Oil price dynamics and energy transitions in the Middle East and North Africa: Economic implications and structural reforms

Dagher, Leila and Fattouh, Bassam and Jamali, Ibrahim

2019

Oil price dynamics and energy transitions in the Middle East and North Africa: Economic implications and structural reforms

Leila Dagher, Bassam Fattouh, Ibrahim Jamali

Keywords: MENA; energy transition; sustainable energy; energy price reforms; oil prices

1. Introduction

There is a widespread consensus that the sharp fall in the price of oil between 2014 and 2016 has had adverse effects on economic growth in the Middle East and North Africa (MENA) region. The consequences of the precipitous decline in the price of oil were particularly pronounced for the oil exporters. Because the price of oil and the government expenditures of the oil-exporting countries move in tandem, the drop in the price of oil weighed on the fiscal space of oil-exporters (International Monetary Fund, 2019a). The oil-exporting countries with limited fiscal buffers were particularly prone to the negative repercussions of the oil price shock of 2014 (International Monetary Fund, 2019b). Oil-importers in the MENA also did not reap the benefits of the drop in the price of oil due to lower remittances as well as to a slowdown in regional growth. In sum, the oil price shock proved to be a drag on the output growth of MENA's oil exporting and importing economies (World Bank, 2016; International Monetary Fund, 2015a).

The decline in the price of oil has also had important policymaking implications. The prevailing low oil price environment, coupled with oil price volatility, provided the impetus for Gulf Cooperation Council (GCC) policymakers to embark on energy pricing and taxation reforms.[1]

As the world transitions to cleaner, more sustainable energy systems, the MENA countries are also experiencing important changes in their own energy markets. First, MENA countries are aiming at diversifying their energy mix increasing the share of natural gas and renewables. Second, oil-exporting MENA countries may attempt to increase their oil-exports' share in anticipation of a weaker demand for oil in the next decade.

The MENA region's massive resource base and the fact that oil and gas constitute the main source of comparative advantage for the region indicate that the oil and gas sector will continue to dominate MENA oil exporters' economies for the next few decades. However, the energy sector needs to play a more active role in the diversification process by extending the value chain and

[1] See, for example, International Monetary Fund (2015b, 2015c, 2016). The Kingdom of Saudi Arabia embarked on its VISION 2030 in an attempt to limit the economy's dependence on the revenues from exporting oil.

creating new industries through fostering backward and forward linkages. This has already been taking place, but such efforts need to accelerate.

2. Overview of the Special Issue

This special issue brings together 11 papers, which offer a multifaceted analysis of the unfolding energy transition in the MENA region as well as the effects of energy price fluctuations on the equity markets and economies of MENA countries. On the energy transition side, the contributions (Dhakouani *et al.*, 2020; Harajli *et al.*, 2020) examine the use of commercial-scale hybrid solar photovoltaic-diesel systems as well as the effect of renewable electricity on the reliability of the grid. In addition, three studies closely examine changes in energy demand as a result of changing markets: Gaies *et al.* (2020) study the energy consumption-financial development nexus, Marrouch and Mourad (2020) examine gasoline price demand using data from Lebanon, and Belaid and Harbaoui (2020) explore the relationship between renewable electricity consumption, non-renewable electricity consumption, CO_2 emissions, and GDP. Shehabi (2020) scrutinizes the effects of energy subsidy reforms, while Poudineh *et al.* (2020) investigate the electricity market reforms in the MENA countries.

A second stream of papers examines the effects of energy price fluctuations on the equity markets and economies of the MENA countries. More specifically, these contributions explore the equity and energy market nexus for the MENA economies (Abid *et al.*, 2020; Balcilar *et al.*, 2020), the effects of oil price conditions on the sovereign risk of MENA countries (Bouri *et al.*, 2020), as well as the response of the MENA economies' trade balances to oil price shocks (Jibril *et al.*, 2020). In sum, the eleven contributions comprising this special issue tackle different facets of the energy transition as well as the financial and economic implications of energy price fluctuation for the MENA economies.

Starting from an integrated appraisal approach, **Harajli *et al.* (2020)** evaluate hybrid solar-diesel systems in Lebanon, Iraq, and Palestine. Their assessment included several types of analyses, namely, an energy analysis, a life-cycle impact assessment, a financial appraisal, and an economic assessment. Based on the findings, various policy recommendations are given to help expedite the uptake of commercial solar PV-diesel systems.

Dhakouani, Znouda and Bouden (2020) utilize the Open Source energy MOdelling SYStem (OSeMOSYS), a cost-based long-term optimization software, on electricity data from Tunisia to

study system reliability impact on renewable energy integration. Through the use of simulations on two different scenarios (renewable energy scenario and business-as-usual scenario) and three reliability factors (99%, 98%, and 97%.), the authors obtain the resulting decrease in total installed capacities and hence the reduction in investment costs. Moreover, they discuss the advantages of peak clipping in this case.

