Turan, Taner; Karakas, Mesut; Ozer, Huseyin Alperen

Article

How do oil price changes affect the current account balance? : evidence from co-integration and causality tests

Ekonomický časopis

Provided in Cooperation with:
Slovak Academy of Sciences, Bratislava

Reference: Turan, Taner/Karakas, Mesut et. al. (2020). How do oil price changes affect the current account balance? : evidence from co-integration and causality tests. In: Ekonomický časopis 68 (1), S. 55 - 68. https://www.sav.sk/journals/uploads/0224112001%2020%20Turan%20et%20al.%20+%20SR.pdf.

How Do Oil Price Changes Affect the Current Account Balance? Evidence from Co-integration and Causality Tests

*Taner TURAN – Mesut KARAKAS – Huseyin Alperen OZER**

Abstract

This paper examines the relationship between the global oil prices and current account balances in Czechia, Hungary, and Poland by using ARDL and causality analysis. Our estimates indicate that there is a co-integrating relationship among the global oil price, current account balance, GDP growth rate, and real exchange rate in the sample countries. We find that a change in oil price has a significant effect on the current account balance in Poland and Czechia. Additionally, our results suggest that a change in the growth rate exerts a significant effect on the current account in these two countries. Moreover, there is a causal relationship running from the oil prices to current account balances in all sample countries in the short run. Furthermore, it seems that the growth rates Granger cause the current account in Czechia and Hungary in the short run. Finally, we also detect a long run and strong causality between variables in some cases.

Keywords: *current accounts, oil prices, causality, VECM, ARDL*

JEL Classification: F32, F31, Q41

Introduction

The first and second oil crises strongly proved the importance of oil price changes on macroeconomic activity and variables. Since then, several works pay a close attention to the relationship between the oil prices and macroeconomic dynamics, including the productivity, growth, inflation, trade, and external balances (Mork, Olsen and Mysen, 1994; Hamilton, 1983; 2005; Gruber and Kamin, 2007; Rafiq, Sgro and Apergis, 2016).

Intertemporal models clearly show that a current account deficit is not necessarily bad for an economy (see, Obstfeld and Rogoff, 1996). It would be even optimal for giving current account deficits in some periods rather than constantly

* Taner TURAN, corresponding author – Mesut KARAKAS – Huseyin Alperen OZER, Gebze Technical University, Department of Economics, 41400 Kocaeli, Turkey; e-mail: tturan@gtu.edu.tr; mesutkarakas@gmail.com; aozer@gtu.edu.tr

keeping current account in balance. However, this does not mean that excessive current account imbalances are always harmless or desirable. It is a well-known fact that high current account imbalances would create a risk for not only individual countries but also the global economy. For example, the famous global saving glut hypothesis of Bernanke (2005) implies that the imbalances in current account are one of the underlying causes of last global crisis. A jump in the current account surplus in some countries, including certain major oil exporters, leads to low interest rates and expansion of subprime mortgage loans in the US, where the global crisis started.

There would be a close relation between the oil price and current account balance in oil exporting and importing countries. It is clear that a change in oil prices would result in equal or proportional increase in the export (import) earnings (receipts) in oil exporting (importing) countries. Therefore, a price increase would end up improving (worsening) the current account in the exporting (importing) countries. For example, before the last global crisis, some oil exporting countries enjoyed a considerable current account surplus due to rising oil prices.

In this study, we contribute to the existing literature by examining the effects of oil prices on the current account balances in three emerging European countries, namely Czechia, Hungary, and Poland. In addition to being Central and Eastern European countries, these economies have many things in common such as giving a current account deficit in the past and importing oil. We think that it is important for policy formulation to establish whether there exists a link between the global oil prices and current account deficits. If the global oil prices are among the determinants and causes of current account balance, then policy makers in these countries should develop some policies based on this fact. In this context, for example they would implement policy measures related to the types or intensity of energy used in the production process. We use both Autoregressive Distributed Lag (ARDL) and Vector Error Correction Model (VECM). ARDL approach, developed by Pesaran, Shin and Smith (2001), has some major advantages compared to the other conventional co-integration techniques. For instance, we can carry out ARDL approach to the co-integration whether our series are integrated in I(0) or I(1). This methodology also enables us to distinguish between the short and long term effects. Therefore, ARDL is suitable to investigate the impacts of oil prices on the current accounts. We find that there is a co-integrating relationship between oil prices, current account balances, GDP growth rates, and reel exchange rates in sample countries. Our results suggest that there is a relationship between the oil prices and current account balances in cases of Czechia and Poland. To disentangle the causal relationships among variables in more detail, we employ a VECM framework and show that short run

and strong causal effects running from the oil prices to the current account in all countries, while the long run causality is valid only for Czechia and Poland.

