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**Research Article / *Araştırma Makalesi***

# DO NORTH AMERICAN COUNTRIES DOMINATE THE CONFLICT IN THE WORLD? EVIDENCE FROM BENOIT HYPOTHESIS

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## ABSTRACT

*In recent years, it has been observed that the scope of globalization has increased the need for security, and the world borders have been removed. The fact that countries are rapidly developing their defense industries shows that they consider this situation normal. The validity of the Benoit Hypothesis, which emphasizes that increases in defense expenditures will positively affect economic growth, was discussed for the period 1988-2022, and an interregional analysis was made in this study. Evidence supporting the Benoit Hypothesis has been obtained only in the North America, which allocates the highest share to defense expenditures. According to the findings, growth is not affected when defense expenditures are increased, but economic growth decreases when defense expenditures are reduced. The results obtained in this study, which includes interregional analysis, provide comprehensive information and it is thought that country groups that make defense expenditures in order to generate income from the defense industry have emerged and this will provide important evidence in world politics.*

***Keywords:*** *Defense Expenditures, Benoit Hypothesis, SIPRI Stockholm International Peace Research Institute*

***JEL Classification:*** *H5, H56, I3, I38*

# DÜNYADAKİ ÇATIŞMALARI KUZEY AMERİKA ÜLKELERİ Mİ DOMİNE EDİYOR? BENOIT HİPOTEZİ'NDEN BİR DELİL

## ÖZET

*Son yıllarda küreselleşmenin etkisiyle dünya genelinde sınırların kalkmasının beraberinde güvenlik ihtiyacını arttırdığı görülmektedir. Ülkelerin savunma sanayilerini hızla geliştirmeleri bu durumu normal gördüklerini göstermektedir. Savunma harcamalarındaki artışların ekonomik büyümeyi olumlu yönde etkileyeceğini vurgulayan Benoit Hipotezinin geçerliliği 1988-2022 dönemi için ele alınmış ve bu çalışmada bölgeler arası bir analiz yapılmıştır. Benoit Hipotezini destekleyen kanıtlar yalnızca savunma harcamalarına en yüksek payı ayıran ABD'de elde edilmiştir. Bulgulara göre, savunma harcamaları arttığında ekonomik büyüme etkilenmemekte ancak savunma harcamaları azaldığında ekonomik büyüme azalmaktadır. Bölgeler arası analizlerin yer aldığı bu çalışmada elde edilen sonuçlar kapsamlı bilgiler sunmakta olup, savunma sanayisinden gelir elde etmek amacıyla savunma harcaması yapan ülke gruplarının ortaya çıktığı ve bunun dünya siyasetinde önemli deliller sağlayacağı düşünülmektedir.*

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***JEL Sınıflandırması:*** *H5, H56, I3, I38*

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## 1. Introduction

Defense service, which is among the full public goods and services; is among the countries' priorities. Since it is an indicator of the existence of states, defense service also causes significant shares to be allocated in resource distribution. States can create an armed force to meet their security needs and enter an arms race for this purpose (Dunne et al., 2008: 293). The size of defense services varies from country to country, and this is explained by the "Butter or Guns" theory, which emphasizes that choices are effective. This theory suggests that increased defense spending reduces spending on other parts of the government budget. The relationship between defense expenditures and economic growth was first discussed by Mercantilists and then by Classical Economists until economics was accepted as a branch of science—however, the origins of empirical studies on this subject date back to E. Benoit in 1973.

Benoit (1973) argues in his study that there is a positive relationship between military expenditures and economic growth. In 1978, Benoit discussed the impact of defense expenditures on economic growth in underdeveloped countries between 1960 and 1967. He stated that defense expenditures concern the entire country and have a positive effect on the basic needs of individuals, and economic development is also positively affected by this situation. According to Benoit, if a country makes military spending itself rather than spending money to buy from foreign suppliers, the government itself will promote the economy.

The direction of the relationship between defense expenditures and economic growth differs between classical economists and Keynesian economists. Namely; While classical economists emphasize that there is no causality from defense expenditures to growth and that military expenditures have no effect on growth, Neoclassicals argue that investing in security, which is an essential component of a country's prosperity, is necessary to maximize the welfare of society. Defense expenditures and personnel (military, police) expenditures are increasing. If domestic production is not encouraged to meet the increasing demand and it is not possible to eliminate R&D expenditures through imports, a deficit may occur in the current account balance. If defense expenditures lead to domestic production, this will increase employment. The Marxist model does not claim that military expenditures have purely positive or negative effects. The last one is the institutionalist model, which emphasizes that there are firms, companies and individuals who benefit from military expenditures and that they will form lobbies that will encourage the government to spend military expenditure even if it is not for the benefit of the country (Aycan Özer, 2017: 12).

