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RUSYA CARİ İŞLEMLER HESABININ SÜRDÜRÜLEBİLİRLİĞİ: HEPSAĞ, FADF, FKSS BİRİM KÖK TESTLERİ

THE SUSTAINABILITY OF THE CURRENT ACCOUNT IN RUSSIA: HEPSAĞ, FADF, FKSS UNIT ROOT TESTS [1]

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Öz

Rusya, piyasa ekonomisine geçiş sürecinde, cari işlemler hesabı açıklarıyla çalışmanın yapıldığı dönem itibariyle karşılaşmamıştır. Piyasa ekonomisine geçen diğer ülkelerde ise temel bir sorun olarak cari işlemler hesabı açığı görülmüştür. Çalışmanın temel amacı 2003Q1-2020Q1 döneminde Rusya'nın Cari işlemler hesabının sürdürülebilirliğinin Hepsağ (2021), FADF ve FKSS birim kök testleriyle incelemektir. Çalışmada karşılaştırma yapmak üzere uygulanan ADF ve KSS testleriyle, Hepsağ birim kök testi sonucunda Rusya'nın cari işlemler hesabının durağan olmadığı, başka bir ifadeyle cari işlemler hesabının sürdürülemez olduğu sonucuna ulaşılmıştır. FADF ve FKSS testleri sonucunda ise cari işlemler hesabının durağan olduğu tespit edilmiştir. Fourier tabanlı durağanlık testleri sonucunda Rusya'nın cari işlemler hesabının sürdürülebilir olduğu yorumu yapılmıştır. Dünya'daki enerji politikalarında ve savunma sanayi ticaretinde meydana gelen değişimlerle birlikte, ilerleyen dönemlerde Rusya'nın enerji ihracatında meydana gelebilecek değişimlerde göz önüne alındığında konunun önemi ortaya çıkmaktadır.

Anahtar Kelimeler: Cari İşlemler Hesabı, Rusya, Fourier Birim Kök Testleri, Nonlinear Birim Kök Testi

JEL Sınıflaması: F32, F40, F41

Abstract

During the working period, Russia did not encounter current account deficits, which is one of the main problems experienced by the transition economies during the shift to the market-led system. The main purpose of this study is to investigate the sustainability of Russia's current account over the period 2003Q1-2020Q1 using Hepsağ (2021), FADF, and FKSS unit root tests. As a result of ADF, KSS and Hepsağ unit root tests used for comparisons in the study, it was found that the Russian current account is not stationary, i.e., the current account is not sustainable. The FADF and FKSS tests revealed that the current account is stationary, and the current account of Russia is sustainable. The importance of the issue becomes clear when one considers the changes that may occur in Russia's defence industry and energy exports in the future and how energy policies are changing in the world.

Keywords: Current Account, Russia, Fourier Unit Root Tests, Nonlinear Unit Root Test

JEL Classification: F32, F40, F41

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1. Introduction

The sustainability of the current account is one of the issues that economists have been discussing recently. The stationary of the current account or the return of the current account to the average is consistent with the sustainability of the external debt of the country concerned (Chu, Chang, Chang, Su, & Yuan, 2007). A current account deficit in a country is also an indicator of the level of external debt, since the share of imports that exceed exports can only be financed by borrowing from foreigners. Changes in the current account have significant effects on output and employment levels (Krugman, Obstfeld, & Melitz, 2017). The sustainability of the current account balance is essential for economic stability and a more robust economic structure to external shocks.

The current account balance, which reflects the relationship between savings and investment, is closely related to net lending/borrowing and private savings, which are the fundamental elements of economic growth (Aristovnik, 2006). With the increasing effectiveness of free trade policies, efforts to maintain a stable balance of payments have increased, as economic crises can be traced to the balance of payments. The balance of payments is an important indicator of the monetary results of economic exchanges between the inhabitants of a country and the rest of the world in a given period. Previous studies have examined the potential benefits of the current account, or more generally, indicators of external sustainability (McGettigan, 2000).

Studies of current account imbalances based on the intertemporal approach have focused on two methods. One is the stationarity analysis introduced by Trehan and Walsh (1991) and the other is the cointegration method developed by Husted (1992). In this study, the stationarity analysis method proposed by Trehan and Walsh (1991) was used. In this study, unit root tests were applied to the current account series as the method of analysis. According to this method, the stationarity of the current account is a sufficient condition for the maintenance of the intertemporal budget constraint.

