The Relationship Between Public Expenditures and Openness in the MIST Countries

MIST Ülkelerinde Kamu Harcamaları ve Dışa Açıklık Arasındaki İlişki

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Abstract

After the Second World War, increases were observed in both public expenditures and openness, and researchers started to investigate the relationship between these two variables. As a result of the investigations, three hypotheses revealing the relationship between public expenditures and openness were developed. These hypotheses are the compensation hypothesis, the efficiency hypothesis, and the deindustrialization hypothesis. According to the compensation hypothesis, there is a positive relationship between openness and public expenditures, and openness increases public expenditures. On the other hand, according to the efficiency hypothesis, there is a negative relationship between public expenditures and openness, and openness reduces public expenditures. Finally, according to the deindustrialization hypothesis, there is no relationship between public expenditures and openness.

In the present study, the effect of openness on public expenditures in the MIST (Mexico, Indonesia, South Korea, and Turkey) countries was tested via panel data analysis using annual data for the 1960-2021 period. In this respect, as a result of the LM cointegration test, it was concluded that there was a cointegration relationship between the variables of public expenditures and openness. Afterward, a coefficient estimate was made for the variables with the CUP-FM and BA-OLS tests, and a positive relationship was revealed between the variables of public expenditures and openness. Finally, the result of the Fisher causality test supported the result of the LM cointegration test. Thus, it was concluded that the compensation hypothesis was valid in the MIST countries for the 1960-2021 period.

Keywords: Globalization, Public Expenditures, Openness, Compensation Hypothesis, Efficiency Hypothesis, Panel Data Analysis.

Paper Type: Research

Öz

İkinci Dünya Savaşı'ndan sonra hem kamu harcamalarında hem de dış açıkta artışlar olduğu görülmüş ve araştırmacılar tarafından bu iki değişken arasındaki ilişki araştırılmaya başlanmıştır. Yapılan araştırmalar sonucunda kamu harcamaları ile dış açıklık arasındaki ilişkiyi ortaya koyan üç hipotez geliştirilmiştir. Söz konusu hipotezler telafi hipotezi, etkinlik hipotezi ve sanayisizleşme (deindustrialization) hipotezidir. Telafi hipotezine göre dış açıklık ile kamu harcamaları arasında pozitif yönlü ilişki söz konusu olup dış açıklık kamu harcamalarını artırmaktadır. Diğer yandan etkinlik hipotezine göre kamu harcamaları ile dış açıklık arasında negatif yönlü ilişki söz konusu olup dış açıklık kamu harcamalarını azaltmaktadır. Son olarak sanayisizleşme hipotezine göre ise kamu harcamaları ile dış açıklık arasında ilişki söz konusu değildir.

Bu çalışmada MIST (Meksika, Endonezya, Güney Kore ve Türkiye) ülkelerinde dışa açıklığın kamu harcamaları üzerindeki etkisi 1960-2021 dönemi için yıllık veriler kullanılarak panel veri analizi ile test edilmiştir. Bu bağlamda yapılan LM eşbütünleşme testi sonucunda kamu harcamaları ve dışa açıklık

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değişkenleri arasında eşbütünleşme ilişkisi olduğu sonucuna ulaşılmıştır. Daha sonra CUP-FM ve BA-OLS testleri ile değişkenler için katsayı tahmini yapılmış ve kamu harcamaları ile dışa açıklık değişkenleri arasında pozitif yönlü ilişki olduğu ortaya koyulmuştur. Son olarak yapılan Fisher nedensellik testi sonucu da LM eşbütünleşme testi sonucunu destekler nitelikte olup MIST ülkelerinde 1960-2021 dönem aralığında telafi hipotezinin geçerli olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Küreselleşme, Kamu Harcamaları, Dışa Açıklık, Telafi Hipotezi, Etkinlik Hipotezi, Panel Veri Analizi.

Makale Türü: Araştırma

Introduction

The question of how public expenditures will be affected as a result of openness, which started to be observed with the globalization that emerged in the 1980s, has begun to attract the attention of many economists. As a result of the studies, some researchers have concluded that openness will increase public expenditures, and other researchers have concluded that openness will reduce public expenditures, whereas still other researchers have concluded that there is no relationship between openness and public expenditures. Along with the increase in the openness rate worldwide with globalization, the countrywide risks have also started to increase. According to the compensation hypothesis, since these risks will be paid by the state, there is a positive relationship between public expenditures and openness. According to the efficiency hypothesis, public expenditures decrease as a result of the loss of income experienced by the state due to openness, and in this case, there is an inverse relationship between public expenditures and openness. On the other hand, according to the deindustrialization hypothesis, there is no relationship between the variables discussed.