From a macroeconomic perspective, defense expenditures have significant effects. These effects are three: demand effects, supply effects and security effects (Şit, 2018:197). According to the first one, the demand effect; Because military spending has opportunity costs and can crowd out other types of spending, such as investment, the scope and form of crowding out following an increase in military expenditure varies depending on previous use and how the increase is financed. According to the supply effect; Military expenditures create positive externalities through the spread of technology, human capital and employment, especially from the military sector to the civilian sector, through the availability of production factors and technology that determine the potential output. Security impact; The security of persons and property against internal and external threats is essential for the functioning of markets and the incentives for investment and innovation. To the extent that military spending increases security, it can also increase output.

According to SIPRI's most recent data covering the years 2017-2021, 25 countries provide 99% of the world's arms supply. The five countries with the largest share among suppliers are the USA, Russia, France, China, and Germany. These five largest volume suppliers accounted for 77% of international arms trade during the period examined (SIPRI, 2022). This shows that countries contribute to their economic growth to meet their own demands and supply weapons to many other countries in the world.

**Table 1: World Military Spending, 2022**

| Region | Spending (US$ b.) | Change (%)2021-2022 |
|---|---|---|
| Africa | 39.4 | -5.3 |
| North Africa | (19.1) | -3.2 |
| Sub-Saharan Africa | 20.3 | -7.3 |
| Americas | 961 | 0.3 |
| Central America and Caribbean | 11.2 | -6.2 |
| North America | 904 | 0.7 |
| South America | 46.1 | -6.1 |
| Asia and Oceania | 575 | 2.7 |
| Central Asia | 1.4 | -29 |
| East Asia | 397 | 3.5 |
| Oceania | 35.3 | 0.5 |
| South Asia | 98.3 | 4.0 |
| South East Asia | 43.1 | -4.0 |
| Europe | 480 | 13 |
| Central and Western Europe | 345 | 3.6 |
| Eastern Europe | 135 | 58 |
| Middle East | (184) | 3.2 |
| **World total** | **2 240** | **3.7** |

Not: ( ) = uncertain estimate; . . = data unavailable; Spending figures are in current (2021) US$; All changes are in real terms for the period 2021-2022.

**Source:** SIPRI (2023). *SIPRI Military Expenditure Database*. Retrieved from https://www.sipri.org/sites/default/files/SIPRI-NATO-milex-data-1949-2015.xlsx Accessed 31.05.2022

When looking at the security impact of defense expenditures, terrorism and major crises lead to new security problems. New terrorism in the modern world is defined by the following features: terrorism carries processes that challenge states and target groups (Martin, 2017:65).

- Loose, cell-based networks with minimal command lines,
- Purchasing high-intensity weapons and weapons of mass destruction upon request,
- Politically ambiguous, religious or mystical motivations
- Asymmetric methods to maximize losses,
- Skillful use of the Internet and manipulation of the media.