The method used to analyse the intertemporal budget constraint is formulated as follows. In an open economy in period t, the budget faced by the government is constraint;

$$C_t + I_t + G_t + B_t = Y_t + (1 + i_t)B_{t-1} \qquad (1)$$

Hereby:

Ct => consumption,

It,=> investment,

Gt => government spending,

Bt => net foreign assets,

Yt => GDP,

i_t => represents the world interest rate.

$$B_t = Y_t - C_t - I_t - G_t + (1 + i_t)B_{t-1} \qquad (2)$$

$$B_t = NX_t + (1 + i_t)B_{t-1} \qquad (3)$$

Here, NX_t is net exports expressed as $Y_t - C_t - I_t - G_t$. Assuming that the interest rate is variable, if equation (3) is iterating forward, the resulting new equation is:

$$B_t = \sum_j^{\infty} = 1 \left(\frac{1}{1+r}\right)^j E_t\left(NX_{t+j} \middle| \Omega_{t-1}\right) + \lim_{T\to\infty}\left(1 + \frac{1}{r}\right)^T E_t(B_{t+T}|\Omega_{t-1}) \qquad (4)$$

Here Ωt−1, denotes the set of information available at the time (t-1). Equation (4) states that international investors can lend to an economy if the present value of the future distribution of net exports equals the present value of net foreign assets. The sustainability hypothesis, which emerged in light of previous information, can be formulated as follows.

$$\operatorname{Lim}_{T\to\infty}\left(1 + \frac{1}{r}\right)^T E_t(B_{t+T}|\Omega_{t-1}) = 0 \qquad (5)$$

According to equations (4) and (5), the present value of an economy's net resource transfers to foreign countries must be equal to the value of that economy's original foreign debt. According to the long-run budget constraint, the no-Ponzi game implies that the present value of the expected stock of debt must equal zero as t approaches infinity. For the fifth equation to be valid, the current account should follow a stationary process according to the method of Trehan and Walsh (1991). $yt = C$ They assume that if Y_t is non-stationary, this indicates that the current account for the observed period is not consistent with the intertemporal budget constraint (Christopoulos & León-Ledesma, 2010).

Russia has recorded a trade surplus and no current account deficit during the period under study. This is probably due to the fact that Russia exports a large amount of fuel. Russia's foreign trade structure is based on two main products, gas and crude oil, which occupy an important place in the world economy (Tovar-García & Carrasco, 2019). Therefore, Russia holds a different place among the countries that have transiting to the market-led economy system. In the study, the sustainability of the current account in Russia was examined using new generation stationary tests according to Trehan and Walsh (1991) intertemporal budget constraint approach. In the next parts, theoretical information on the applied econometric method is presented and, the results of the econometric analyses are given. Finally, evaluation and policy recommendations are presented.

2. Literature Review

The current account has always been a macroeconomic indicator that is carefully monitored, especially in countries with current account deficits. But it is also important for the countries with current account surplus. Research in the literature has focused on the size of current account deficits, their evolution in times of crisis, and their determinants. However, studies on the sustainability of the current account deficit have also increased in the literature. The literature on current account sustainability tends to expand using unit root tests. Therefore, when summarizing the literature researches, studies based on unit root tests are generally included. Among the standard features of the studies in the literature, especially in recent studies, it can be observed that nonlinearity and Fourier-based analyses are increasing. In the literature, the results of traditional tests and the results of innovative tests have been compared. Different results have been obtained due to the variety of tests applied. Current account sustainability is an important topic not only for developing economies but also for developed countries. For the current account variable used in the analysis in most of the studies, it is generally considered as the ratio of current account deficit to GDP. Examples from the literature include the following:

Table 1. Literature Summary

Author	Period	Country - Country Group	Method	Conclusion
Wu (2000)	1977-1997	10 OECD Countries	ADF-IPS	According to ADF test, current account of Spain is sustainable; 9 other countries are unsustainable. 10 countries are unsustainable according to IPS test.
Chortareas, Kapetanios, and Uctum (2004)	1970-2000	Argentina, Bolivia, Brazil, Chile, Colombia, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, and Venezuela	KSS	According to overall results of the study current accounts are sustainable.
Dülger and Özdemir (2005)	1974-2001	G-7 countries	Fractional unit root	Current account is sustainable in France, Italy, and Canada; unsustainable in Germany, UK, USA and Japan.
Kalyoncu (2006)	1960-2002	22 OECD Countries	ADF and IPS unit root tests	ADF-generally unsustainable in OECD countries, on the other hand IPS- is sustainable.
Lau, Baharumshah, and Haw (2006)	1976-2001	In 5 Asian countries	ADF, KPSS, DFGLS, Harris and Tzavalis (1999) and Breitung (2000)	According to overall results of the study current accounts are sustainable.

