ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية

Working Paper Series

25TH ERF ANNIVERSARY

THE IMPACTS OF OIL PRICE SHOCKS ON TOURISM RECEIPTS FOR SELECTED MENA COUNTRIES: DO STRUCTURAL BREAKS MATTER?

Khalid M. Kisswani, Amjad M. Kisswani
and Arezou Harraf

Working Paper No. 1305

THE IMPACTS OF OIL PRICE SHOCKS ON TOURISM RECEIPTS FOR SELECTED MENA COUNTRIES: DO STRUCTURAL BREAKS MATTER?

Khalid M. Kisswani[1], Amjad M. Kisswani[2] and Arezou Harraf[3]

Working Paper No. 1305

April 2019

Send correspondence to:
Khalid M. Kisswani
Gulf University for Science and Technology
kisswani.k@gust.edu.kw

[1] ERF Research Fellow, (Department of Economics and Finance, Gulf University for Science and Technology, Kuwait), (P.O. Box 7207, Hawally, 32093, Kuwait), Tel. (+965) 2530-7339, Fax (+965) 2530-7030

[2] E-mail: kisswan3@unlv.nevada.edu (Department of Workforce Development and Organizational Leadership, University of Nevada-Las Vegas, Nevada, USA), Tel. (+702) 338-8448, Fax (+702) 895-4436

[3] E-mail: a.harraf@bhck.edu.kw (Department of Business administration, Box Hill College, Kuwait), Tel. (+965) 2545-8626, Fax (+965) 2545-8600

First published in 2019 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

One of the short comings in the tourism literature is that research on the oil price-tourism receipts nexus is limited. However, the available studies, to the best of our knowledge, provide limited evidence on the negative effect of oil prices on tourism receipts. Nevertheless, the related literature did not consider the structural breaks in the analysis, which proven to be important in the empirical work. As such, in this paper, we study the oil price-tourism receipts nexus for selected MENA countries in the presence of structural breaks. This is done by adopting the autoregressive distributed lags (ARDL) bounds test and incorporating the structural breaks. The findings show that the bounds test provide evidence of a long-run relationship between tourism receipts and oil prices after integrating structural breaks into the ARDL model for most countries.

Keywords: tourism receipts, Oil price, cointegration, ARDL, structural breaks

JEL Classifications: Z30, Z38, Q40.

1. Introduction

Tourism noticeably depends on oil prices, given that oil prices are direct driver of tourism supply and demand. Theoretically, oil prices would affect tourism activities through direct and/or indirect channels. According to Meo *et al.* (2018), when oil prices increase this affect travelers' wages through higher inflation rates, which will in turn affect travelers' choice among options of visited countries and trips' budgets. Furthermore, higher oil prices would increase fees paid for tourism activities in visited countries. This will have a negative effect on travelers' budget, and hence, their choices of destinations and tourist activities. Besides, oil price increases are known to affect airlines directly, increasing the cost of travel, especially for long travel distances (for more details see: Naccache; 2010, Dogrul and Soytas; 2010, Katircioglu *et al.*; 2015, and Meo *et al.*; 2018, among others). As such, it is evident that without understanding how oil prices affect tourism travel patterns, it would become hard for managers and policymakers to achieve the projected plans of tourism, given that higher oil prices are unavoidable. Hence, this paper tends to shed light on the effect of oil prices on tourism for 10 major MENA countries (due to data availability constraint). This is done due to the fact that the economies of these countries depend heavily on tourism revenues, especially most of the selected countries are oil importers. Remarkably, previous work has focused on developed countries, whereas little attention has been offered to the developing countries. Therefore, the major objective of this paper is to contribute to the literature in this area by examining the long-run relationship (cointegration) between tourism receipts and oil prices for the selected MENA countries. Moreover, in this paper we pay attention to the structural breaks (an unexpected shift in a time series that can lead to huge forecasting errors and unreliability of the model in general) in testing the long-run relationship. Gregory *et al.* (1994) show that conventional cointegration tests are biased towards accepting the null of no-cointegration in the presence of structural breaks.

In this paper we employ the Autoregressive Distributed Lag (ARDL) bounds approach (which was initially introduced by Pesaran and Shin (1999) and further extended by Pesaran *et al.* (2001)), to examine the long-run nexus between oil prices and tourism receipts. On the whole, this paper contributes to the literature by diverging from the existing studies in three major ways. First, in this paper we pay attention to the possibility of the presence of structural breaks in the sample data, especially that the time period (1995-2014) went through numerous remarkable events that could have caused the long-run relationship to change. Previous studies in the tourism literature ignored such breaks, and this might be the reason for not finding long-run effect among the involved variables. Second, this paper looks at the MENA countries as compared to the vast majority of the tourism literature that have focused on the developed economies. Third, till this moment, few studies have looked at the oil price-tourism receipts nexus, where such association needs more attention. Hence, in this paper we aim to fill this gap in the literature, by examining the oil price-tourism receipts nexus.