In this study focusing on the relationship between public expenditures and openness in the MIST countries, theoretical information and a literature summary on the subject are presented first. Then, an econometric analysis is conducted to reveal the relationship between public expenditures and openness.

1. Theoretical Background on Public Expenditures and Openness

There are three hypotheses in the literature investigating the relationship between public expenditures and openness. These are the compensation hypothesis, the efficiency hypothesis, and the deindustrialization hypothesis. According to the compensation hypothesis, there is a positive relationship between public expenditures and openness. According to the efficiency hypothesis, there is a negative relationship between public expenditures and openness. According to the deindustrialization hypothesis, there is no causality relationship between public expenditures and openness.

Studies by Cameron (1978) and Rodrik (1998) are two important studies suggesting the compensation hypothesis.

According to the compensation hypothesis, there is a positive relationship between openness resulting from globalization and public expenditures. According to this hypothesis, as openness increases, the country's external risk and income inequality will increase, and people will ask the government to spend on social security to decrease this risk and inequality. In this context, to decrease the increasing risks and losses of individuals, the government will try to eliminate the negative effect of the arising risks and losses by increasing public expenditures among fiscal policy instruments and to prevent the loss of welfare of people (Rodrik, 1998).

According to the efficiency hypothesis, the foreign trade deficit reduces public expenditures and leads to a decrease in public size. According to this hypothesis, since the increase in public expenditures is not suitable for the operating conditions of the free market, it impairs the competitiveness of national companies, and therefore, companies in international markets want the state to decrease its intervention in the economy.

While the compensation hypothesis addresses the relationship between openness and public expenditures in terms of demand, the efficiency hypothesis addresses this effect in terms of supply (Tütüncü & Zengin, 2018: 82).

2. Literature Summary

Studies on public expenditures and openness have mostly focused on the compensation hypothesis or the efficiency hypothesis. Some studies support the compensation hypothesis, whereas others support the efficiency hypothesis. Moreover, when the literature is reviewed, there are studies suggesting no relationship between public expenditures and openness, in addition to the compensation and efficiency hypotheses. Thus, there has been no consensus on this issue in previous studies. Some studies suggesting that the compensation hypothesis is valid between public expenditures and openness are summarized below:

Cameron (1978) was the first person who researched the relationship between public expenditures and openness. In the pioneering study by Cameron (1978), correlation and regression analysis was conducted for 18 OECD countries for the 1960-1975 period, and it was concluded that trade openness caused an increase in public expenditures, in other words, the compensation hypothesis was valid. According to Cameron, labor unions, which gained strength with the increase in the industrialization rate in countries with high openness, work more actively, and in this case, unions make demands such as social security, pensions, unemployment insurance, and job training by putting pressure on the government to eliminate the risks caused by openness. These demands cause an increase in public expenditures. Rodrik (1998) performed panel data analysis for 23 OECD countries for the 1990-1992 and 1985-1989 periods, using regression, correlation analysis, and fixed and random effects methods. According to the results acquired, the relationship between public expenditures and openness in these periods and countries was the highest when the external risk was at the highest level. In this respect, the compensation hypothesis is valid. The study by Shelton (2007) concluded that the compensation hypothesis was valid by performing panel data analysis for 101 developed and developing countries for the 1970-2000 period. Epifani & Gancia (2009) concluded that the compensation hypothesis was valid by revealing a strong relationship between public expenditures and openness via panel data analysis for 143 countries for the 1950-2000 period. In the study by Kimakova (2009), the financial integration variable was employed as an indicator of openness, and panel data analysis was carried out. The study that focused on the 1976-2003 period concluded that the compensation hypothesis was valid for 87 developed and developing countries. Rivas et al. (2009) revealed a long-term positive relationship between public expenditures and openness using Johansen's cointegration analysis for Spain for the 1960-2000 period. In this context, the compensation hypothesis is valid. With the cointegration analysis and FMOLS analysis conducted for Pakistan for the 1971-2006 period, Shahbaz et al. (2010) concluded that the compensation hypothesis was valid. The analysis was carried out by Abounoori & Ghaderi (2011) in MENA countries using the panel data method for the 2000-2007 period, and a conclusion supporting the compensation hypothesis was reached. Zeren & Ergün (2013) conducted a panel causality analysis between trade openness and public size for 15 European countries for the 1970-2011 period and found a one-way causality relationship from trade openness toward public size. It was determined that the compensation hypothesis was valid in this respect. An ARDL analysis was carried out by Taşar (2016) for Turkey for the 1961-2014 period, and it was concluded that the compensation hypothesis was valid. The study by Ceylan & Yılmaz Şahin (2018) used the Engle-Granger cointegration approach and error correction model for the 1998:1-2016:4 period and concluded that the compensation hypothesis was valid. Tütüncü & Zengin (2019) investigated the relationship between public expenditures and openness with the panel cointegration test with multiple breaks for the MIST countries for the 1987-2015 period. According to the results acquired, the compensation hypothesis was valid for Mexico and Turkey, while the efficiency hypothesis was valid for Indonesia and Nigeria.