Chu et al. (2007)	1980-2004	48 African countries	SURADF	Current account is unsustainable in Algeria, Congo, Cote d'Ivoire, Guinea, Guinea-Bissau, Mauritania, Morocco, Swaziland, Tanzania, Uganda and Zambia, sustainable for the remaining 35 African countries.
Chen (2010)	1960-2018	USA, France, UK and Canada	ADF, Bierens (1997), nonlinear unit root tests.	According to ADF test current account is unsustainable in 4 countries. According to NADF current account is sustainable.
Cunado, Gil-Alana, and De Gracia (2010)	1960-2005	European countries	Ng-Perron unit test	Current account is sustainable in Belgium, Ireland, Italy, Spain and Switzerland.
Holmes, Otero, and Panagiotidis (2010)	1975-2005	13 European countries	IPS ADF, KPSS, Bootstrap Hadri unit root tests	According to the Hadri Test results, current account is sustainable for European countries.
Chen (2011)		10 OECD Countries	Nonlinear unit root tests	Current account is unsustainable for Australia, Czech Republic, Finland, Hungary, New Zealand, Portugal and Spain.
Ceylan and Çeviş (2012)	1987-2012	Turkey	KSS, LNV, LNV-Sollis, Auto-regressive nonlinear unit root tests	While it can be sustained in the 1987:1-2001:4 period, it cannot be sustained in the 2002:1-2012:1 period.
Cuestas (2013)	1999-2011	In transition economies in Europe.	Panel unit root tests (Levin, Lin and Chu, IPS, ADF etc.) and nonlinear panel unit root tests KSS and Sollis (2009) test	Current account is sustainable in Czechia, Estonia, Lithuania and Latvia.
Bozoklu and Yılancı (2014)	1996-2009	Brazil, Colombia, Czech Republic, Hungary, Indonesia, Peru, Russia and South Africa	IPS, Ucar and Panel KSS	Linear panel unit root test findings are sustainable in Russia and Indonesia. The nonlinear panel unit root test finding is sustainable in Indonesia.
Donoso and Martin (2014)	1970-2010	Latin America countries	Park and Shintani (2005) nonlinear unit root test	Unsustainable in Brazil, Chile, Argentina, Paraguay, Colombia, Ecuador, El Salvador and Guatemala; sustainable in Dominican Republic, Honduras, Mexico,

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				Panama, Peru, Uruguay, Venezuela.
Lanzafame (2014)	1980-2008	27 Developed Countries	Panel PUR, KSS, SPSM	Sustainable for seven countries, unsustainable for 20 other countries.
Chen and Xie (2015)	1970-2012	Nine countries	Linear and LNV-ADF, LNV-Sollis	Australia, Belgium, Czech Republic, Finland, New Zealand, Norway, Ireland, and Portugal are sustainable; Spain is unsustainable.
Kuo (2016)	1976-2013	Taiwan, Korea, the Philippines, Thailand, Singapore and Japan'	with ADF and Quantile tests	Overall results of the study presented that it is sustainable.
Ceylan, Uz, and Çeviş (2018)	1990-2014	Fragile Five	KSS and AESTAR unit root tests	As a result of nonlinear unit root tests, it is sustainable for Turkey, India and Indonesia.
Gürdal, Kırca, İnal, and Değirmenci (2018)	1972-2017	Turkey	ADF, Fourier ADF	Current account is sustainable according to the result of traditional unit root tests.
Hasdemir, Omay, and Denaux (2019)	1998-2017	Brazil, Russia, India, China and South Africa	Nonlinear Unit Root Tests	LNV and CEO Test=> In Russia and India are sustainable EG, Sollis (2009), OY, OEHa=> In all BRIC countries are unsustainable KSS => In India is sustainable; other countries are not. OEHb=>In Russia is sustainable; other countries are not.
Saraç and Sivri (2019)	1992-2017	Turkey	ADF, PP, KPSS, Ng, and Perron (2001), Lee and Strazicich unit root tests with one and two breaks	According to traditional unit root tests and single fraction unit root tests are generally unsustainable; sustainable according to the analysis that allows two breaks.
Demircioğlu Karabıyık (2020)	1996-2019	In Latin America countries	Multivariate Augmented Dickey-Fuller panel unit root test	Overall results of the study showed that current account is sustainable.