This study is structured as follows: We review the literature in section 1, present an overview of the oil prices and current account balances in sample countries in section 2, explain the model and data in section 3, discuss the empirical results in section 4, and finally summarize our findings in the last section.

1. Literature Review

Since the oil is closely related to the production process, it has crucial effects on output and external imbalances. Following the major shocks in early and late 1970s, in an influential study Hamilton (1983) examines the effects of oil prices on the US output. He documents that every US recession between 1949 and 1973 preceded by the increase of crude oil price with a lag around three or four years. In his following works, Hamilton (1996) upholds his arguments that there is a significant correlation between oil prices, output, and recessions. Afterwards, some researchers have extended the Hamilton's arguments by linking the oil price surges with output (Burbidge and Harrison, 1984; Gisser and Goodwin, 1986; Mork, 1989; Lardic and Mignon, 2006). However, there are several unexpected declines in oil prices that occurred in 1986, 1998 and after the 2008 crisis. The effects of oil price declines on output are discussed by Kilian and Vigfusson (2011) and Cunado and De Gracia (2005).

Although, there is an ongoing debate on the relationship between the oil prices and output, some studies try to clarify the link between the trade balances and oil prices. Backus and Crucini (2000), and Bodenstein, Erceg and Guerrieri (2011) find that the dramatic changes of oil prices play a prominent role for the trade balances in oil importing countries with DSGE approach. In this vein, Kilian (2009) for US, and Le and Chang (2013) for Malaysia, Japan and Singapore provide some empirical evidence for oil price-trade nexus.

More related to our context, Agmon and Laffer (1978), Bruno and Sachs (1982), and Gavin (1990) are among the early studies investigating the direct impact of oil prices on the current account dynamics. Since then, a large number of studies empirically examine the relationship between the current accounts and oil prices. In this strand, some studies such as Zaouali (2007) for China, Chuku et al. (2009) for Nigeria, Ozlale and Pekkurnaz (2010) for Turkey, and Huntington (2015) for 91 countries provide somewhat mixed evidence on the relationship between the oil price and current accounts in oil importing countries. Moreover, some researchers, like Gnimassoun, Joets and Razafindrabe (2017) for Canada and Allegret et al. (2014) for 27 countries, report a significant association between

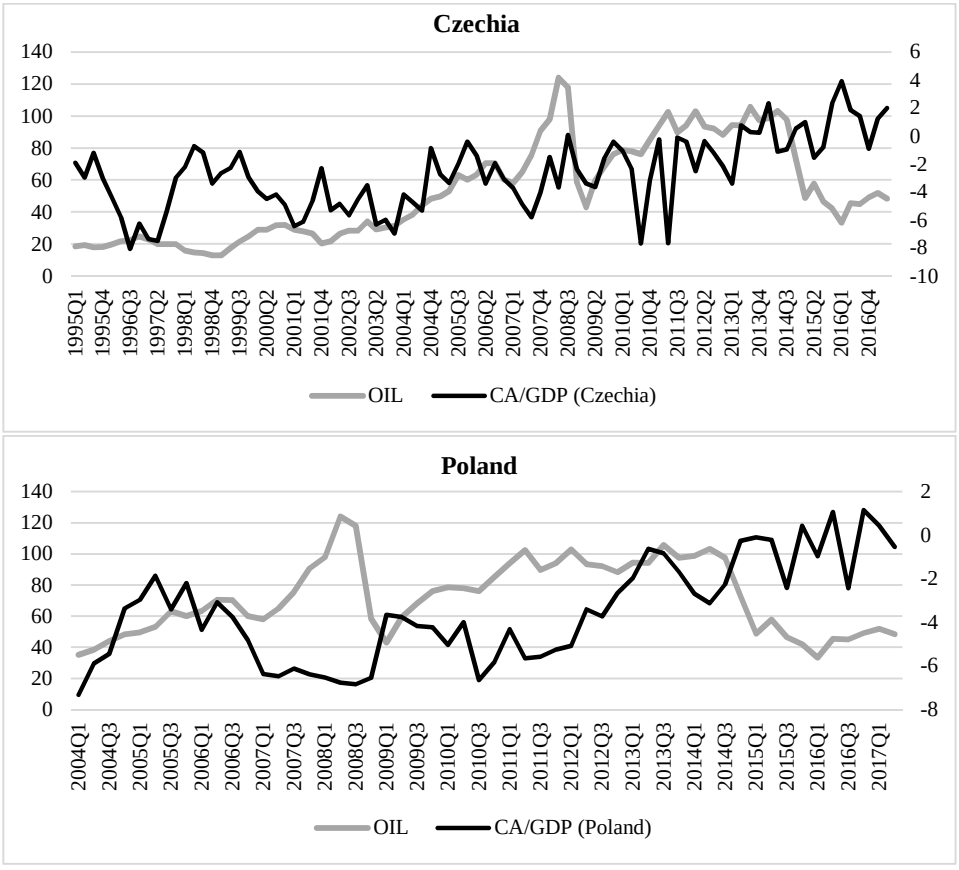
the current accounts and oil prices in oil exporting countries. From the theoretical perspective, Kilian (2009) provides a detailed identification for the transmission channel from oil price shocks to the current account dynamics. These channels are: (I) supply-side channel; (II) demand-side channel; (III) monetary policy channel; (IV) trade channel and valuation channel.

