpass the critical values, leading to the rejection of the null hypothesis. This rejection is further validated by probability values that are consistently smaller than 0.05. Furthermore, the hypothesis related to the "Maximum 1 vector (r=1)" is also rejected, as the probability value exceeds 0.05, and both the Trace and Max-Eigen statistics fall below critical levels. This collective evidence suggests that the model under consideration exhibits one cointegrated vector, emphasizing the existence of a long-term association between the variables. The meticulous interpretation of these results not only confirms the I(1) nature of the variables but also underscores the robustness of the cointegration analysis. This rigorous methodology contributes to the study's credibility and provides a solid foundation for the subsequent exploration of long-term dynamics using the cointegrated vector identified. The findings thus far pave the way for a more in-depth understanding of the intricate relationships among the variables examined in this study.

Table 2: Johansen Cointegration Test

Hypothesis	Eigenvalue	Trace Statistics	0.05 Critical Value	Probability
H_0: r = 0*	0.221501	30.26251	29.79707	0.0442
H_0: r ≤ 1	0.039080	4.222218	15.49471	0.8848
H_0: r ≤ 2	0.000733	0.076309	3.841466	0.7824
Hypothesis	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Probability
H_0: r = 0*	0.221501	26.04029	21.13162	0.0094
H_0: r ≤ 1	0.039080	4.145910	14.26460	0.8436
H_0: r ≤ 2	0.000733	0.076309	3.841466	0.7824

The co-integration test results provide compelling evidence for the presence of a single co-integrated vector, signifying a long-term association among the variables under investigation—specifically, the current account balance (CAD), oil prices (OP), and the industrial output index (IPI). This pivotal finding establishes the foundation for exploring the dynamic relationships between these variables over an extended period. Subsequent to the identification of long-term linkages through co-integration, the study employs the Vector Error Correction Model (VECM) to estimate the parameters of the model. The VECM is a crucial tool in modeling and analyzing the dynamics of variables that exhibit co-integration. By incorporating the Error Correction Model, the study accounts for short-term adjustments towards the long-term equilibrium identified by the co-integrated vector.

Table 3 serves as a comprehensive repository of the Error Correction Model findings, presenting estimates that capture the interplay between the current account balance, oil prices, and the industrial output index. These estimates offer insights into how the variables respond to short-term deviations from their long-term equilibrium relationship, providing a nuanced understanding of the dynamic adjustments within the system. The Error Correction Model findings in Table 3 become a focal point for the subsequent stages of the analysis, enabling the study to draw meaningful conclusions regarding the short-term dynamics and the speed of adjustment towards the long-term equilibrium. As these results are scrutinized and interpreted, the study gains a deeper understanding of the intricate relationships among the variables, contributing valuable insights to the broader discourse on the economic interdependencies reflected in the current account balance, oil prices, and industrial output.

Table 3: Results of Vector Error Correction Model

Vector Error Correction Model	D(CA)
ECT_t	-0.243228
Standard Error	(0.08941)
t-statistics	[-2.72023]

The results from the Vector Error Correction Model (VECM), as displayed in Table 3, reveal insightful dynamics, particularly in the model where the current account balance (CA) serves as the dependent variable. The negative sign of the vector error correction term, denoted as -0.243228, is not only statistically significant but also carries substantial economic meaning. The negative coefficient on the error correction term indicates that there is a mechanism in place to rectify short-term deviations from the long-term equilibrium. In practical terms, this implies that when the current account balance experiences a short-term deviation from its equilibrium level, there is a negative force acting to bring it back towards the equilibrium position. This aligns with the intuitive economic notion that markets tend to correct imbalances over time. The magnitude of the coefficient provides additional insights. In this case, the coefficient of -0.243228 suggests that approximately 24% of the short-term deviations from equilibrium are corrected in the subsequent period (month) when the error correction term is taken into account. This implies a relatively strong and relatively rapid adjustment mechanism, indicating a notable degree of responsiveness in the system. Furthermore, the interpretation of the error correction term extends to the time frame within which these corrections occur. The statement that 24% of the deviations are erased in the next period (month) aligns with the idea that the system tends to revert to its long-term equilibrium relatively quickly in response to short-term shocks. According to the error correction term, it is estimated that the departure from short-run equilibrium is fully corrected within an average of 4.1 periods (months). In summary, the negative and statistically significant vector error correction term in the model signifies an effective adjustment mechanism that corrects short-term imbalances in the current account balance. The speed of this correction, as indicated by the magnitude of the coefficient, emphasizes the dynamic nature of the system and contributes valuable insights into the short-term dynamics of the interplay between the current account balance, oil prices, and the industrial output index.

5. CONCLUSIONS

This study delves into the impact of imported oil prices on Lebanon's current account balance through econometric approaches. Given the non-stationarity of the series at the levels, Johansen co-integration tests are employed to analyze the relationships between the variables. The findings reveal a long-term co-integration link between the series, emphasizing a sustained association. The subsequent step involves the computation of the vector error correction model, revealing a statistically significant negative signature in the vector error term. This signifies that short-run deviations from equilibrium are corrected in the long run. This mechanism is crucial in understanding how the current account balance responds to fluctuations in imported oil prices, highlighting the dynamic adjustments over time. Against the backdrop of the global economic landscape, recent volatility in oil prices has wielded a considerable impact on the economic policies of both industrialized and developing nations. This study aims to shed light on Lebanon's position as a nation significantly reliant on foreign sources for its energy needs and elucidate how changes in oil prices may affect its economic outlook. The notable point emphasized is the transitory nature of recent artificial drops in oil prices. The study underscores the importance of prompt action, signaling that while short-term fluctuations may occur, they are not likely to endure in the long run. This insight serves as a crucial call to action, urging policymakers and stakeholders in Lebanon to address the implications of oil

price changes promptly and strategically. The negative signature in the vector error term, indicative of the removal of short-run aberrations in the long run, underscores the resilience and adaptability of Lebanon's economy to external shocks. However, the study's implicit warning about the temporary nature of artificial drops in oil prices serves as a critical reminder for proactive measures and policies to navigate potential challenges that may arise in the future. In essence, the study provides valuable insights into Lebanon's economic landscape, urging timely responses to the complex interplay between oil prices and the country's current account balance.

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