3. Econometric Methodology and Analysis

Quarterly data from the period 2003Q1-2020Q4 were used in this study. Hepsağ, FADF, and FKSS stationary tests were used as econometric methods to analyse Russian CA/GDP series stationarity.

3.1. ADF and KSS Unit Root Tests

Augmented Dickey-Fuller (1979) and Kapetanios, Shin, and Snell (2003) unit root tests, which ignore the multiple structural breaks in the data generation process, were applied to be able to compare it with the Fourier unit root tests in our study. Equations (6) and (7) below are estimated for the ADF test (Dickey & Fuller, 1979).

$$\Delta X_t = \beta_0 + \beta_1 X_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta X_{t-i} + u_t \quad (6)$$

$$\Delta X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 trend + \sum_{i=1}^{k} \lambda_i \Delta X_{t-i} + u_t \quad (7)$$

In the KSS test, where the structural change is modelled as an exponential smooth transition, the null hypothesis tests expressed as non-stationary, are estimated using the following model (Kapetanios, Shin, & Snell, 2003).

$$\Delta y_t = \sum_{j=1}^{p} \gamma \Delta_{t-j} + y_{t-1}^3 + \varepsilon_t \quad (8)$$

Table 2. ADF and KSS test results

ADF		KSS		
Constant	Constant & Trend	Case1	Case 2	Case 3
-2.379 (11)	-2.946 (11)	-2.538 (12)**	-2.196 (12)	-0.906 (12)

Notes: *,**,*** show the significance at the 1%, 5% and 10% levels, respectively. Numbers in the parentheses show the optimal lag length.

According to the results of the ADF test, the series CA /GDP of Russia was found to contain a unit root. According to the results of the KSS test, the series was found to have a unit root for cases 2 and 3, which confirms the result of the ADF test, while for case 1, the series was stationary at the 5% significance level.

3.2. Hepsağ Unit Root Test

In the unit root test procedure of Hepsağ (2021), which treats structural breaks and nonlinearity together, structural breaks are modelled with a logistic smooth transition function, and nonlinearity is modelled with an ESTAR model. The test is considered as an alternative to the Leybourne, Newbold, and Vougas (1998) and Kruse (2011) tests, trying to model the structural change as a smooth transition between different regimes over time and to model nonlinearity with the ESTAR model proposed by Kruse (Hepsağ, 2021).

Model A : $y_t = \alpha_1 + \alpha_2 S_t(\lambda, \tau) + v_t$ (9)

Model B : $y_t = \alpha_1 + \beta_1 t + \alpha_2 S_t(\lambda, \tau) + v_t$ (10)

Model C: $y_t = \alpha_1 + \beta_1 t + \alpha_2 S_t(\lambda, \tau) + \beta_2 t S_t(\lambda, \tau) + v_t$ (11)

v_t the error term distributed with 0 mean and 1 variance, $S_t(\lambda, \tau)$ is the logistic smooth transition function.

$$S_t(\lambda, \tau) = [1 + \exp\{-\lambda(t - \tau T)\}w]^{-1} \lambda > 0 \quad (12)$$

τ parameter determines the timing of the transition midpoint, and the λ parameter determines the transition speed. Assuming that the error term (v_t) in Model A, assuming zero mean y_t is stationary around a mean from α_1 to $\alpha_1 + \alpha_2$. Model B has a similar form to Model A, but allows for a fixed slope term. In Model C, the changes in the intercept change simultaneously on the slope and with the transition rate from β_1 to $\beta_1 + \beta_2$.

The unit root hypothesis can be expressed as:

$$H_0 : y_t = \mu_t, \mu_t = \mu_{t-1} + \varepsilon_t \quad (13)$$

In the first step, the model uses the nonlinear least squares (NLS) algorithm to predict A, B, and C, and then the NLS residuals are calculated.