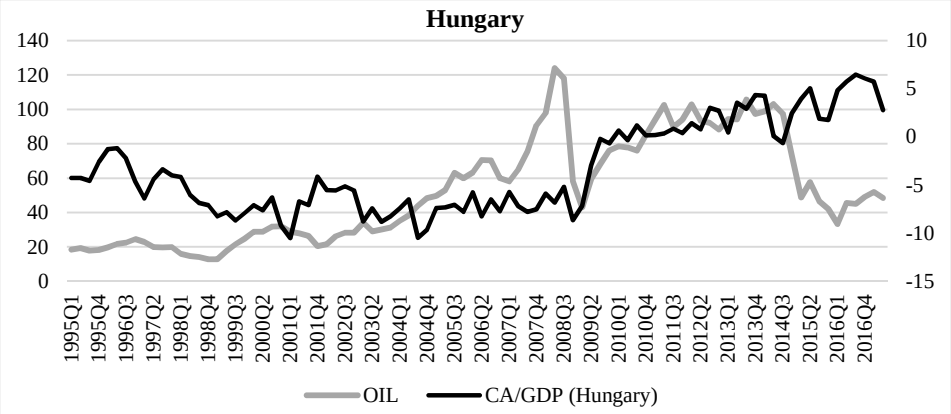
2. An Overview of the Oil Prices and Current Account Balances in Sample Countries

Before explaining the empirical methodology, we present a short overview of the oil prices and current account balances in Czechia, Poland, and Hungary. The right side represents the current account balance (as a percentage of GDP) while the left side represents WTI oil price (US Dollars per barrel, constant prices in 2017) in Figure 1.

F i g u r e 1

CA/GDP – Oil Price Relationship





Source: BP Statistical Review of World Energy and St. Louis FRED database.

We observe that the oil prices constantly increase over the 1998Q1 – 2008Q4 period. In Hungary, we see a close association between the oil price and current account balance in a period after 2009, suggesting a rise in the oil price with an improvement in the current account. After 2014, there is a decline (increase) in the oil price (the current account balance). At the start of crisis (2008Q1), rising oil prices have distorting effects on the current account balances in Poland but we observe that the relationship between the oil prices and current account is not conclusive as it is for Hungary in the following periods. As for Czechia, the current account balance significantly improves after 2013 with a decline in the oil prices.

3. Dataset and Methodology

This study mainly examines the impact of the oil prices (OIL) on the current account balances (CA/GDP) in three emerging European countries, namely Hungary, Poland, and Czechia. We also include economic growth (GDPGR) and real exchange rate (RER) in our models. We take CA/ GDP and GDPGR series from OECD, and OIL and RER from BP Statistical Review of World Energy and St. Louis FRED database, respectively. Due to the unavailability of data, sample period is restricted to 1996Q1 – 2018Q1 for Hungary, 2004Q1 – 2017Q2 for Poland, and 1995Q1 – 2017Q2 for Czechia.

In our analysis, we conduct ARDL co-integration test to determine whether there exists a long-run relationship among the chosen variables. This test has some superiority over the classical co-integration tests such as Engle and Granger (1987), Johansen (1991), Banerjee, Dolado and Mestre (1998). First, ARDL can be applied regardless of whether the series are I(1) or I(0). Second, ARDL allows that the series have different optimal lags while it is not possible with conventional co-integration tests. Finally, ARDL produces a single reduced form equation,

while other techniques estimate a system of equations. For the ARDL approach, the conditional error correction model can be written as follows:

$$\Delta CA/GDP_t = \beta_0 + \beta_1 CA/GDP_{t-1} + \beta_2 OIL_{t-1} + \beta_3 GDPGR_{t-1} + \beta_4 RER_{t-1} + \sum_{i=1}^{I}\beta_i \Delta CA/GDP_{t-i} + \sum_{i=0}^{I}\beta_i \Delta OP_{t-i} + \sum_{i=0}^{I}\beta_i \Delta GDPGR_{t-i} + \sum_{i=0}^{I}\beta_i \Delta RER_{t-i} + \varepsilon_t \quad (1)$$