The association amongst tourism demand and the economic fundamentals, such as oil price fluctuations, is vital for practitioners and government policymakers. oil is believed to be among the main drivers of the economic activities in both the developed and developing countries. the United Nations World Tourism Organization (UNWTO) warned against the negative effects of oil prices on tourism. UNWTO (2010) reports that high oil prices influenced many segments of the tourism industry (e.g. airlines, tourist arrivals, recreation visits, etc.). Interestingly, the tourism literature is rare in terms of analyzing the effects of oil price shocks on tourism. Recently, tourism researchers begun to pay attention to the oil price-tourism nexus. Most of this research documented a negative effect of oil prices on tourism (Yeoman *et al.*, 2006 and 2007; Becken, 2008; Becken *et al.*, 2009; Becken and Lennox, 2012; Becken, 2011; Small and Sweetman, 2009; Becken and Schiff, 2010). However, given that these studies focused on the developed economies, it is of empirical interest to see the impacts of oil price changes on tourism for the MENA countries.

The rest of the paper is organized as follows. Next Section describes the model employed and the data used. Whereas, Section 3 reports the empirical findings, and Section 4 provides a summary and conclusion.

2. Methodology

This paper examines the impacts of oil price shocks on tourism receipts for 10 selected MENA countries (Algeria, Egypt, Iran, Israel, Jordan, Lebanon, Morocco, Oman, Tunisia, and Turkey). For this reason, we use annual sample data from 1995 to 2014. The sample includes nominal Brent oil price (quoted in US dollars), US consumer price index (CPI; base = 2010), nominal international tourism receipts (quoted in US dollars)[4], and international tourism arrivals.[5] The tourism data is extracted from the World Bank website, whereas the oil price data as well as the CPI are extracted from the International Financial Statistics (IMF). The selection of the countries and time span was mainly due to data availability. The real values of the series were found by

[4]According to the World Bank data base, international tourism receipts (current US$) are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts include any other prepayment made for goods or services received in the destination country. They also may include receipts from same-day visitors, except when these are important enough to justify separate classification. For some countries they do not include receipts for passenger transport items. Data are in current US dollars.

[5] According to the World Bank data base, international tourism number of arrivals are international inbound tourists (overnight visitors) are the number of tourists who travel to a country other than that in which they have their usual residence, but outside their usual environment, for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited. When data on number of tourists are not available, the number of visitors, which includes tourists, same-day visitors, cruise passengers, and crew members, is shown instead. Sources and collection methods for arrivals differ across countries. In some cases, data are from border statistics (police, immigration, and the like) and supplemented by border surveys. In other cases, data are from tourism accommodation establishments. For some countries number of arrivals is limited to arrivals by air and for others to arrivals staying in hotels. Some countries include arrivals of nationals residing abroad while others do not. Caution should thus be used in comparing arrivals across countries. The data on inbound tourists refer to the number of arrivals, not to the number of people traveling. Thus a person who makes several trips to a country during a given period is counted each time as a new arrival.

deflating the nominal US dollar values using the US consumer price index. All variables are measured in logarithms.

Since the extracted sample data contains small number of observations (annual data from 1995 to 2014), we transform the annual time series data into quarterly frequencies by employing the quadratic match-sum method. This is done to better evaluate and examine the long run relationship between tourism receipts and oil prices, given that the short time span of the original time series won't help in testing the possible shift in the cointegration vector. Moreover, the quadratic match-sum method is not sensitive to outliers and breaks in the series, which goes in line with our analysis. Such approach has been adopted by many researchers in their empirical work in studying different long-run relations. For example: Romero (2005), Cheng *et al.* (2012), Hamdi *et al.* (2014), Shahbaz *et al.* (2017), and Shahbaz *et al.* (2018), among others.

Now, to examine the impacts of oil price shocks on tourism receipts in this paper, we postulate the long-run nexus between the variables as:

$$R_t = \alpha_0 + \alpha_1 P_t + \alpha_2 N_t + \varepsilon_t \quad (1)$$

where R_t is real tourism receipts, P_t is real oil price, N_t is tourism arrivals, and ε_t is the error term. It is clear that the data used in this paper is time series. Any time series variable can be stationary or nonstationary. A stationary variable is the one which has constant mean, variance and covariance over time. As such, any violation of these conditions donates a nonstationary variable. With nonstationary variables, running OLS is useless as the estimated regression is spurious. This issue introduced the cointegration analysis. Statistically, cointegration analysis is a proper method to explore the long-run relationship, and is useful in examining the validity of fundamental theories and parameters. As such, in this paper, we will analyze Eq. (1) using the cointegration analysis to empirically investigate the long run relationship between oil prices and tourism receipts.

Although there are different kinds of cointegration methods, this paper employs the Autoregressive Distributed Lag (ARDL) bounds approach, as it became lately the most popular method. The ARDL modeling approach was initially introduced by Pesaran and Shin (1999) and further extended by Pesaran *et al.* (2001). It is based on the estimation of a dynamic unrestricted error correction model (UECM) which holds many advantages over the other conventional cointegration techniques. First, the ARDL is an efficient estimator even if samples are small and some of the regressors are endogenous. Second, it provides simultaneously the short and long-run estimates of the model, which solves the autocorrelation and omitted variables concerns about the model. Third, it allows different optimal lags for involved variables, whether the dependents or independents, plus, the ARDL employs a single reduced form equation leading to a less loss in degrees of freedom. Fourth, ARDL cointegration technique is superior when dealing with variables that are integrated of different order, I(0), I(1) or combination of the both (variables should not be of order of I(2) because the test statistics are not valid). Finally, the standard F-statistics used in the bounds test (provided by Pesaran *et al.* (2001)) has a nonstandard distribution under the null hypothesis of no-cointegration relationship between the inspected variables.