Some studies suggesting that the efficiency hypothesis is valid between public expenditures and openness are summarized below:

The study by Garrett & Mitchell (2001) conducted panel data analysis on 18 OECD countries for the 1961-1993 period and concluded that openness led to a negative effect on public expenditures, in other words, the efficiency hypothesis was valid. In their study using EKC analysis for 96 countries in 1990, Garen & Trask (2005) concluded that the efficiency hypothesis was valid. In the study by Liberati (2007), panel data analysis was performed for European countries, the USA, Canada, Australia, New Zealand, and Japan, and it was found that the efficiency hypothesis was valid between 1965 and 2005. Ram (2009) concluded that the efficiency hypothesis was valid for the 1960-2000 period using panel data analysis for 154 countries. The panel data analysis performed by Erauskin (2011) for 16 OECD countries by considering the financial openness variable as an openness indicator concluded that the efficiency hypothesis was valid in the 1970-2004 period. Altay & Aysu (2013) revealed a cointegration relationship between public expenditures and openness via the panel cointegration analysis they conducted for 17 countries for the 1974-2010 period, whereas the coefficients were estimated using the DOLS estimation method. A negative relationship was found between these variables. In this respect, the efficiency hypothesis is valid. The study conducted by Petrou (2014) found that the efficiency hypothesis was valid for 102 selected countries with the Bayesian model average method applied for the 1976-2010 period. Demir (2019) concluded that the efficiency hypothesis was valid by revealing that openness reduced public expenditures in his analysis conducted using the CCE-MG and AMG coefficient estimators along with the Westerlund (2007) cointegration test for 28 OECD countries for the 1980-2016 period. Özek & Bayat (2020) conducted a panel data analysis in BRICS countries for the 1991-2018 period and found that the efficiency hypothesis was valid.

Some studies suggesting that there is no relationship between public expenditures and openness are summarized below:

In the study by Molana et al. (2004), time series analysis and country-based cointegration and causality analyses were carried out for 23 industrialized OECD countries for the period 1948-1998, but no strong evidence could be found for the existence of a relationship between openness and public expenditures. Gemmel et al. (2008) determined that there was no relationship between public expenditures and openness by analyzing panel data for 25 OECD countries in the 1980-1997 period. In the study performed by Benarroch & Pandey (2012), the relationship between openness and public expenditures for 119 countries for the 1972-2000 period was examined by panel causality analysis. According to the results acquired, it was revealed that there was no relationship between the said variables in the countries for the period addressed. Aydoğuş & Topçu (2013) concluded that there was no long-term relationship between public size and trade openness as a result of the cointegration and causality analysis conducted on Turkey for the 1974-2011 period. Şener et al. (2015) performed the Johansen-Juselius cointegration analysis and Granger causality analysis for Turkey for the 1975-2013 period and concluded that there was no relationship between public expenditures and openness.

Upon reviewing the literature, it was seen that there were no other studies conducted on the MIST countries, which distinguishes this study from others. Accordingly, it is assumed that this study will contribute to the literature.

3. Econometric Analysis on The Relationship Between Public Expenditures and Openness

3.1. Data Set

To reveal the relationship between public expenditures and openness in the MIST countries, an analysis was conducted with annual data for the 1960-2021 period. The share of public consumption expenditures, which was considered a dependent variable in the study, in

GDP reveals the public size in economies. Moreover, the openness indicator, which was employed as an independent variable, is the share of the sum of exports and imports in GDP and is one of the most used indicators for openness. Table 1 summarizes detailed information about the data used in the study.

Table 1: Information about the data

Variable	Variable Description	Data Source
gc	Share of public consumption expenditures in GDP	World Bank, 2022
open	Share of the sum of exports and imports in GDP	World Bank, 2022

In the econometric analysis section of the study, the letter "d" at the beginning of the variable symbols indicates that the difference of the variable is taken, whereas the letter "l" indicates that the logarithm is taken. In Table 1, the dependent variable is the "gc" variable, while the independent variable is the "open" variable.