**Table 2: Regional Defense Expenditures in the World, 1998-2022**

| Region | 1998 | 2000 | 2005 | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **World** | 1064.2 | 1123.5 | 1454.1 | 1803.0 | 1777.6 | 1786.9 | 1810.2 | 1859.0 | 1932.1 | 1992.2 | 2006.6 | 2240 |
| **Africa** | 13.4 | 17.4 | 21.4 | 32.6 | 38.5 | 37.1 | 36.5 | 34.7 | 35.8 | 36.4 | 36.9 | 39.4 |
| North Africa | 4.9 | 4.8 | 6.8 | 10.5 | 17.3 | 17.4 | 16.9 | 16.4 | 17.5 | 18.3 | 18.0 | 19.1 |
| Sub-Saharan Africa | 8.6 | 12.6 | 14.5 | 22.1 | 21.1 | 19.8 | 19.7 | 18.4 | 18.4 | 18.0 | 18.8 | 20.3 |
| **Americas** | 505.3 | 525.0 | 755.7 | 940.5 | 761.3 | 758.1 | 756.7 | 778.8 | 818.6 | 856.2 | 845.8 | 961 |
| Central America and the Caribbean | 4.0 | 4.3 | 4.0 | 5.5 | 6.8 | 7.4 | 7.0 | 7.6 | 8.4 | 10.2 | 10.0 | 11.2 |
| North America | 474.9 | 494.3 | 721.7 | 893.4 | 710.6 | 708.7 | 705.5 | 726.0 | 765.7 | 801.7 | 791.8 | 904 |
| South America | 26.3 | 26.5 | 30.0 | 41.6 | 43.9 | 41.9 | 44.2 | 45.2 | 44.5 | 44.3 | 44.1 | 46.1 |
| **Asia & Oceania** | 182.1 | 196.7 | 252.5 | 345.3 | 433.8 | 456.2 | 476.8 | 494.9 | 519.4 | 534.2 | 553.1 | 575 |
| Oceania | 15.4 | 16.0 | 18.5 | 23.2 | 25.8 | 28.2 | 28.3 | 28.0 | 29.1 | 30.5 | 31.6 | 35.3 |
| South Asia | 33.1 | 38.7 | 49.2 | 65.8 | 71.7 | 78.0 | 83.4 | 87.8 | 92.7 | 90.1 | 90.8 | 98.3 |
| East Asia | 112.3 | 121.4 | 159.4 | 222.7 | 294.4 | 306.2 | 319.6 | 336.8 | 353.6 | 367.5 | 385.7 | 397 |
| South East Asia | 21.0 | 20.3 | 24.7 | 32.4 | 41.6 | 42.2 | 43.9 | 40.7 | 41.9 | 44.3 | 43.2 | 43.1 |
| Central Asia | 0.3 | 0.3 | 0.7 | 1.2 | 0.2 | 1.6 | 1.5 | 1.6 | 2.0 | 1.8 | 1.7 | 1.4 |
| **Europe** | 273.8 | 287.6 | 305.6 | 332.0 | 335.9 | 347.8 | 339.3 | 345.9 | 363.7 | 381.3 | 392.6 | 480 |
| Central Europe | 18.1 | 17.7 | 20.6 | 19.8 | 22.7 | 23.0 | 24.8 | 28.0 | 31.7 | 33.9 | 34.4 | 0 |
| Eastern Europe | 16.2 | 23.6 | 36.0 | 51.2 | 77.7 | 81.6 | 66.9 | 65.7 | 69.2 | 71.5 | 73.2 | 135 |
| Western Europe | 239.6 | 246.4 | 249.0 | 260.9 | 235.5 | 243.1 | 247.6 | 252.2 | 262.8 | 275.8 | 285.1 | 345 |
| **Middle East** | 89.6 | 96.6 | 119.1 | 152.7 | 208.2 | 187.7 | 200.8 | 204.7 | 194.6 | 184.2 | 178.2 | 184 |

**Source:** SIPRI (2023). *SIPRI Military Expenditure Database*. Retrieved from https://www.sipri.org/sites/default/files/SIPRI-NATO-milex-data-1949-2015.xlsx Accessed 31.05.2022

According to the Stockholm International Peace Research Institute (SIPRI) report, total global military expenditures in 2021 will be around 2 trillion dollars.

In the following sections of this study, some studies in the literature are included, and in the last section, the Benoit hypothesis is tested. The research findings were evaluated, interpreted, and policy recommendations made. It is seen that defense and security policies change and differentiate with technological progress and have a positive impact on countries' economic growth.

## 2. Literature Review

It is seen that the relationship between economic growth and defense expenditures is essential, as many studies have been carried out from past to present. After Benoit (1973; 1978), studies have addressed this relationship in many aspects. Researchers examining the effects of defense expenditures on the economy have conducted many studies revealing the direction and degree of the impact and have also included the relationship between defense expenditures

and inflation, employment and balance of payments. It is important to evaluate the effects of defense expenditures on the economy. Its effects also vary depending on the components and types of expenditure, cyclical factors and the governance structures of the countries.

Table 3 contains studies in the literature, and as can be seen, some of the studies indicate that defense expenditures affect the economy positively, some indicate that it affects the economy negatively, while others indicate that it has no effect on the economy at all.