In ARDL model while determining the optimal lag length, it is a crucial issue to make sure that there is no autocorrelation. According to Pesaran, Shin and Smith (2001), the existence of co-integrating relationship is tested by means of F test. If null hypothesis, $H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ is rejected, we can conclude that a co-integrating relationship exists between variables. The estimated F statistics must be compared to the upper and lower bounds provided by Pesaran, Shin and Smith (2001). If a co-integration is found then the short run and long run coefficients are analyzed. Having examined the co-integration issue, the next step is to determine the long run and short run causality between OIL, GDPGR, RER and CA/GDP in more detail. The conventional Granger's causality suggests that past values of variables of interest can cause future values but the reverse is not correct. For causality analysis, we estimate a VEC model (i.e. with the variables in first differences) and include the long run relationships as the error correction term. The following dynamic VEC model is estimated to test the long and short run causal effects between the variables.

$$\Delta Y_t = a_i + \sum_{i=1}^{k}\varphi_i \Delta Y_{t-i} + \sum_{j=1}^{k}\beta_j \Delta X_{t-j} + \varphi_1 ECT_{t-1} + e_t \quad (2)$$

e_t represents the residual term which contains zero mean and homoscedastic variance. The lag length of model (2) is based on Schwarz Information Criteria. Using the model (2) the Granger causality can be tested in three different ways (for example, see Ozturk and Acaravci, 2010; Oh and Lee, 2004). First, short run (or weak) causal effects can be detected by testing $H_0; \beta_j = 0$. Second, the coefficient on ECT is another source of causal effects. This represents the long run causality which can be tested by $H_0;\ \varphi_1 = 0$. Third, strong Granger causalities are detected by $H_0; \beta_j = \varphi_1 = 0$.

4. Empirical Results

4.1. Unit Root Tests

We should first check the stationary properties of the series. Thus, we employ Augmented Dickey Fuller (ADF) unit root test to ensure that none of the series integrated in I(2).

Table 2 shows the ADF test results. It seems that all series have appropriate integration of order for ARDL test.[1]

4.2. ARDL Results

In this section, we present the results of ARDL estimations for sample countries in Table 2. We use Schwarz Information Criteria (SIC) to choose the optimal lag length. We also check the parameter stability by means of CUSUM and CUSUMSQ tests. If the parameters are unstable over the period, we use some dummy variables to correct the structural breaks in ARDL model. We also check autocorrelation, heteroscedasticity, and functional misspecification via LM, ARCH and Ramsey RESET tests, respectively.

F tests suggest that there is a co-integrating relationship between the oil price and independent variables in all countries. In short run, there is a negative relationship between the oil prices and current account balance in Czechia. In other words, an increase (decrease) in oil prices leads to a worsening (improvement) in the current account balance, consistent with expectations. It seems that GDP growth has a positive effect on the current account in the short run. However, these results are not transmitted into the long run.

In Hungarian case, there is no significant relationship between the oil prices and current account balance while real exchange rate negatively affects the balance in the long run. Our empirical results indicate that the coefficient on the oil price is negative and statistically significant both in the long run and short run for Poland. Since Poland imports a significant fraction of its oil needs, this result is not surprising.

The coefficient on the oil price implies that a one-unit increase in oil price is associated with 0.016 unit decrease in the current account balance in Poland. We should also note that GDP growth rates have a negative effect on current account in the long run in Poland. This suggests that an increase (decrease) in the growth rates is associated with a decrease (increase) in the current account balance. In a sense, this might reflect a fundamental or structural problem in the current account dynamics in Poland. There is no doubt that as an emerging economy Poland aims and needs to sustain high growth rates. However, high growth rates should not lead to ever-increasing current account deficits. Finally, Panel B in Table 2 suggests that there are no serial correlation, heteroscedasticity, and parameter instability problems in our estimations.

[1] In addition to ADF tests, we also carry out KPSS *(Kwatowski-Phillips-Schimit-Shin)* tests and find that it is possible to use ARDL approach. We do not report the results of KPSS tests here but they are available from the authors.

Table 1

ADF Tests

Variables	***CA/GDP***		***OIL***		***GDPGR***		***RER***	
Countries	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**
Czechia	–2.027	–5.882***	–1.697	–2.541	–3.061**	–2.984	–2.114	–1.784
Hungary	–2.180	–5.981***	–1.672	–2.473	–1.312	–1.273	–2.085	–1.343
Poland	–1.408	–3.162	–2.826*	–2.711	–3.132**	–3.184*	–3.939**	–4.354***
Variable	**Δ*CA/GDP***		**Δ*OIL***		**Δ*GDPGR***		**Δ*RER***	
Countries	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**	**Only Int.**	**Int.&Trend**
Czechia	–10.531***	–10.539***	–7.726***	–7.755***	–6.000***	–6.063***	–6.707***	–6.876***
Hungary	–10.905***	–10.836***	–7.538***	–7.565***	–5.094***	–5.058***	–7.492***	–7.822***
Poland	–10.972***	–10.864***	–5.945***	–6.090***	–4.597***	–4.805***	–6.005***	–5.987***

Note: ***, ** and * refers to 1%, 5% and 10% significance level, respectively.