Against this background, the ARDL representation of Eq. (1) for testing the long run relation between oil prices and tourism receipts, in a dynamic unrestricted error correction model, is written as:

$$\Delta R_t = \alpha + \beta_0 R_{t-1} + \beta_1 P_{t-1} + \beta_2 N_{t-1} + \sum_{i=1}^{m} \delta_{1i} \Delta R_{t-i} + \sum_{i=0}^{n} \Delta P_{t-1} + \sum_{i=1}^{q} \delta_{1i} \Delta N_{t-i} + u_t \quad (2)$$

where Δ is the difference operator, m, n, and q are the lags length, and u_t is serially uncorrelated error term. Pesaran and Shin (1999) note that the ARDL model does not require symmetry of lag lengths where each variable can have a different number of lag terms, unlike other types of cointegration tests.

The ARDL bounds test starts by estimating Eq. (2) using Ordinary Least Squares (OLS). Then, to test for existence of a long-run relationship among the variables, we conduct an F-test for the joint significance of the coefficients of the lagged level variables (R_{t-1}, P_{t-1}, N_{t-1}). The F-test examines the null hypothesis of no cointegration of tourism receipts and determinant variables, no long-run relationship; $H_0: \beta_0 = \beta_1 = \beta_2 = 0$, against the alternative hypothesis that there is cointegration among the variables; $H_1: \beta_0 \neq \beta_1 \neq \beta_2 \neq 0$. Pesaran *et al.* (2001) produced two sets of critical value bounds for the F-statistic (upper bound; I(1), and lower bound; I(0)) to construct the conclusion of whether there is evidence of cointegration or no. If the computed F-statistic of the model is bigger than the upper bound critical value; then there is support to reject the null hypothesis, implying that there is evidence of long-run cointegration relationship among the variables of the model. But if the computed F-statistic falls below the lower bound critical value, then there is no support to reject the null hypothesis of no-cointegration, meaning that we fail to find a long-run cointegration relationship among the variables of the model. Finally, the test is inconclusive if the computed F-statistic value falls within the bounds. However, due to the small sample size used in this paper, we will use the critical values for the bounds F-test (upper bound and lower bound) of Narayan (2005). Narayan shows that the critical values produced by Pesaran *et al.* (2001) are based on large sample sizes (sample sizes of 500 and 1000 observations and 20,000 and 40,000 replications respectively), and thus these critical values cannot be used for small sample sizes, which is the case in this paper. Lastly, from Eq. (1) and (2), the long-run coefficients ($\alpha_1 = -\frac{\beta_1}{\beta_0}$ and $\alpha_2 = -\frac{\beta_2}{\beta_0}$) will capture the long-run effect of oil prices and tourism arrivals, respectively, on tourism receipts, whereas, $\sum_{i=1}^{m} \delta_{1i}$ captures the short-run effect of oil prices on tourism receipts.

3. Empirical findings

3.1. Unit root test

Although the ARDL model can be employed despite if the involved variables are integrated of order one, I(1), zero, I(0), or a combination of both, however, the test statistics are not valid if any of the variables is integrated of order two, I(2). For this reason, we start by examining if any variable is integrated as I(2). This is done by adopting the conventional ADF unit root test, where the results are reported in Table (1). The findings confirm that none of the variables is integrated of order two, I(2). This means we can proceed to implement the ARDL test to examine the long-run nexus between oil price shocks and tourism receipts.

Table 1: ADF Unit Root Test of 2nd Difference

	R	P	N
Algeria	-4.278***	-4.278***	-5.003***
	(11)	(11)	(3)
Egypt	-5.076***	-4.278***	-4.162***
	(7)	(11)	(11)
Iran	-6.140***	-4.278***	-5.018***
	(11)	(11)	(11)
Israel	-4.764***	-4.278***	-3.820***
	(7)	(11)	(11)
Jordan	-3.614***	-4.278***	-3.646***
	(11)	(11)	(11)
Lebanon	-3.748***	-4.278***	-3.883***
	(11)	(11)	(11)
Morocco	-6.234***	-4.278***	-6.050***
	(7)	(11)	(7)
Oman	-7.905***	-4.278***	-6.013***
	(7)	(11)	(7)
Tunisia	-4.963***	-4.278***	-4.981***
	(7)	(11)	(11)
Turkey	-5.325***	-4.278***	-5.135***
	(11)	(11)	(11)

Notes: R *is* real tourism receipts, P is real oil price, N is tourism arrivals. The null hypothesis: series has a unit root. The test includes a constant without trend. The numbers in parentheses are the numbers of lags chosen by Akaike Information Criteria (AIC). A maximum of 11 lags are used. The critical value is: -3.533 at the 1% significance level. *** denotes rejection of the null hypothesis at the 1% significance level.