**Table 3: Literature Review (1984-2022)**

| **Defense spending negatively affects economic growth** | **Defense spending positively affects economic growth** | **There is no relationship between defense spending and economic growth** |
|---|---|---|
| Cappalen et. al., 1984;<br>Knight et. al., 1996;<br>Roux, 1996;<br>Pradhan, 2001;<br>Ra & Singh 2005;<br>Keller et. al., 2009;<br>Pieroni, 2009;<br>Alptekin, 2012;<br>Huskic, et. al., 2020; | Knight et. al., 1996;<br>Dunne, 2001;<br>Ateşoğlu, 2002;<br>Karagöl & Palaz 2004;<br>Dritsakis 2004;<br>Gökbunar & Yanıkkaya 2004;<br>Halıcıoğlu 2004;<br>Yıldırım et. al., 2005;<br>Sümer, 2005;<br>Karagöl, 2006;<br>Kalyoncu & Yücel 2006;<br>Wijeweera & Webb 2009;<br>Paradhan, 2010;<br>Ozsoy & Ipek 2010;<br>Addesa & Caruso 2012;<br>Soyyiğit Kaya, 2013;<br>Korkmaz & Bilgin 2017;<br>Rudy, 2022;<br>Dramene, 2022;<br>Yardımcı, 2022;<br>Erdinç & Aydınbaş, 2022; | Payne & Ross, 1992;<br>Mintz & Stevenson, 1995;<br>Kim, 1996;<br>Kollias, 1997;<br>Dakurah et. al., 2001;<br>Görkem & Işık, 2008;<br>Ali, 2011;<br>Topal 2018;<br>Doğan & Timur 2017;<br>Gölpek et. al., 2020;<br>Nugroho & Pervanti, 2021;<br>Topal, 2018; |
| **Macroeconomic Variables- Economic growth, Inflation-Current account balance-Employment** | | |
| **Defense spending excludes investment and education spending** | **Defense Spending increases social welfare** | |
| Huang & Mintz 1992;<br>Dunne & Perlo-Freeman 2003;<br>Galvin, 2003;<br>Rodrik, 2003;<br>Marwah & Klein 2005;<br>Bilmes & Stiglitz 2008; | Yıldırım & Sezgin, 2002;<br>Lai & Thyne, 2007;<br>Zhang et. al., 2017; | |

**Source:** Edited by authors.

In the literature studies on defense expenditures in Turkey in the last twenty years, the predominance is that there is no causality relationship. It is stated that economy, exchange rate, trade, network-internet, informatics and artificial intelligence have now replaced arms/power wars (Gölpek et. al., 2020: 143).

## 3. Data and Econometric Model

The validity of the Benoit hypothesis, which argues that defense expenditures increase economic growth, was tested in this study using aggregated data of country groups compiled by SIPRI for the period 1988-2022. In this sampling, by using aggregated data of countries in the world and geographical regions, it is investigated in which of these regions the Benoit hypothesis is valid.

In this context, it is focused on relationship between economic growth (*growth*) and aggregated defense expenditures (*def*) as follows;

$$growth = c + \beta.def + u_t \quad (1)$$

The descriptive statistics of defence expenditures are represented in Table 4.

**Table 4: Descriptive Statistics of Defence Expenditures**

| | Europe | Central E. | Middle East | North A. | South As. | Sub-Sah. A. | World | USA | Turkiye |
|---|---|---|---|---|---|---|---|---|---|
| Mean | 25.16 | 367.11 | 127.64 | 710.03 | 54.12 | 18.32 | 1594.40 | 691.203 | 101.354 |
| Median | 21.50 | 348.06 | 112.40 | 740.02 | 49.91 | 18.97 | 1593.13 | 714.959 | 96.471 |
| Maximum | 48.75 | 615.58 | 208.83 | 936.39 | 99.41 | 55.62 | 2181.92 | 917.092 | 176.384 |
| Minimum | 19.26 | 292.40 | 63.13 | 497.95 | 25.95 | 7.98 | 1111.55 | 483.724 | 49.267 |
| Std. Dev. | 7.66 | 79.59 | 47.51 | 132.72 | 24.16 | 8.58 | 338.25 | 130.257 | 28.713 |
| Skewness | 1.700 | 2.005 | 0.357 | -0.170 | 0.466 | 2.345 | -0.022 | -0.154 | 1.031 |
| Kurtosis | 4.888 | 6.321 | 1.648 | 1.938 | 1.889 | 11.269 | 1.645 | 1.958 | 4.033 |
| Jarque-Bera | 22.063 | 38.417 | 3.412 | 1.814 | 3.065 | 131.811 | 2.602 | 1.723 | 7.751 |
| Probability | 0.000 | 0.000 | 0.182 | 0.404 | 0.216 | 0.000 | 0.272 | 0.423 | 0.021 |