Source: Authors' estimations.

Table 2

ARDL Results

Panel A: Estimates					
Czechia		**Hungary**		**Poland**	
Short Run Coef.		***Short Run Coef.***		***Short Run Coef.***	
Constant	–3.074	*Constant*	0.478	*Constant*	2.600
ΔOIL	–0.040*	*ΔOIL*	–0.029	*ΔOIL*	–0.016***
ΔGDPGR	0.368*	*ΔGDPGR*	0.252	*ΔGDPGR*	–0.036
ΔRER	0.063	*ΔRER*	–0.039	*ΔRER*	–0.237
Long Run Coef.		***Long Run Coef.***		***Long Run Coef.***	
CA/GDP	–0.549***	*CA/GDP*	–0.537***	*CA/GDP*	–0.696***
OIL	0.001	*OIL*	0.003	*OIL*	–0.016*
GDPGR	0.021	*GDPGR*	0.091	*GDPGR*	–0.237*
RER	0.010	*RER*	–0.041*	*RER*	–0.036
Panel B: Diagnostics					
F_{PSS}	8.201***	7.291***		7.967***	
CUSUM	Stable	Stable		Stable	
CUSUMSQ	Stable	Stable		Stable	
R^2	0.305	0.292		0.474	
$adjR^2$	0.235	0.224		0.379	
LM Test Prob.	[0.932]	[0.150]		[0.151]	
ARCH Test Prob.	[0.438]	[0.280]		[0.454]	
Reset Test Prob.	[0.041]	[0.295]		[0.898]	

Notes: Coef. is an abbreviation for coefficient. ***, **, and * indicate the significance at 1%, 5% and 10% levels, respectively. Numbers in square brackets are p-values.

Source: Authors' estimations.

4.3. Causality Results

Granger (1969) suggests that if there is a long run relationship between variables, there must be a causal relationship in at least one direction. We report Granger causality tests based on VEC model (2) in Table 3.[2]

We find a causal relationship running from the oil prices to the current account in the short run in sample countries. Moreover, we detect a long run causality from ECT to current account in Czechia and Poland. Finally, there exists a strong causality from the oil prices and error correction term to the current account balance in all countries. This result suggests that the global oil price fluctuations Granger cause the current account balances in the short and long run in these countries. These results are in line with that of Le and Chang (2013) for Japanese case.

Although our main interest is to uncover the relationship between oil prices and current account, we summarize other causal relationships reported in Table 3. In Czechia, there is a causal relationship running from ΔGDPGR to ΔCA/GDP in the short run, consistent with our ARDL results. On the other hand, a bi-directional causality is found between ΔGDPGR and ΔCA/GDP for Hungary in both weak and strong cases.

A notable result is that there is a one-way causality from ΔRER to ΔGDPGR in short run case for Czechia and Hungary. The one-way causal relationship from ΔRER to ΔGDPGR might be supporting the arguments put forward by Rodrik (2008) and Eichengreen (2007). On the other hand, there is a one-way weak and strong causality from ΔGDPGR to ΔRER in Poland. Interestingly, Habib, Bützer and Stracca (2016) explain the reverse causal mechanism between ΔGDPGR and ΔRER.

Another interesting result is that there is a one-way causal relationship running from ΔOIL to ΔGDPGR only in Czechia in the short run. This result is consistent with that of Du, Yanan and Wei (2010) for China, Troster, Shahbaz and Uddin (2018) for United States, and Papapetrou (2001) for Greece. In addition, this effect is transmitted into the strong causal relationship running from ΔOIL to ΔGDPGR in all sample countries. Lastly, the one-way relationship from ΔOIL to ΔRER is found for Czechia, Hungary, and Poland. This result is also confirmed by Sari, Hammoudeh and Soytas (2010) for USA and Rautava (2004) for Russian Federation.

[2] We do not report the results of causality analysis running from current account to global oil prices, as it is unrealistic to expect that current account balances in our sample countries have a strong effect on global oil prices. These results, nevertheless, are available from authors on request.