3.2. ARDL bounds test (cointegration)

As none of the variables is I(2), then, we proceed with the ARDL bounds test, to examine the long-run relationship between the variables by testing the significance of the lagged levels, as explained previously. We estimate Eq. (2) and check the F-statistic for each country. The findings are reported in Table (2).

The results do not show evidence of cointegration for all countries, except for Israel, where the computed F-statistic is whether noticeably below the lower bound critical value of 2.713 at the 10% significance level of by Narayan (2005), or it falls between the two F-critical values (lower bound and upper bound), indicating inconclusive decision. As for Israel, the F-statistics is significant at the 5% level; greater than the upper bound critical value at the 5%, supporting a long-run relationship between tourism receipts and oil prices in case of Israel.

Table 2: ARDL bounds cointegration test without structural breaks

Country	F-statistic	Conclusion	Selected Model
Algeria	1.725	No Cointegration	ARDL(2,0,0)
Egypt	1.636	No Cointegration	ARDL(2,0,2)
Iran	2.067	No Cointegration	ARDL(2,2,2)
Israel	4.415**	Cointegration	ARDL(3,2,4)
Jordan	3.302	Inconclusive	ARDL(2,2,2)
Lebanon	2.506	No Cointegration	ARDL(3,0,0)
Morocco	1.467	No Cointegration	ARDL(2,0,2)
Oman	3.025	Inconclusive	ARDL(2,2,0)
Tunisia	1.543	No Cointegration	ARDL(2,2,2)
Turkey	2.301	No Cointegration	ARDL(3,0,2)

Narayan (2005) Critical values (k = 2)		
Significance	I(0) Bound	I(1) Bound
10%	2.713	3.453
5%	3.235	4.053
1%	4.358	5.393

Notes: Null Hypothesis: No long-run relationship exist (no cointegration). The selection of the model (lags) is based on AIC. The bounds test critical values are from Narayan (2005) Critical values: Case II- restricted intercept and no trend. ** denotes significance at the 5% level.

3.3. ARDL bounds test (cointegration) with structural breaks

The findings of examining the long-run relationship between the tourism receipts and oil prices using the ARDL did not provide support for the cointegration test between the variables, which indicates no long-run equilibrium relationship. However, theoretically one would expect oil prices to affect tourism activities, and therefore, tourism receipts. As such, it is possible that the lack of support for the long-run could be due to the presence of structural breaks (changes) in the cointegrating vector between the variables in these countries.

According to Gregory *et al.* (1996), not finding support for long-run relationship (cointegration) might be due to ignoring the structural breaks in the cointegration test, when there is evidence for the presence of such breaks, because ignoring the breaks could lead to unstable long-run (cointegrating) relation, and this might cause deceptive results. That means, when there are structural breaks in the sample data then this may result in accepting the null hypothesis of no equilibrium relationship (no cointegration) when in fact there is. Hence, the paper tests if the sample data encounters structural breaks, especially that the time period (1995-2014) went through numerous remarkable events that could have caused shifts in the involved variables. Examples for such astonishing events are: the Asian financial crisis in 1997, the oil price crisis of 1998 where the prices fell to concerning levels to oil exporters, the September 11 attacks in 2001, the official use of the Euro as a common currency between 17 European nations in 2002, the war on Iraq in 2003, the devastating Tsunami in East Asia in 2004, the US subprime mortgage crisis in the years 2007 and 2008, the Arab Spring and falling of some regimes in the period 2011-2013, besides, many terrorists attacks around the World. Accordingly, it is considerably viable that these incidents could have triggered a shift in the long-run relationship between the variables, and, as such, it could be why we didn't find support for cointegration.

For this reason, and following Kisswani (2017) among others, we pay attention to the possibility of the presence of structural breaks in the sample data. This is done by employing Bai and Perron (1998) test for multiple structural breaks. Bai and Perron developed a methodology to test the presence of multiple structural breaks in the time series, and they show how to examine the statistical significance of these breaks. The test shows global optimization procedures for identifying *m-multiple* breaks which minimize the sums-of-squared residuals of the regression model. In this test, we allow for a maximum number of 5 breaks, employ a trimming percentage of 15%, and use the 5% significance level for the sequential testing.[6] If evidence of structural breaks is found, then we create dummy variables for the breaks and apply the ARDL test by including these breaks in the model. The dummy variable will be assigned for each break date found, and it assumes a value of 0 before the break date and a value of 1 for the break date and afterward. According to Pesaran *et al.* (2001), including the dummy variables (one-zero) in the model will not affect the inferences drawn about the cointegration among variables (Kisswani; 2017).