Recent studies are generally carried out by obtaining parameter estimates using vector autoregressions such as VEC (vector error correction) or ARDL (auto-regressive distributed lagged) models. However, some models need a nonlinear decomposition of the variables according to the model needs or economic theory. Therefore, asymmetric analysis methods gained popularity according to the relevant needs. NARDL (Nonlinear Autoregressive Distributed Lagged) model is the most popular method which examine nonlinear asymmetric relationships. In addition, linear and nonlinear ARDL models avoid pretesting of the order of integration, which differs from other cointegration analyses. This is because the bounds testing approach is regardless of the integration orders of series according to the assumption that many economic variables are integrated in orders, whether I (0) or I (1) (Pesaran et al., 2001), (Shin et al., 2014). Therefore, linear or nonlinear unit root tests are bypassed in the procedure flow. Moreover, the models work well[1] even in small samples, which provides a distinct advantage (Ghatak & Siddiki, 2001).

1 The estimated coefficients are unbiased and efficient even for small sample sizes (Pesaran et al., 2001).

However, it should be known that the residuals of linear models should be tested for various possible deviations from independence including linear dependence, non-linear dependence, or chaos. For nonlinear dependence, Brock et al. (1996) developed BDS test. The BDS test is a nonparametric test of the null hypothesis that the data is independently and identically distributed (*i.i.d.*) against an unspecified alternative.

**Table 5: BDS Tests for Linear Models**

| Dimension | Europe | Central E. | Middle East | North A. | South As. | Sub-Sah. A. | World | USA | Turkiye |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 0.829 | -0.001 | 0.001 | 0.027* | 0.000 | 0.016 | 0.000 | 0.022* | -0.004 |
| 3 | 0.163 | -0.011* | 0.022* | 0.039* | -0.005 | -0.032 | 0.000 | 0.025* | -0.015*** |
| 4 | 0.003 | -0.043* | 0.024** | 0.043* | -0.183* | -0.102* | -0.019* | 0.027* | -0.014 |
| 5 | 0.046** | -0.041* | 0.049* | 0.061* | -0.191* | -0.077* | -0.021* | 0.041* | -0.008 |
| 6 | 0.105*** | -0.039* | 0.071* | 0.075* | -0.200* | -0.058** | -0.023* | 0.064* | 0.000 |

*, ** and *** indicate significance at 01%, 05% and 10% levels, respectively.

BDS test results for ARDL models are represented in Table 5. According to Table 5, linear models for Equation-1 are affected by nonlinear dependencies in the data and the residuals are dependent which means that not distributed *i.i.d.* against a nonlinear specification. Therefore, a nonlinear or an asymmetric modelling approach is needed for the specification of Equation-1.

The NARDL method, one of the most frequently used methods in asymmetric analysis, is based on the ARDL (Autoregressive Distributed Lagged) model given in Equation-2.

$$\Phi(L)\, y_t = \alpha_0 + \beta' x_{it} + \alpha_1 \psi_t + u_t \tag{2}$$

Here, *"t", "i",* and *"j"* symbolize the time, the delay in the series and the period when the cumulative sum is taken, *L* the delay operator and the $\psi_t$ vector the deterministic variables, respectively.

It can be expressed as $\Phi(L)=1-\sum_{i=1}^{\infty} \Phi L_i$ ve $\beta(L)=\sum_{i=1}^{\infty} \beta_k L_k$

The joint integration regression obtained from this model is given theoretically in Equation-3.

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- \tag{3}$$

In Equation-3, long-term parameters are symbolized as β+ and β-. These are the values of the long-term parameter differentiated according to increases and decreases.