Table 3

Causality Tests

Czechia		Hungary		Poland	
Null Hypotheses	**F – Statistics**	**Null Hypotheses**	**F – Statistics**	**Null Hypotheses**	**F – Statistics**
Short Run (or Weak Causality)		***Short Run (or Weak Causality)***		***Short Run (or Weak Causality)***	
ΔGDPGR –> ΔCA/GDP	9.901*	*ΔGDPGR –> ΔCA/GDP*	20.685***	*ΔGDPGR –> ΔCA/GDP*	1.417
ΔRER –> ΔCA/GDP	4.857	*ΔRER –> ΔCA/GDP*	9.884	*ΔRER –> ΔCA/GDP*	0.115
ΔOIL –> ΔCA/GDP	12.028**	*ΔOIL –> ΔCA/GDP*	15.532***	*ΔOIL –> ΔCA/GDP*	4.711*
ΔCA/GDP –> ΔGDPGR	5.635	*ΔCA/GDP –> ΔGDPGR*	22.629***	*ΔCA/GDP –> ΔGDPGR*	1.547
ΔRER –> ΔGDPGR	11.278**	*ΔRER –> ΔGDPGR*	11.115*	*ΔRER –> ΔGDPGR*	1.153
ΔOIL –> ΔGDPGR	19.282***	*ΔOIL –> ΔGDPGR*	6.053	*ΔOIL –> ΔGDPGR*	0.222
ΔCA/GDP –> ΔRER	2.584	*ΔCA/GDP –> ΔRER*	4.757	*ΔCA/GDP –> ΔRER*	2.92
ΔGDPGR –> ΔRER	2.165	*ΔGDPGR –> ΔRER*	3.428	*ΔGDPGR –> ΔRER*	7.821**
ΔOIL –> ΔRER	16.991***	*ΔOIL –> ΔRER*	12.358*	*ΔOIL –> ΔRER*	12.300***
Long Run Causality		***Long Run Causality***		***Long Run Causality***	
ECT –> ΔCA/GDP	5.546***	*ECT –> ΔCA/GDP*	2.501	*ECT –> ΔCA/GDP*	4.754**
ECT –> ΔGDPGR	6.191***	*ECT –> ΔGDPGR*	2.582	*ECT –> ΔGDPGR*	0.391
ECT –> ΔRER	1.941	*ECT –> ΔRER*	1.549	*ECT –> ΔRER*	3.798*
Strong Causality		***Strong Causality***		***Strong Causality***	
ΔGDPGR, ECT –> ΔCA/GDP	17.209***	*ΔGDPGR, ECT –> ΔCA/GDP*	27.167***	*ΔGDPGR, ECT –> ΔCA/GDP*	8.485**
ΔRER, ECT –> ΔCA/GDP	9.801	*ΔRER, ECT –> ΔCA/GDP*	16.990*	*ΔRER, ECT –> ΔCA/GDP*	6.475*
ΔOIL, ECT –> ΔCA/GDP	16.364***	*ΔOIL, ECT –> ΔCA/GDP*	16.576**	*ΔOIL, ECT –> ΔCA/GDP*	9.420**
ΔCA/GDP, ECT –> ΔGDPGR	11.078***	*ΔCA/GDP, ECT –> ΔGDPGR*	22.877***	*ΔCA/GDP, ECT –> ΔGDPGR*	2.102
ΔRER, ECT –> ΔGDPGR	15.758***	*ΔRER, ECT –> ΔGDPGR*	12.453*	*ΔRER, ECT –> ΔGDPGR*	2.023
ΔOIL, ECT –> ΔGDPGR	27.247***	*ΔOIL, ECT –> ΔGDPGR*	15.507***	*ΔOIL, ECT –> ΔGDPGR*	0.615
ΔCA/GDP, ECT –> ΔRER	3.191	*ΔCA/GDP, ECT –> ΔRER*	5.99	*ΔCA/GDP, ECT –> ΔRER*	5.612
ΔGDPGR, ECT –> ΔRER	3.751	*ΔGDPGR, ECT –> ΔRER*	5.25	*ΔGDPGR, ECT –> ΔRER*	9.373**
ΔOIL, ECT –> ΔRER	17.275***	*ΔOIL, ECT –> ΔRER*	12.739*	*ΔOIL, ECT –> ΔRER*	16.153***

Notes: Number of the optimal lags are five for Czechia, six for Hungary, and two for Poland. The optimal lag lengths of VEC models are chosen by Schwarz Information Criteria. *,** and *** refers to 10 %, 5 % and 1 % significance level, respectively.
Source: Authors' estimations.

Conclusion

In this study, we investigate the relationship between the oil prices and current account balances by applying ARDL and causality analysis for Czechia, Hungary, and Poland.

When the global oil price is the dependent variable, we find a co-integrating relationship for all countries. ARDL results indicate that changes in the oil prices have a significant negative effect on current account balance in the long run and short run in Poland and only in the short run in Czechia. Additionally, we find that a change in the growth rate has a significant negative (positive) effect on the current account in the long (short) run in Poland (Czechia), implying an increase in the growth rate is associated with deterioration (improvement) in the current account balance.

To reveal the causal relationships in detail, we utilize Vector Error Correction Model. We detect a causal relationship running from the global oil price to the current account balance in all sample countries in the short run. Also, we find a long run causality for Czechia and Poland and strong causality in all three countries. Another notable result is that the global oil prices have one-way causal effects on economic growth in Czechia.