The findings of testing the multiple structural breaks, by applying the Bai and Perron test, are summarized in Table (3). The findings clearly show that the 10 countries experienced different number of breaks, and at different time periods. For Algeria, 5 significant breaks were found and are around: 1998: Q_1, 2001: Q_1, 2005: Q_1, 2008: Q_1, 2012: Q_1. For Egypt, 4 significant breaks were found and are around: 2000: Q_1, 2004: Q_1, 2008: Q_1, 2012: Q_1. For Iran, 4 significant breaks were found and are around: 1999: Q_1, 2004: Q_1, 2007: Q_1, 2010: Q_1. For Israel, 4 significant breaks were found and are around: 1999: Q_1, 2002: Q_2, 2006: Q_3, 2010: Q_1. For Jordan, 4 significant breaks were found and are around: 1998: Q_3, 2001: Q_3, 2006: Q_1, 2012: Q_1. For Lebanon, 2 significant breaks were found and are around: 1999: Q_1, 2002: Q_1. For Morocco, 5 significant breaks were found and are around: 1998: Q_1, 2001: Q_1, 2004: Q_1, 2007: Q_2, 2012: Q_1. For Oman, 5 significant breaks were found and are around: 1998: Q_1, 2001: Q_1, 2004: Q_1, 2007: Q_1, 2010: Q_1. For Tunisia, 5 significant breaks were found and are around: 1998: Q_1, 2002: Q_1, 2006: Q_1, 2009: Q_1, 2012: Q_1. Finally, for Turkey, 4 significant breaks were found and are around: 1998: Q_1, 2001: Q_1, 2007: Q_1, 2010: Q_1.

[6] For more details, see Bai and Perron (1998)

Table 3: Bai and Perron (1998) Structural Breaks Test

Country	Break Test	Scaled F-statistic	Critical Value [a]	Break Date
Algeria	0 vs. 1 *	578.30	13.98	1998: Q1, 2001: Q1,
	1 vs. 2 *	56.23	15.72	2005: Q1, 2008: Q1
	2 vs. 3 *	104.55	16.83	2012: Q1
	3 vs. 4 *	52.763	17.61	
	4 vs. 5 *	74.739	18.14	
Egypt	0 vs. 1 *	409.777	13.98	2000: Q1, 2004: Q1,
	1 vs. 2 *	138.526	15.72	2008: Q1, 2012: Q1
	2 vs. 3 *	134.780	16.83	
	3 vs. 4 *	96.204	17.61	
	4 vs. 5	0.00	18.14	
Iran	0 vs. 1 *	151.270	13.98	1999: Q1, 2004: Q1,
	1 vs. 2 *	153.810	15.72	2007: Q1, 2010: Q1
	2 vs. 3 *	92.327	16.83	
	3 vs. 4 *	39.497	17.61	
	4 vs. 5	0.00	18.14	
Israel	0 vs. 1 *	69.841	13.98	1999: Q1, 2002: Q2,
	1 vs. 2 *	853.861	15.72	2006: Q3, 2010: Q1
	2 vs. 3 *	194.360	16.83	
	3 vs. 4 *	79.367	17.61	
	4 vs. 5	0.00	18.14	
Jordan	0 vs. 1 *	569.693	13.98	1998: Q3, 2001: Q3,
	1 vs. 2 *	146.295	15.72	2006: Q1, 2012: Q1
	2 vs. 3 *	575.171	16.83	
	3 vs. 4 *	108.911	17.61	
	4 vs. 5	0.00	18.14	
Lebanon	0 vs. 1 *	628.110	13.98	1999: Q1, 2002: Q1,
	1 vs. 2 *	71.695	15.72	
	2 vs. 3	1.967	16.83	
Morocco	0 vs. 1 *	444.752	13.98	1998: Q1, 2001: Q1,
	1 vs. 2 *	328.178	15.72	2004: Q1, 2007: Q2
	2 vs. 3 *	59.883	16.83	2012: Q1
	3 vs. 4 *	95.393	17.61	
	4 vs. 5 *	43.568	18.14	
Oman	0 vs. 1 *	103.291	13.98	1998: Q1, 2001: Q1,
	1 vs. 2 *	112.497	15.72	2004: Q1, 2007: Q1
	2 vs. 3 *	89.463	16.83	2010: Q1
	3 vs. 4 *	80.910	17.61	
	4 vs. 5 *	19.950	18.14	
Tunisia	0 vs. 1 *	89.301	13.98	1998: Q1, 2002: Q1,
	1 vs. 2 *	906.760	15.72	2006: Q1, 2009: Q1
	2 vs. 3 *	77.00	16.83	2012: Q1
	3 vs. 4 *	65.497	17.61	
	4 vs. 5 *	50.719	18.14	
Turkey	0 vs. 1 *	417.247	13.98	1998: Q1, 2001: Q1,
	1 vs. 2 *	52.787	15.72	2007: Q1, 2010: Q1
	2 vs. 3 *	40.209	16.83	
	3 vs. 4 *	31.006	17.61	
	4 vs. 5	8.170	18.14	

Notes**:** [a] Bai-Perron (Econometrics Journal, 2003) critical values.* denotes significance at the 5% level.

Now, given that the outcomes of Table (3) give support for the structural breaks, we re-examine the long-run relationship between tourism receipts and oil prices via re-estimating Eq. (2) by including the structural breaks as part of the ARDL model (dummy variables: 0, 1), in the same way as it was explained previously. Table (4) reports the ARDL bounds cointegration test for each country; with the structural breaks, to re-investigate the cointegration relationship among the variables.