3.2. Method

Panel data analysis was employed to reveal the relationship between public expenditures and openness in the MIST countries. Since there is a trend in the "lgc" and "lopen" variables involved in the analyses, models with constants and trends were considered in the analyses.

3.3. Cross-Sectional Dependence Analysis

First, it should be investigated whether there is cross-sectional dependence in the variables and model to be used in the analysis because unit root and cointegration tests will be selected depending on whether there is cross-sectional dependence.

Table 2: Cross-sectional dependence test

Tests/ Variables	With Constant and Trend			
	lgc		lopen	
	Test Stat.	p-value	Test Stat.	p-value
LM	35.276***	0.000	33.027***	0.000
CD$_{LM}$	8.451***	0.000	7.802***	0.000
CD	-5.596***	0.000	-4.770***	0.000

Note: ***, refers to a 1% significance level.

Tablo 3: Cross-sectional dependence test for the panel

Tests/ Variables	Panel	
	Test Stat.	p-value
LM	30.997***	0.000
CD$_{LM}$	7.216***	0.000
CD	3.206***	0.001

Note: ***, refers to a 1% significance level.

According to the LM test developed by Breusch-Pagan (1980) and the CDLM and CD tests developed by Pesaran (2004), there is cross-sectional dependence for both "gc" and "open" variables and for the panel in Tables 2 and 3. In this sense, second-generation stationarity tests will be used for the stationarity analysis of the series, and second-generation cointegration tests will be used for the cointegration relationship between the series.

3.4. Homogeneity Test Analysis

It was checked whether the model established was homogeneous with the homogeneity tests developed by Pesaran & Yamagata (2008).

Table 4: Homogeneity test for the panel

Tests/Variables	Panel	
	Test Stat.	p-value
Δ	2.768***	0.003
Δ_{adj}	2.836***	0.002

Note: ***, refers to a 1% significance level.

In line with the results of the homogeneity tests conducted in Table 4, it was concluded that the model was heterogeneous.

3.5. Unit Root Analysis

In accordance with the cross-sectional dependence test performed to reveal whether there was cross-sectional dependence in the variables of "lgc" and "lopen," it was concluded that there was cross-sectional dependence in both variables. Therefore, second-generation unit root tests must be used to reveal whether the variables contain unit roots.

Among the second-generation unit root tests, the "BN Panic (2004)" test was developed by Bai & Ng (2004), the "BN (2010)" test was developed by Bai & Ng (2010), the "WL PANNICA (2009)" test was developed by Westerlund & Larsson (2009), and the "RW (2016)" test was developed by Reese & Westerlund (2016).

Table 5: Second-generation unit root tests

2nd-Generation Unit Root Test	With Constant and Trend			
	lgc		lopen	
	Test Stat.	p-value	Test Stat.	p-value
BN Panic (2004)	0.939	0.174	0.637	0.262
BN (2010)				
PA	0.184	0.573	1.006	0.843
Pb	0.195	0.577	1.364	0.914
WL PANICCA (2009)				
Ze	-1.468*	0.071	-1.255	0.105
RW (2016)				
PA	0.209	0.583	-1.230	0.109
Pb	0.224	0.588	-1.084	0.139

Note: 1. The AIC Information criterion was used. The maximum delay length was taken as 2.

2. "Bartlett" was taken as varm.

3. For the PANIC test, the number of common factors is defined by the IC_{p2} criterion of Bai & Ng (2002), taking the maximum number of factors as 3.

4. *, refer to 10% significance levels.

Tablo 6: Second-generation unit root tests

| 2ⁿᵈ-Generation Unit Root Test | With Constant and Trend | | | |
| | dlgc | | dlopen | |
	Test Stat.	p-value	Test Stat.	p-value
BN Panic (2004)	5.588***	0.000	16.421***	0.000
BN (2010)				
PA	-30.150***	0.000	-26.572***	0.000
Pb	-10.229***	0.000	-9.051***	0.000
WL PANICCA (2009)				
Ze	-3.840***	0.000	-10.070***	0.000
RW (2016)				
PA	-33.275***	0.000	-2.441***	0.007
Pb	-10.521***	0.000	-1.799**	0.036

Note: 1. The AIC Information criterion was used. The maximum delay length was taken as 2.

2. "Bartlett" was taken as varm.

3. For the PANIC test, the number of common factors is defined by the IC_{p2} criterion of Bai & Ng (2002), taking the maximum number of factors as 3.