In the point of $x_t = x_0 + x_t^+ + x_t^-$, the decompositions can be defined as $x_t^+ = \sum_{j=1}^{m} x_t^+ = \sum_{j=1}^{m} max(\Delta x_j^t, 0)$ and $x_t^- = \sum_{j=1}^{m} x_t^- = \sum_{j=1}^{m} max(\Delta x_j^t, 0)$ respectively. According to the decomposition of $x_t$, asymmetric conditional error correction model is expressed as follows:

$$\Delta y_t = \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1} + \sum_{j=1}^{p-1} \Delta y_{j-t} + \sum_{j=1}^{q} (\pi_j^+ \Delta x_{t-j}^+ + \pi_j^- \Delta x_{t-j}^-) + e_t \quad j=1,2,\ldots,p \tag{4}$$

Equation-4 shows the long-term equilibrium parameters, $\theta^{+}=-\rho\beta^{+}$ and $\theta^{-}=-\rho\beta^{-}$, and $\pi^{+}=-\beta^{+}\varphi_i+\psi_{2i}$ and $\pi^{-}=-\beta^{-}\varphi_i+\psi_{2i}$ show the short-term coefficients that support model fit.

Equation-4, $H_a$:$\varrho\neq\theta^{+}\neq\theta^{-}\neq0$ indicates the existence of long-term equilibrium. As in the ARDL bounds test, if the bounds F test statistic is higher than the upper critical value, $H_0$:$\varrho=\theta^{+}=\theta^{-}=0$ is rejected and provides evidence for the existence of a long-term equilibrium relationship between the levels of the variables $y_t$, $x_t^{+}$, $x_t^{-}$.

$y_t$, $x_t^{+}$, $x_t^{-}$ in the long-term coefficients of the variables $\theta=\theta^{+}=\theta^{-}$ and the short term dynamics $\pi^{+}=\pi$ or if $\sum_{i=0}^{q}\pi_i^{-}=\sum_{i=0}^{q}\pi_i^{+}$), t here is no asymmetry. The existence of asymmetry depends on these values being statistically different from each other. The asymmetric dynamic multiplier effects of a unit change in $x_t^{+}$, $x_t^{-}$, on $y_t$, $L_h^{+}$ and $L_h^{-}$ are presented in Equation-5 and Equation-6, respectively.

$$L_h^{+}=\sum_{j=0}^{h}\frac{\partial yt-j}{\partial x_t^{+}} \tag{5}$$

$$L_h^{-}=\sum_{j=0}^{h}\frac{\partial yt-j}{\partial x_t^{-}} \tag{6}$$

NARDL models given theoretically in Equation-7 according to the regions and countries considered are presented in Table-6. The regions and countries discussed are Europe, Central Europe, Middle East North America, South Asia, Sub-Saharan Africa, the whole world, Turkey and the United States of America (USA), respectively.

The reason why TR and the USA were added to these groups is to highlight whether the situation regarding the USA follows a different course compared to the rest of the world.

**Table 6: NARDL Model Results**

| | **Europe** | **Central E.** | **Middle East** | **North A.** | **South As.** | **Sub-Sah. A.** | **World** | **Turkiye** | **USA** |
|---|---|---|---|---|---|---|---|---|---|
| constant | 3.366 | 20.776 | 6.873* | 2.161 | 4.683** | -0.001 | 2.808** | 5.596* | 2.365 |
| $growth_{-1}$ | -0.188 | 0.031 | -0.179 | -0.414** | 0.034 | 0.320*** | -0.260 | -0.181 | -0.424** |
| $growth_{-2}$ | -0.266 | | | -0.276 | | | -0.293 | | -0.283 |
| $def^{+}_{t}$ | 0.050 | 0.627 | -0.007 | -0.030 | -0.006 | 0.013 | -0.002*** | 0.000 | 0.001** |
| $def^{+}_{t-1}$ | -0.073 | -1.242 | | 0.003 | | 0.397** | | | 0.001 |
| $def^{+}_{t-2}$ | | 0.680 | | 0.058*** | | 0.012 | | | 0.001*** |
| $def^{+}_{t-3}$ | | | | -0.045** | | -0.439** | | | 0.001** |
| $def^{-}_{t}$ | 0.002 | 0.900 | 0.158*** | -0.019* | -0.836 | 0.683*** | -0.011*** | -0.001 | 0.001* |
| $def^{-}_{t-1}$ | | 0.721 | -0.121 | | | -0.741** | | | |
| $def^{-}_{t-2}$ | | -1.124** | | | | | | | |
| $R^2$ | 0.121 | 0.340 | 0.222 | 0.575 | 0.010 | 0.516 | 0.390 | 0.083 | 0.572 |
| Adj.$R^2$ | -0.042 | 0.139 | 0.111 | 0.446 | -0.089 | 0.368 | 0.157 | -0.009 | 0.441 |
| F-stat | 0.741 | 1.692 | 1.998 | 4.444* | 0.105 | 3.499** | 1.676 | 0.907 | 4.387* |
| DW-d | 2.054 | 2.000 | 1.493 | 2.330 | 2.033 | 2.206 | 2.123 | 2.053 | 2.283 |

*, ** and *** indicate significance at 1%, 5% and 10% levels, respectively.