Table 4: ARDL bounds cointegration test with structural breaks

Country	F-statistic	Conclusion	Selected Model
Algeria	10.409***	Cointegration	ARDL(3,0,0)
Egypt	3.562*	Cointegration	ARDL(2,0,2)
Iran	3.155	Inconclusive	ARDL(2,2,2)
Israel	5.178**	Cointegration	ARDL(2,2,2)
Jordan	3.756*	Cointegration	ARDL(2,2,2)
Lebanon	25.181***	Cointegration	ARDL(3,0,0)
Morocco	1.643	No Cointegration	ARDL(2,0,2)
Oman	6.780***	Cointegration	ARDL(3,3,0)
Tunisia	3.125	Inconclusive	ARDL(2,2,2)
Turkey	16.694***	Cointegration	ARDL(4,0,3)

Narayan (2005) Critical values (k = 2)		
Significance	I(0) Bound	I(1) Bound
10%	2.713	3.453
5%	3.235	4.053
1%	4.358	5.393

Notes: Null Hypothesis: No long-run relationship exist (no cointegration). The selection of the model (lags) is based on AIC. The bounds test critical values are from Narayan (2005) Critical values: Case II- restricted intercept and no trend. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table (4) shows noticeably that incorporating the structural breaks have enhanced the cointegration findings when compared to the bounds test in the absence of the breaks. The findings from Table (4) support a long-run relationship among the variables with tourism receipts being the dependent variable, for more countries, where the null hypothesis of no cointegration can be rejected. The findings confirm cointegration relationship in case of Algeria (at the 1% level), Egypt (at the 10% level), Israel (at the 5%), Jordan (at the 10%), Lebanon (at the 1%), Oman (at the 1%), and Turkey (at the 1%). However, the findings did not support the cointegration relationship for Morocco only, likewise, the cointegration is inconclusive in case of Iran and Tunisia. The bounds test provide evidence of a long-run relationship between tourism receipts and oil prices after integrating structural breaks into the ARDL model for most countries. The outcomes of Table (4) reveal the importance of allowing for breaks when investigating the long-run relationship between tourism receipts and oil prices, taking into consideration the remarkable episodes over the sample span. To sum up, not including the structural breaks in the model could be the major reason for not finding evidence for cointegration previously, and this shows the importance of considering the breaks in the analysis as it could change or shift the long-run relationship among the variables when ignored.

3.4. Long-run & short-run effects of oil prices

After finding support for the cointegration relationship between tourism receipts and oil prices (besides tourism arrivals), we proceed to estimate and test the significance of the long- and short-run effects of oil prices, for the cases where cointegration is found.

Starting with the long-run effects, the findings, summarized in Table (5), suggest a significant effect of oil prices on tourism receipts for 4 countries only, namely: Algeria, Lebanon, Oman, and Turkey. However, this long-run effect is significantly positive for Algeria and Oman, but significantly negative for Lebanon and Turkey. In Algeria's case, a 1% increase in oil prices leads to a 0.56% increase in tourism receipts, which is significant at the 1% level. But in Oman's case, a 1% increase in oil prices leads to a 0.61% increase in tourism receipts, and it is significant at the 1% level. On the other hand, for Lebanon, a 1% increase in oil prices leads to a 0.15% decrease in tourism receipts, which is significant at the 5% level. Likewise, for Turkey, a 1% increase in oil prices leads to a 0.06% decrease in tourism receipts, and significant at the 1% level. Moreover, since the variables are measured in logarithms this implies that the long-run price effect represents the price elasticity effect on tourism receipts. As such, the price elasticities of tourism receipts are inelastic, where all are less than one (in absolute value).

In addition, Table (5) reports the error correction coefficient (ECM_{t-1}) that is derived from the estimated equilibrium relationship of Eq. (2). ECM_{t-1} measures the adjustment speed toward the long-run equilibrium that is how quickly or slowly variables go back to equilibrium after a short-run shock, and measures the speed of adjustment to reinstate equilibrium in the dynamic model. The estimated ECM_{t-1} needs to be significant and less than one in absolute value to confirm the long-run cointegration found. As shown from Table (5), the estimated ECM_{t-1} coefficients support the long-run relationship for all countries as required. Furthermore, it shows there is moderate adjustments to equilibrium in case of Algeria, Lebanon, and Turkey, but slow adjustments in case of Egypt, Israel, Jordan, and Oman.

Table 5: ARDL Long-Run Coefficients (Dependent variable is R) - With structural breaks

Country	P	N	ECM_{t-1}
Algeria	0.566***	-0.575	-0.412***
	(0.006)	(0.130)	(0.00)
Egypt	0.161	0.897***	-0.155***
	(0.205)	(0.00)	(0.00)
Israel	-0.015	0.558***	-0.166***
	(0.867)	(0.00)	(0.00)
Jordan	0.296	0.154	-0.079***
	(0.241)	(0.798)	(0.00)
Lebanon	-0.145**	0.449***	-0.435***
	(0.024)	(0.00)	(0.00)
Oman	0.606***	0.444**	-0.202***
	(0.00)	(0.025)	(0.00)
Turkey	-0.059***	1.058***	-0.501***
	(0.007)	(0.00)	(0.00)

Notes: R is real tourism receipts, P is real oil price, and N is tourism arrivals. All variables in logarithmic format. ECM_{t-1} is the error-correction coefficient. Numbers in parentheses represent p-value. *** and ** denote significance at 1% and 5% levels, respectively.