When we consider the current account-economic growth relationship, we conclude that the causal relationship in Hungary is bi-directional while we report a one-way causality running from the economic growth to the current account balance in Czechia. Moreover, there exists a strong causality between the growth rates and current accounts in three countries. The causality analysis confirms a unidirectional causal relationship running from the real exchange rate to the economic growth in Czechia and Hungary.

Finally, we think it is worth mentioning and highlighting some important points. First, our findings clearly show that it would be important to incorporate the long run and short run effects.

Second, to alleviate the impact of changes in the oil prices on the current account, implementing some policies such as encouraging alternative and renewable energy sources, and domestic savings should be seriously considered in the sample countries.

Third, policy makers in Poland should pay more attention to the negative relationship between the growth rate and the current account balance. This situation would be reflecting a fundamental problem in the economic dynamics and hence indicating a need for a change in the economic policy priorities. In other words, it is important to cut or, at least, weaken the negative link between the growth rates and the current account balance.

References

AGMON, T. – LAFFER, A. B. (1978): Trade, Payments and Adjustment: The Case of the Oil Price Rise. Kyklos, *31*, No. 1, pp. 68 – 85.

ALLEGRET, J. P. – COUHARDE, C. – COULIBALY, D. – MIGNON, V. (2014): Current Accounts and Oil Price Fluctuations in Oil-exporting Countries: The Role of Financial Development. Journal of International Money and Finance, *47*, No. 7, pp. 185 – 201.

BACKUS, D. K. – CRUCINI, M. J. (2000): Oil Prices and the Terms of Trade. Journal of International Economics, *50*, No. 1, pp. 185 – 213.

BANERJEE, A. – DOLADO, J. – MESTRE, R. (1998): Error-correction Mechanism Tests for Cointegration in a Single-equation Framework. Journal of Time Series Analysis, *19*, No. 3, pp. 267 – 283.

BERNANKE, B. (2005): The Global Saving Glut and the US Current Account Deficit. Sandrige Lecture, Virginia Association of Economics. Richmond, Virginia: Federal Reserve Board.

BODENSTEIN, M. – ERCEG, C. J. – GUERRIERI, L. (2011): Oil Shocks and External Adjustment. Journal of International Economics, *83*, No. 2, pp. 168 – 184.

BRUNO, M. – SACHS, J. (1982): Input Price Shocks and the Slowdown in Economic Growth: The Case of UK Manufacturing. The Review of Economic Studies, *49*, No. 5, pp. 679 – 705.

BURBIDGE, J. – HARRISON, A. (1984): Testing for the Effects of Oil-Price Rises Using Vector Autoregressions. International Economic Review, *25*, No. 2, pp. 459 – 484.

CHUKU, C. A. – AKPAN, U. F. – SAM, N. R. – EFFIONG, E. L. (2011): Oil Price Shocks and the Dynamics of Current Account Balances in Nigeria. OPEC Energy Review, *35*, No. 2, pp. 119 – 139.

CUNADO, J. – DE GRACIA, F. P. (2005): Oil Prices, Economic Activity and Inflation: Evidence for some Asian Countries. The Quarterly Review of Economics and Finance, *45*, No. 1, pp. 65 – 83.

DU, L. – YANAN, H. – WEI, C. (2010): The Relationship between Oil Price Shocks and China's Macro-economy: An Empirical Analysis. Energy Policy, *38*, No. 8, pp. 4142 – 4151.

EICHENGREEN, B. (2007): The Real Exchange Rate and Economic Growth. Social and Economic Studies, *56*, No. 4, pp. 7 – 22.

ENGLE, R. – GRANGER, C. (1987): Co-integration and Error Correction: Representation, Estimation and Testing. Econometrica, *55*, No. 2, pp. 251 – 327.

GAVIN, M. (1990): Structural Adjustment to a Terms of Trade Disturbance: The Role of Relative Prices. Journal of International Economics, *28*, No. 3 – 4, pp. 217 – 243.

GISSER, M. – GOODWIN, T. H. (1986): Crude Oil and the Macroeconomy: Tests of some Popular Notions: Note. Journal of Money, Credit and Banking, *18*, No. 1, pp. 95 – 103.

GNIMASSOUN, B. – JOETS, M. – RAZAFINDRABE, T. (2017): On the Link between Current Account and Oil Price Fluctuations in Diversified Economies: The Case of Canada. International Economics, *152*, No. 5, pp. 63 – 78.

GRANGER, C. W. J. (1969): Investigating Causal Relations by Econometric Models and Cross-spectral Methods. Econometrica, *37*, No. 3, pp. 424 – 438.

GRUBER, J. W. – KAMIN, S. B. (2007): Explaining the Global Pattern of Current Account Imbalances. Journal of International Money and Finance, *26*, No. 4, pp. 500 – 522.