In order to examine the economic relationship given in Equation-1, in addition to the data of seven geographical regions, NARDL models derived from the ARDL model in Equation-2 for Turkey and the USA can be expressed as in Equation-7.

$$\Phi(L)\, growth_t = \alpha_0 + \beta^{+} def_t^{+} + \beta^{-} def_t^{-} + u_t \quad (7)$$

Focusing on Table 6, the most striking point is that all of the NARDL results, except for North America, the World in general and the USA, indicate that economic growth did not undergo any change despite the changes in defense expenditures.

In other words, these models do not provide evidence of the validity of the Benoit hypothesis. Indicators such as t-statistics, R2, and F statistics in the models do not provide any evidence for the validity of the Benoit hypothesis.

The parameter estimates are generally statistically significant for North American countries. Other diagnostic indicators also support this situation, which applies to the world in general.

The fact that the parameter estimates of other regions are obtained as meaningless, while the opposite significant relationship is found for the world in general reveals that the North American region significantly dominates this phenomenon for the world in general.

The significance of the parameter estimates of the USA, which has made significant interventions in other regions within this region, especially the Middle East, shows that the USA supports its economic growth to a certain extent with its investments in defense expenditures.

While symmetric analyzes are generally performed in the relevant literature, more clear and striking findings were found in these methods, which are considered asymmetric. However, like the ARDL model, NARDL models can also reveal the existence of long-term equilibrium with the bounds F test. F- Boundary test statistics are presented in Table-7.

**Table 7: Bound Test Statistics and Error Correction Coefficients**

| | Europe | Central E. | Middle East | North A. | South As. | Sub-Sah. A. | World | Turkiye | USA |
|---|---|---|---|---|---|---|---|---|---|
| Bounds F Test | 7.456* | 8.829* | 13.188* | 11.824* | 10.201* | 5.235* | 9.607* | 14.2* | 11.793* |
| Error Corr. | -1.454* | -0.969* | -1.179* | -1.69* | -0.966* | -0.68* | -1.553* | -1.181* | -1.707* |

*, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Bounds test statistics are between values 5.15 and 6.36 at the 1% level.

When the bounds test statistics are examined, they are above the upper bound value at the 99% confidence level. This shows that the significance of long-term coefficients regarding the existence of a long-term relationship can be examined.

In other words, it technically shows that defense expenditures are a variable that can affect economic growth. However, although this result alone is a necessary finding to continue the analysis with the relevant sample, it is insufficient.

For this, in addition to ensuring the assumptions regarding the method applied in joint integration regressions, the slope parameter estimates must also be statistically significant.

In Table 7, since there is a long-term relationship in all samples from geographical regions, the error correction model presented in Equation 4 is examined for such relationships. In this model, error correction coefficients are obtained. These coefficients estimate how long it will take to return to equilibrium parameter values if there is any deviation from the long-term equilibrium.

The fact that these values are statistically significant, negative, and between zero and -1 allows economic inferences to be made regarding the return to equilibrium values.

Table 7 shows that although all error correction coefficients are significant at the 99% confidence level, some are less than -1. Although this situation shows that the error correction coefficients are economically meaningless, it provides evidence that a very rapid convergence to equilibrium values occurs in a much shorter period of one year.

**Table 8: Long-Term Coefficients**

| | **Europe** | **Central E.** | **Middle East** | **North A.** | **South As.** | **Sub-Sah. A.** | **World** | **Türkiye** | **ABD** |
|---|---|---|---|---|---|---|---|---|---|
| $def^{+}$ | -0.016 | 0.067 | -0.006 | -0.009* | -0.006 | -0.026 | -0.001** | 0.001 | 0.001* |
| $def^{-}$ | 0.001 | 0.513 | 0.031 | -0.011* | -0.866 | -0.085 | -0.007*** | -0.001 | 0.001* |
| constant | 2.316 | 2.144 | 5.830* | 1.279*** | 4.846** | -0.002 | 1.808** | 4.738* | 1.385** |

*, ** and *** indicate significance at 1%, 5% and 10% levels, respectively.