Gaies *et al.* (2020) gauge the relation between financial development and energy consumption for eighteen MENA economies using dynamic panel data techniques for the period 1996 to 2014. Financial development is measured via banking indicators such as assets to Gross Domestic Product (GDP), deposits to GDP and money supply to GDP. The authors' empirical findings suggest a positive association between financial development and energy consumption for the eighteen MENA economies considered. The authors also uncover the existence of a nonlinear, inverse U-shaped, relationship between financial development and energy demand for the MENA region.

Using new and comprehensive monthly data on the sale of new and used cars in Lebanon, **Marrouch and Mourad (2020)** employ a vector autoregressive model to assess the response of automobile purchases to an increase in the price of gasoline. In line with ex ante expectations, the authors find that the buyers are more inclined to purchase fuel-efficient cars as the price of gasoline increases. This paper's findings demonstrate the importance of the price mechanism in enticing energy efficiency.

Within a panel framework **Belaid and Harbaoui (2020)** explore the relationship between renewable electricity consumption, non-renewable electricity consumption, CO2 emissions and GDP for 9 Mediterranean countries. The short-run and long-run causality findings indicate that non-renewable electricity consumption and economic growth stimulate CO2 emissions in southern and northern Mediterranean countries, while renewable electricity reduces them. This empirical evidence suggests that expansion of renewable energy sources is a viable strategy for addressing energy security and reducing carbon emissions.

Shehabi (2020) employs a general equilibrium model, which is underpinned by elements that are distinctive of the Kuwaiti economy's dependence on oil, to examine the effects of energy subsidy reforms in Kuwait. The author's primary goal is to study the link between energy subsidy reforms and accelerating economic diversification away from hydrocarbons revenues for Kuwait. Shehabi (2019)'s findings suggest that Kuwait's weak economic diversification can be ascribed to

structural impediments, such as locking of capital in the sovereign wealth fund and the dominance of oligopolies in the non-tradable services sectors, rather than to the "Dutch disease".

Poudineh, Sen and Fattouh (2020) argue that the long overdue reforms of the electricity sector in the resource-rich MENA economies should take a systems approach and be tailored to local contexts. More specifically, the integrated energy sector reform should focus on: energy price reforms, investment in energy efficiency, investment in alternative energy and collapsing silos between different energy vectors. Notwithstanding the complexities involved in such as approach, the MENA countries stand to gain a lot from a well-designed and implemented reform.

Following Kilian's (2009) methodology, **Jibril, Chaudhuri and Mohaddes (2020)** estimate three panel data models to study the asymmetric effects of oil supply shocks, shocks to global real economic activity, and oil-specific demand shocks on the oil, non-oil, and overall trade balances of a large sample of oil exporters and oil importers. While they do not find asymmetries in aggregate demand shocks (both increases and decreases in aggregate demand deteriorate trade balances), they do find evidence of strong asymmetries in the effects of oil supply shocks and shocks to global real economic activity. Whereas oil supply disruptions have muted impacts on trade balances for both oil exporters and importers, oil supply expansions have large effects.

Bouri, Kachacha and Roubaud (2020) examine the quantile dependence between oil prices and credit risk for a cross-section of eight MENA oil exporters and importers using daily data for the period February 14, 2011 to November 23, 2018. The authors' findings suggest that shocks to oil returns and volatility increase the sovereign risk of MENA oil-exporters and importers, particularly during the period of declining oil prices. One implication of the authors' findings is that policymakers can adjust the composition of the debt stock as well as select an opportune timing for the issuance of new debt based on the prevailing oil price environment.

Balcilar, Demirer and Hammoudeh (2020) investigate the asymmetric effect of oil price fluctuations on 44 emerging and frontier stock markets via a quantile-on-quantile approach. They find that oil risk exposures are heterogeneous across the emerging and frontier stock markets and detect the presence of asymmetric spillovers from the oil market into developing stock markets. The authors conclude that oil price risk serves as a systematic risk proxy, capturing the market's concerns regarding global growth expectations. A significant implication of the findings is that signals from the oil market, could be utilized by policy makers to improve models of stock market volatility.

Abid *et al.* (2020) explore the role of oil and gas markets as conduits for the propagation of the US equity market shocks to MENA equity markets. The empirical evidence gleaned from the authors' multifactor model sheds light on the role of energy markets in strengthening the dependence between the US and MENA equity markets during episodes of market stress. The paper also provides compelling evidence of contagion effects from US to MENA equity markets and emphasizes the role of oil and gas markets as channels for contagion.