Model A: $\hat{v}_t = y_t - \hat{\alpha}_1 - \hat{\alpha}_2 S_t(\hat{\lambda}, \hat{\tau})$ (14)

Model B: $\hat{v}_t = y_t - \hat{\alpha}_1 - \hat{\beta}_1 t - \hat{\alpha}_2 S_t(\hat{\lambda}, \hat{\tau})$ (15)

Model C: $\hat{v}_t = y_t - \hat{\alpha}_1 - \hat{\beta}_1 t - \hat{\alpha}_2 S_t(\hat{\lambda}, \hat{\tau}) - \hat{\beta}_2 t S_t(\hat{\lambda}, \hat{\tau})$ (16)

Kruse's (2011) unit root test was applied to the residuals from the first stage in the second stage. According to the developed strategy, Kruse (2011) is followed in the ESTAR model, which was modified as follows, and a non-zero position parameter c is allowed:

$$\Delta\hat{v}_t = \gamma\hat{v}_{t-1}1(-exp\{-\theta(\hat{v}_{t-1}-c)^2\}) + \varepsilon_t \quad (17)$$

The following auxiliary regression is obtained using a first-order Taylor expansion.

$$\Delta\hat{v}_t = \delta_1\hat{v}_{t-1}^3 + \delta_2\hat{v}_{t-1}^2 + \sum_{i=1}^{p}\psi_i\Delta\hat{v}_{t-i} + \varepsilon_t \quad (18)$$

In the auxiliary regression, the primary hypothesis is set up as $H_0 : \delta_1 = \delta_2 = 0$, and the alternative hypothesis is set up as $H_1 : \delta_1 < \delta_2 = 0$. In the alternative hypothesis, one parameter is one-sided, and the other is two-sided, which is not suitable for obtaining a standard Wald-type test statistic. Accordingly, the test statistics are calculated as a modified Wald type test based on the one-sided parameter and the transformed two-sided parameter:

$$\tau_{SNL\alpha} = \tau_{SNL\alpha(\beta)} + \tau_{SNL\alpha\beta} = \left(\hat{\psi}_{22} - \frac{\hat{\psi}_{21}^2}{\hat{\psi}_{11}}\right)\left(\hat{\delta}_2 - \hat{\delta}_1\frac{\hat{\psi}_{21}}{\hat{\psi}_{11}}\right)^2 + 1(\hat{\delta}_1 < 0)\frac{\hat{\delta}^2}{\hat{\psi}_{11}} \quad (19)$$

These statistics are new statistics for a unit root hypothesis against nonlinear and single smooth break stationarity. $\hat{\psi}_{22}$, $\hat{\psi}_{11}$ and $\hat{\psi}_{21}$ are the elements of the Variance-Covariance matrix. Consider $\tau_{SNL\alpha}$ as Model A test statistic, $\tau_{SNL\alpha(\beta)}$ as Model B test statistic, and $\tau_{SNL\alpha\beta}$ as Model C test statistic. It is decided whether the series has a unit root by comparing it with the critical values specified by Hepsağ (2021).

Table 3. Hepsağ Unit root test results

$\tau_{SNL\alpha}$	Lag length	$\tau_{SNL\alpha\beta}$	Lag length
1.251	12	0.441	12

$\tau_{SNL\alpha}$= 1.251 and $\tau_{SNL\alpha\beta}$ = 0.441 values calculated in our study were less than the table critical values. In this case, H_0 hypothesis cannot be rejected, and thus it is concluded that the series has a unit root.

3.3. FADF and FKSS Unit Root Tests

The study adopted the FADF and FKSS stationarity tests developed by Christopoulos and Leon-Ledesma (2010), which consider smooth changes and significant structural breaks and do not need to specify the number, form, or form duration of structural breaks. These unit root tests use trigonometric variables to capture significant changes in the deterministic terms of the variable, considering the following model:

$$y_t = \delta_0 + \delta_1 sin\left(\frac{2\pi kt}{T}\right) + \delta_2 cos\left(\frac{2\pi kt}{T}\right) + v_t \quad (20)$$

k presents the number of frequencies of the Fourier function, while trend term is presented by t. T is the sample size and $\pi = 3.1416$, the frequency number takes an integer value between 1 and 5. The Fourier ADF and Fourier KSS test are used for linear and nonlinear series, respectively, while the H_0 hypothesis states that the series contains a unit root.