Table 8 presents long-term parameter estimates. These values, called long-term equilibrium (joint integration) coefficients, give the values of Equation-1 decomposed into asymmetric coefficients.

Although symmetric long-term coefficients are generally obtained in studies investigating the validity of the Benoit hypothesis, recent developments in econometric literature have revealed that asymmetric coefficients also provide various evidence in research on the Benoit hypothesis.

Focusing on the populations of the relevant geographical regions, it can be seen that the findings regarding the North American region, the world in general and the USA obtained in Table 6 are strongly confirmed in terms of long-term coefficients. Obtaining evidence that the Benoit hypothesis is valid worldwide, focusing on North American countries, requires concentrating specifically on this group of countries. In this context, it reveals the importance of the results to the USA, which has made direct or indirect military or economic interventions in many strategic regions worldwide until today.

Focusing on the coefficients presented in Table 8, the slope coefficients of defense expenditures worldwide are negative and statistically significant.

When these coefficients are decomposed asymmetrically for the periods of increase and decrease, they show that the decrease in defense expenditures increases seven times more than the increase in economic growth (-0.007/-0.001=7).

However, this rate appears to be at similar values for North American countries (-0.009 for increase and -0.011 for decrease). There is no asymmetric effect in the population of this geographical region. In summary, it reveals a negative relationship between defense expenditures and economic growth in the world and the North American region.

This situation does not support the Benoit hypothesis. However, the fact that the coefficients obtained for the USA are positive and statistically significant shows that the Benoit hypothesis is supported in the case of the USA.

The fact that the coefficients are obtained in the same proportion and are positively related for both the decrease and the increase shows that the relationship discussed in Equation 1 is linear and not asymmetrical for this country. In the case of Turkiye, it is seen that the relationship in Equation 1 is meaningless. In other words, no evidence has been obtained that the Benoit hypothesis is valid in Turkiye.

## 4. Conclusion

The countries' geopolitical positions, location in a problematic region, and location at the intersection of the world's most important energy centres reveal the importance given to the defence industry. For this reason, this phenomenon, which was first named and started to be researched in 1973, has been frequently researched on a country-specific basis and has added a certain richness to the relevant literature.

There are not enough studies in the relevant literature on whether the Benoit hypothesis, which is frequently researched across countries geopolitically, is valid for country groups and which geographical region in the world supports this hypothesis. Instead of focusing on country specifics, this study provides an overview of whether the Benoit hypothesis is valid regarding geopolitically united country groups and using worldwide data.

The study used aggregated data of country groups compiled by SIPRI. In this context, a result regarding the validity of the Benoit hypothesis was obtained only for the world in general, and it was revealed that this result was supported, especially for North American countries. However, for these country groups, evidence has been obtained that the relationship is negative, not as supported by the Benoit hypothesis, and for the USA, the hypothesis is valid regarding the direction of the relationship and its statistical significance.

In the study, especially by choosing the non-linear-asymmetric method, it was investigated that the parameter estimates differ in cases of increase and decrease. Statistically, significant parameter estimates were obtained, especially in worldwide data. As a result, evidence has been received that there is no economic growth based on defense expenditures in the countries considered other than the USA, and that defense expenditures only positively affect economic growth in the USA.

Findings show that the USA's ongoing military interventions in various regions of the world and indirect increases in defence expenditures support economic growth with a multiplier effect. Focusing on asymmetric effects, it was observed that the long-term parameter estimates were the same for both decreases and increases, but a reverse effect occurred.

This situation indicates that the USA cannot afford to decrease defense expenditures. It may provide preliminary information for more detailed analyzes specific to US data. In the case of Turkey, it can be stated that no evidence can be obtained for the existence of the Benoit hypothesis that economic growth is not statistically significantly affected by defense expenditures, especially in the reality of ongoing conflicts and military investments in the East of Turkey for years, and that eliminating such problems will not lead to any decrease in economic growth.

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**Conflict of Interest**

No potential conflict of interest was declared by the author.

**Author Contributions**

BHB conceptualized the study. MKB conducted all analyses, created and figures and tables, MKB and BHB wrote manuscript and interpreted the data. Both authors have read and approved the final manuscript.

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