Acknowledgments

The authors would like to thank all the participants in the "1st MENA Energy Economics Conference" held on December 6-7, 2018, at the American University of Beirut, Lebanon. All the papers in this special issue have been subjected to a blind peer-review process, involving at least two reviewers. We highly appreciate the reviewers' time and effort which greatly helped in improving the quality of the papers. We are also grateful to the Energy Policy handling editors and the editorial team for their support and guidance throughout the process. The authors are solely responsible for the views expressed here, as well as for any remaining errors and omissions.

References

Abid, I., Goutte, S., Guesmi, K., & Jamali, I. (2020). Transmission of shocks and contagion from US to MENA equity markets: The role of oil and gas markets. *Energy Policy* (forthcoming).

Balcilar, M., Demirer, R., & Hammoudeh, S. (2020). Quantile relationship between oil and stock returns: Evidence from emerging and frontier stock markets. *Energy Policy* (forthcoming).

Belaid, F., & Zrelli, M. H. (2020). Renewable and non-renewable electricity consumption, environmental degradation and economic development: Evidence from Mediterranean countries. *Energy Policy* (forthcoming).

Bouri, E., Kachacha, I., & Roubaud, D. (2020), Oil market conditions and sovereign risk in MENA oil exporters and importers. *Energy Policy* (forthcoming).

Dhakouani, A., Znouda, E., & Bouden, C. (2019). Impacts of energy efficiency policies on the integration of renewable energy. *Energy Policy* (forthcoming).

Gaies, B., Kaabia, O., Ayadi, R., Guesmi, K., & Abid, I. (2020), Financial development and energy consumption: Is the MENA region different?. *Energy Policy* (*forthcoming).*

Harajli, H., Kabakian, V., El-Baba, J., Diab, A., & Nassab, C. (2020). Commercial-scale hybrid solar photovoltaic-diesel systems in select Arab countries with weak grids: An integrated appraisal. *Energy Policy* (forthcoming).

International Monetary Fund (2015a), Regional economic outlook: Middle East and Central Asia Update, October 2015, Washington DC.

International Monetary Fund (2015b), Energy price reforms in the GCC—What can be learned from international experiences? Annual meeting of ministers of finance and Central Bank Governors November 10, 2015, Doha, Qatar.

International Monetary Fund (2015c), Tax policy reforms in the GCC countries: Now and How? Annual meeting of ministers of finance and Central Bank Governors November 10, 2015, Doha, Qatar.

International Monetary Fund (2016), Diversifying government revenues in the GCC: Next steps, Annual Meeting of Ministers of Finance and Central Bank Governors, October 26, 2016, Riyadh, Saudi Arabia.

International Monetary Fund (2019a), Regional Economic Outlook: Middle East and Central Asia, Update, October 2019, Washington DC.

International Monetary Fund (2019b), Regional economic outlook update: Middle East and Central Asia, Update, April 2019, Washington DC.

Jibril, H., Chaudhuri, K., & Mohaddes, K. (2020). Asymmetric oil prices and trade imbalances: Does the source of the oil shock matter?. *Energy Policy* (forthcoming).

Kilian, L. (2009), Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. *American Economic Review*, *99*(3), 1053-69.Marrouch, W., & Mourad, J. (2020). Effect of gasoline prices on car fuel efficiency: Evidence from Lebanon. *Energy Policy* (forthcoming).

Poudineh, R., Sen, A., & Fattouh, B. (2020), An integrated approach to electricity sector reforms in the resource rich economies of the MENA. *Energy Policy* (forthcoming).

Shehabi, M. (2020), Diversification effects of energy subsidy reform in oil exporters: Illustrations from Kuwait, Energy Policy (forthcoming).

World Bank (2016), MENA quarterly economic brief: Whither oil prices? Issue 7, July 2016, Washington DC.

Authors

Leila Dagher, Associate Professor, Department of Economics, American University of Beirut, P.O. Box 11-0236, Riad El-Solh, Beirut 1107 2020, Lebanon. Tel: +961-3-308891, Fax: +961-1-744461, Email: ld08@aub.edu.lb.

Bassam Fattouh, Director, Oxford Institute for Energy Studies, 57 Woodstock Rd, Oxford, UK, Email: bassam_fattouh@oxfordenergy.org

Ibrahim Jamali, Associate Professor, Department of Finance, Accounting and Managerial Economics, Olayan School of Business, American University of Beirut, Beirut 1107 2020, P.O. Box 11-0236, Riad El-Solh Street, Lebanon, Email: ij08@aub.edu.lb. Fax: +961-1-750 214. Tel: +961-1-340 460 (ext. 3770).