HABIB, M. M. – BÜTZER, S. – STRACCA, L. (2016): Global Exchange Rate Configurations: Do Oil Shocks Matter? IMF Economic Review, *64*, No. 3, pp. 443 – 470.

HAMILTON, J. D. (1983): Oil and the Macroeconomy since World War II. Journal of Political Economy, *91*, No. 2, pp. 228 – 248.

HAMILTON, J. D. (1996): This is what Happened to the Oil Price-macroeconomy Relationship. Journal of Monetary Economics, *38*, No. 2, pp. 215 – 220.

HAMILTON, J. D. (2005): Oil and the Macroeconomy. The New Palgrave Dictionary of Economics. 2nd edition. London: Macmillan. ISBN 978-1-349-95190-1.

HUNTINGTON, H. G. (2015): Crude Oil Trade and Current Account Deficits. Energy Economics, *50*, No. 4, pp. 70 – 79.

JOHANSEN, S. (1991): Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. Econometrica, *59*, No. 6, pp. 1551 – 1580.

KILIAN, L. (2009): Not All Oil Price Shocks are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market. American Economic Review, *99*, No. 3, pp. 1053 – 1069.

KILIAN, L. – VIGFUSSON, R. J. (2011): Nonlinearities in the Oil Price-output Relationship. Macroeconomic Dynamics, *15*, No. 3, pp. 337 – 363.

LARDIC, S. – MIGNON, V. (2006): The Impact of Oil Prices on GDP in European Countries: An Empirical Investigation Based on Asymmetric Cointegration. Energy Policy, *34*, No. 18, pp. 3910 – 3915.

LE, T. H. – CHANG, Y. (2013): Oil Price Shocks and Trade Imbalances. Energy Economics, *36*, No. 3, pp. 78 – 96.

MORK, K. A. (1989): Oil and the Macroeconomy when Prices Go Up and Down: An Extension of Hamilton's Results. Journal of Political Economy, *97*, No. 3, pp. 740 – 744.

MORK, K. A. – OLSEN, Ø. – MYSEN, H. T. (1994): Macroeconomic Responses to Oil Price Increases and Decreases in Seven OECD Countries. The Energy Journal, *15*, No. 4, pp. 19 – 35.

OBSFTELD, M. – ROGOFF, K. S. (1996): Foundations of International Macroeconomics. Vol. 30. Cambridge, MA: MIT Press. ISBN 978-0-26-215047-7.

OH, W. – LEE, K. (2004): Causal Relationship between Energy Consumption and GDP Revisited: the Case of Korea 1970 – 1999. Energy Economics, *26*, No. 1, pp. 51 – 59.

OZTURK, I. – ACARAVCI, A. (2010): The Causal Relationship between Energy Consumption and GDP in Albania, Bulgaria, Hungary and Romania: Evidence from ARDL Bound Testing Approach. Applied Energy, *87*, No. 6, pp. 1938 – 1943.

OZLALE, U. – PEKKURNAZ, D. (2010): Oil Prices and Current Account: A Structural Analysis for the Turkish Economy. Energy Policy, *38*, No. 8, pp. 4489 – 4496.

PAPAPETROU, E. (2001): Oil Price Shocks, Stock Market, Economic Activity and Employment in Greece. Energy Economics, *23*, No. 5, pp. 511 – 532.

PESARAN, M. H. – SHIN, Y. – SMITH, R. J. (2001): Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, *16*, No. 3, pp. 289 – 326.

RAFIQ, S. – SGRO, P. – APERGIS, N. (2016): Asymmetric Oil Shocks and External Balances of Major Oil Exporting and Importing Countries. Energy Economics, *100*, No. 56, pp. 42 – 50.

RAUTAVA, J. (2004): The Role of Oil Prices and the Real Exchange Rate in Russia's Economy – a Cointegration Approach. Journal of Comparative Economics, *32*, No. 2, pp. 315 – 327.

RODRIK, D. (2008): The Real Exchange Rate and Economic Growth. Brookings Papers on Economic Activity, *39*, No. 2, pp. 365 – 439.

SARI, R. – HAMMOUDEH, S. – SOYTAS, U. (2010): Dynamics of Oil Price, Precious Metal Prices, and Exchange Rate. Energy Economics, *32*, No. 2, pp. 351 – 362.

TROSTER, V. – SHAHBAZ, M. – UDDIN, G. S. (2018): Renewable Energy, Oil Prices, and Economic Activity: A Granger-causality in Quantiles Analysis. Energy Economics, *70*, No. 2, pp. 440 – 452.

ZAOUALI, S. (2007): Impact of Higher Oil Prices on the Chinese Economy. OPEC Review, *31*, No. 3, pp. 191 – 214.