$H_0: v_t = \mu_t, \mu_t = \mu_{t-1} = h_t$s

Here h_t is assumed to be a stationary process with a mean of zero. The first step for the calculation of test statistics developed by Christopoulos and Leon-Ledesma (2010) is to determine the corresponding frequency value (k^*) . For k values between 1 and 5, the nonlinear deterministic component is estimated in Model 1 using the OLS method, and the k value that minimizes the residual sum of squares is chosen. Then the OLS residuals of the model are calculated.

$$\hat{v}_t = y_t - \hat{\delta}_0 + \hat{\delta}_1 sin\left(\frac{2\pi k^* t}{T}\right) + \hat{\delta}_2 cos\left(\frac{2\pi k^* t}{T}\right) \quad (21)$$

In the next step of method, applied unit root test to the LS residuals. Linear and nonlinear models were developed for unit root analysis.

$$\Delta v_t = \alpha_1 v_{t-1} + \sum_{j=1}^{p}\beta_j\Delta v_{t-j} + u_t \quad (22)$$

$$\Delta v_t = \rho v_{t-1} + (1 - \exp(-\theta\Delta v_{t-i}^2)) + \sum_{j=1}^{p}\alpha_j\Delta v_{t-j} + u_t \quad (23)$$

$$\Delta v_t = \lambda v_{t-1}^3 + \sum_{j=1}^{p}\beta_j\Delta v_{t-j} + u_t \quad (24)$$

Where $\theta > 0$ and u_t is the white noise error term. Suppose that the primary hypothesis expressing the existence of a unit root is rejected in the second step. In this case, the trigonometric terms were examined using in the third step using the F-test for model 1. In this step, the basic hypothesis H_0: $\delta1 = \delta2 = 0$ is tested against the alternative hypothesis H_1: $\delta1 = \delta2 \neq 0$ If the basic hypothesis is rejected, it can be concluded that the variable is stationary around a deterministic function with a break. The significance of trigonometric terms is tested with critical values in the study of Becker, Enders, and Lee (2006). The main advantage of this test is that it considers structural breaks and nonlinear structures together.

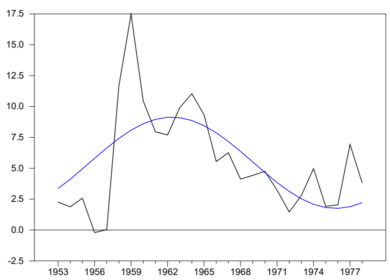
Table 4. Fourier ADF and Fourier KSS unit root test results

k	FADF	FKSS	F_j	Lag length
1	-4.59771*	-4.30389*	7.72385	1

Note: * shows the significance at the 1% level.

After the FADF and FKSS unit root tests, which account for structural changes and nonlinearity, the series CA /GDP was found to contain no unit root, i.e., it is stationary. Moreover, the trigonometric terms in the calculated deterministic part were significant. As a result, the validity of the Fourier tests used and the internal fractions determined by these tests with a smooth transition (both in terms of date and number) were found to be statistically significant.

Figure 1. Plots of Current Account of Russia and Fitted Nonlinearities



When the graph in Figure 2 is observed, it can be assumed that the Fourier function is generally compatible with the series and successfully captures long-term oscillations.

4. Conclusion

Many studies in the literature have focused on the sustainability of current account deficits, which is one of the most critical problems experienced by the former Soviet Union countries during the transition to a market economy. During the study period, Russia had a foreign trade surplus and did not encounter any balance of payments deficit. This is probably due to the fact that Russia exports a large amount of fuel. Russia's foreign trade structure is based on two main products, gas and crude oil, which occupy an important place in the world economy (Tovar-García & Carrasco, 2019).

In this study, the sustainability of Russia's current account was analysed using stationary tests. The ADF test showed that the series contains a unit root, i.e. the current account is not sustainable. Also, the results of the KSS test generally support the result of the ADF test obtained in this study. Our KSS test results also support the KSS test results of Hasdemir, Omay, and Denaux (2019). Then, the unit root test of Hepsağ (2021) was applied, which deals with structural breaks and nonlinearity, and the results of the empirical analysis supported the results of the first two unit root tests. As a result of the FADF and FKSS unit root tests used in the study, which, compared to other tests, take into account both smooth changes and significant structural breaks and do not need to specify the number, shape or duration of structural breaks, the Russian CA /GDP series was found to be stationary. This means that the Russian current account is sustainable during the period under study. The study's empirical results show the importance of using Fourier-based unit root tests in the stationarity method when studying the sustainability of the current account.

Many developed countries are looking for other sources of energy. Due to the damage they cause to the environment, they are turning to concepts such as recyclable and green energy instead of petroleum-based energy consumption. It is believed that a global policy for clean and sustainable energy could negatively affect Russia's foreign trade balance. It is essential to show the impact of export diversification on Russia's foreign trade balance for the future studies.

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