As for the short-run effects, we examine if at least one short-run coefficient is significant to give support for this short-run oil price effect. Table (6) describes the short-run dynamics for each country where cointegration is found. The findings reported show that oil prices have short-run effects on tourism receipts in case of Algeria, Israel, Jordan, and Oman. However, none of these short-run effects last into the long-run for Israel and Jordan, since the long-run effect is not significant. Nevertheless, in case of Algeria and Oman, the short-run effects last into the long-run as the long-run price coefficient is significant, as shown previously.

Table 6: ARDL Short-Run Coefficients (Dependent variable is ΔR) - With structural breaks

Country	ΔP	ΔP(-1)	ΔP(-2)
Algeria	0.307* (0.067)	-	-
Egypt	-0.025 (0.583)	-	-
Israel	0.170*** (0.001)	-0.156*** (0.002)	-
Jordan	0.318*** (0.00)	-0.104* (0.069)	-
Lebanon	-0.176 (0.139)	-	-
Oman	0.297*** (0.001)	-0.178** (0.034)	-0.156* (0.07)
Turkey	-0.038 (0.15)	-	-

Notes: P is real oil price. All variables in logarithmic format. Numbers in parentheses represent p-value. *** and ** denote significance at 1% and 5% levels, respectively.

3.5. Diagnostic tests of the ARDL model

Finally, to examine the robustness of the estimated ARDL model with structural breaks, we apply a number of diagnostic tests that investigate the stability and efficiency of the estimated coefficients. The diagnostic tests include the Lagrange Multiplier (LM) statistic (a measure of testing the serial correlation of the residuals, and has a χ^2distribution with two degrees of freedom), the Ramsey's RESET statistic (a measure of testing model specification, and follows χ^2 distribution with one degree of freedom), the CUSUM and CUSUMSQ tests of Brown *et al.* (1974) (measures the stability of the estimated short and long-run coefficients. The outcomes are reported as "S" for stable, "MS" for marginally stable, and "NS" for not stable), Jarque-Bera statistics for error normality (J-B), and the adjusted R^2 (shows the goodness of fit of the model). Table (7) summarizes the results for these diagnostic tests. The results show that coefficients are stable according to the CUSUM and CUSUMSQ results as at least one of the tests supports stability. The reported LM statistics support lack of autocorrelation for Egypt, Oman, and Turkey. Furthermore, the Ramsey's RESET statistics from Table (7) support model specification, where the null hypothesis; functional form of the model is correctly specified, can't be rejected. Finally, the size of the reported adjusted R^2 shows high goodness of fit of the model.

4. Concluding remarks

Previous research has suggested that higher oil prices generate an adverse effect on tourism (e.g., Becken and Lennox, 2012; Yeoman *et al.*, 2007). However, most of the studies were done for developed countries, where less attention was paid for developing countries, although many of the developing countries depend heavily on tourism revenues as important channel of their GDP. For this purpose, in this paper, we examined the effect of oil prices on tourism receipts for 10 randomly selected MENA destinations (Due to data availability) from 1995 to 2014, using the ARDL bounds cointegration test.

The empirical findings did not support the long-run relationship among the variables (cointegration), as the long-run effect was only documented in the case of Israel. However, this might have been due to ignoring the structural breaks in the cointegration test, when there is evidence for the presence of such breaks. For this reason, this paper re-estimated the long-run relationship between oil prices and tourist receipts by including the structural breaks, after finding support that the 10 countries experienced different number of breaks at different time periods. Apparently incorporating the structural breaks have enhanced the cointegration findings. The findings supported long-run relationship for more countries, when compared to the cointegration test in the absence of the breaks.

When testing the significance of the long-run effects of oil prices on tourism receipts, the empirical findings show evidence for only 4 countries of the sample data, namely: Algeria, Lebanon, Oman, and Turkey, indicating that the tourism receipts are price inelastic, where all estimates are less than one (in absolute value). As for the short-run dynamics, the findings offer support the oil prices short-run effects in case of Algeria, Israel, Jordan, and Oman. However, since the long-run effect is not significant for Israel and Jordan, this means none of these short-run effects last into the long-run for both countries.

Future research direction could be examining the effects of oil prices on tourism activities by adopting non-linear analysis, where the vast majority of the tourism literature have totally neglected the importance of the non-linearity. Non-linear analysis could be important since the response of tourism activities to positive change in oil prices (increase) could be different from the response to the negative change (decrease). Therefore, we recommend that future studies to consider including such important issue. Indeed, this is our plan for future work.

References

Bai, J., Perron, P. (1998). Estimating and Testing Linear Models with Multiple Structural Changes. *Econometrica. 66*: 47–78.

Bai, J., Perron, P. (2003). Critical values for multiple structural change tests. *Econometrics Journal. 6*: 72–78.

Becken, S. (2008). Developing indicators for managing tourism in the face of peak oil. *Tourism Management*. 29: 695-705.

Becken, S. (2011). Oil, the global economy and tourism. *Tourism Review*, *66,* 65 –72.

Becken, S., Lennox, J. (2012). Implications of a long-term increase in oil prices for tourism. *Tourism Management*. 33(1): 133–142.

Becken, S., Nguyen, M., and Schiff, A. (2009), 'Impacts of oil prices on New Zealand tourism: a framework', Lincoln University, Lincoln.

Becken, S., Schiff, A. (2010). Distance models for New Zealand international tourists and the role of transport prices. *Journal of Travel Research*. 50(3): 303–320

Brown, R. L., Durbin, J., Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society. 37*: 149-192.

Cheng, M., Chung, L., Tam, C-S., Yuen, R., Chan, S., Yu, I-W. (2012). Tracking the Hong Kong Economy. Occasional Paper 03/2012. Hong Kong Monetary Authority.

Dogrul, H. G., Soytas, U. (2010). Relationship between oil prices, interest rate, and unemployment: Evidence from an emerging market. *Energy Economics*. 32(6): 1523–1528.

Gregory, A. W., Nason, J. M., Watt, D. G. (1996). Testing for structural breaks in cointegrated relationships*. Journal of Econometrics. 71*: 321–341.

Hamdi, H., Sbia, R., Shahbaz, M. (2014). The nexus between electricity consumption and economic growth in Bahrain. *Economic Modelling. 38*: 227–237

Katircioglu, S. T., Sertoglu, K., Candemir, M., Mercan, M. (2015). Oil price movements and macroeconomic performance: Evidence from twenty-six OECD countries. *Renewable and Sustainable Energy Reviews.* 44: 257–270.

Kisswani, K. (2017). Evaluating the GDP-Energy Consumption Nexus for the ASEAN-5 Countries using Nonlinear ARDL Model. *OPEC Energy Review. 41(4)*: 318-343.

Meo, M., Chowdhury, M., Shaikh, G., Ali, M., Masood Sheikh, S. (2018). Asymmetric impact of oil prices, exchange rate, and inflation on tourism demand in Pakistan: new evidence from nonlinear ARDL. *Asia Pacific Journal of Tourism Research*. 23(4): 408-422.

Naccache, T. (2010). Slow oil shocks and the weakening of the oil price–macroeconomy relationship. *Energy Policy*. 38(5): 2340–2345.

Narayan. P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. *Applied Economics. 37* (17): 1979-1990

Pesaran, M.H., Shin, Y. (1999). "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis." Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, Strom, S. (ed.) Cambridge University Press.

Pesaran, M.H., Shin, Y., Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics. 16*: 289–326.

Romero, A.M., 2005. Comparative study: factors that affect foreign currency reserves in China and India. Honors Projects, Economics Department, Illinois Wesleyan University. United States.

Shahbaz, M., Ferrer, R., Shahzad, S., Haouas, I. (2018). Is the tourism–economic growth nexus time varying? Bootstrap rolling-window causality analysis for the top 10 tourist destinations. *Applied Economics*. *50(24)*: Pages 2677-2697

Shahbaz, M., Van Hoang, T., Mahalik, M., Roubaud, D. (2017). Energy consumption, financial development and economic growth in India: New evidence from a nonlinear and asymmetric analysis. *Energy Economics. 63*: 199–212

Small, J., Sweetman, C. (2009). *New Zealand Tourist Arrivals*. Covec Research Report. Prepared for Foundation for Research, Science & Technology. Auckland. New Zealand. Available at:http://www.lincoln.ac.nz/Research-Centres/LEaP/Climate-Change-Peak-Oil--Society/Projects/Tourism--Oil/

UNWTO (2010): Annual report 2014. Retrieved from http://www2.unwto.org/annualreport2010 on May 10, 2011.

Yeoman, I., Lennon, J.J., Blake, A. (2006). *When the Oil Runs Out: What Does This Mean for Scottish Tourism?* Visit Scotland, Edinburgh.

Yeoman, I., Lennon, J., Blake, A., Galt, M., Greenwood, C., McMahon-Beattie, U. (2007). Oil depletion: What does this mean for Scottish tourism? *Tourism Management*, 28, 1354-1365.

Table 7: Diagnostics tests

Country	LM (2)	RESET test	J-B	CUSUM	CUSUMSQ	Adj. R^2
Algeria	11.56***	1.32	42.6***	NS	S	0.985
	(0.003)	(0.19)	(0.00)			
Egypt	2.47	0.85	57.57***	S	S	0.994
	(0.29)	(0.40)	(0.00)			
Israel	6.55**	0.80	203.6***	S	MS	0.995
	(0.038)	(0.43)	(0.00)			
Jordan	7.54**	0.41	31.84***	MS	NS	0.998
	(0.023)	(0.68)	(0.00)			
Lebanon	18.08***	1.39	55.63***	S	MS	0.993
	(0.00)	(0.17)	(0.00)			
Oman	2.15	1.11	329.12***	S	S	0.995
	(0.34)	(0.27)	(0.00)			
Turkey	3.86	1.29	1.90	MS	MS	0.999
	(015)	(0.20)	(0.39)			

Notes: LM (2) is the LM statistics for autocorrelation up to order 2. RESET test is Ramsey's test (null hypothesis: functional form is correctly specified). CUSUM is the cumulative sum of recursive residuals (S: stable, MS: marginally stable, NS: not stable). CUSUMSQ is the cumulative sum of squares of recursive residuals (S: stable, MS: marginally stable, NS: not stable). Numbers in parentheses represent p-value.