4. *** and ** refer to 1% and 5% significance levels, respectively.

According to the second-generation unit root tests, it was concluded that the lgc and lopen variables were not stationary at the level but stationary in their first differences. Thus, the lgc and lopen series are I(1). Therefore, the existence of the relationship between the variables was checked by the LM cointegration test.

3.6. LM (Westerlund & Edgerton, 2007) Cointegration Test

The LM cointegration test, developed by Westerlund & Edgerton in 2007, was used to investigate whether there was a cointegration relationship between the variables addressed in the study. It can be said that the LM cointegration test is an important cointegration test since it takes into account cross-sectional dependence, allows autocorrelation and variable variance, and also yields successful results in small samples (Westerlund Edgerton, 2007: 186-188). In this context, the study also used the LM cointegration test to check whether there was a cointegration relationship between lgc and lopen.

Table 7: LM cointegration test

| Test | With Constant and Trend | |
	Test Stat.	boot.p-value
LM	8.935	0.056

Note: 1. For the LM cointegration test, Bartlett's method and long-term variance estimator were used with int(4*(T/100)^(2/9)) bandwidth.

2. Since there was cross-sectional dependence in the model, bootstrap probability values were taken into consideration.

3. Since LM tests yielded better results in trend-containing series, the model with a constant and trend was considered.

4. Probability values were obtained by 1000 repetitive bootstrap simulation.

In accordance with the test conducted, hypothesis H₀, which was established as "there is cointegration," was not rejected at the 5% significance level (p > 0.05), and it was concluded that there was a cointegration relationship between the lgc and lopen variables.

3.7. Coefficient Estimation Tests

After the cointegration relationship was identified, the CUP-FM and BA-OLS coefficient estimation tests were used for model estimation. These tests consider cross-sectional dependence

and make it possible for explanatory variables I(1) to be included in the model. The CUP-FM coefficient estimator, Continuously Updated Fully Modified Ordinary Least Squares, was developed by Bai & Kao (2005). BA-OLS, Bias-Adjusted Ordinary Least Squares, was developed by Westerlund (2007).

Table 8: Coefficient estimation tests

Test	Beta Coefficient	Test stat.	p-value
CUP-FM	0.317	6.921***	0.000
BA-OLS	0.328	7.159***	0.000

Note:**1.** The AIC Information criterion was used.
2. The maximum number of factors to 3.
3. *** refers to a 1% significance level.

According to Table 9, the coefficients calculated for the independent variable in the model are significant for CUP-FM and BA-OLS, and the coefficient sign is positive. Hence, the values obtained for parameter estimation in all three tests are statistically significant. According to the OLS-CD test, a 1% increase in the "lopen" variable increases the "lgc" variable by 0.179%. In line with the CUP-FM test, a 1% increase in the "lopen" variable increases the "lgc" variable by 0.317%. In accordance with the BA-OLS test, a 1% increase in the "lopen" variable increases the "lgc" variable by 0.328%.

3.8. Causality Test

The Fisher causality test developed by Emirmahmutoglu & Kose (2011) was used to investigate whether there was a causality relationship between the "lgc" and "lopen" variables.

Table 9: Fisher causality test

Test	Test stat.	p-value	Conclusion
lgc $\rightarrow$ lopen	2.870	0.942	There is no causality.
lopen $\rightarrow$ lgc	29.389***	0.000	There is causality.

Note: 1. The AIC Information criterion was used. The maximum delay length was taken as 2.
2. Probability values were obtained by 1000 repetitive bootstrap simulation.
3. ***, refers to a 1% significance level.

According to the Fisher causality test, there is no causality from the lgc variable toward the lopen variable, whereas there is causality from the lopen variable toward the lgc variable. It was revealed that openness was the cause of public expenditures, and the compensation hypothesis was valid.

Conclusion

Globalization has caused shocks and affected economies in all countries. In this respect, the effect of openness on macroeconomic variables, especially public expenditures, has been researched for long years. Some studies conducted on this subject suggest that there is a relationship between public expenditures and openness, while other studies claim that there is no relationship. In line with the compensation hypothesis, which examines the relationship between public expenditures and openness, openness increases public expenditures. According to the efficiency hypothesis, openness decreases public expenditures. In accordance with the deindustrialization hypothesis, there is no relationship between public expenditures and openness.

To decide whether first-generation or second-generation unit root analysis should be conducted for the variables addressed, the cross-sectional dependence test was first performed for the variables, and it was concluded that there was cross-sectional dependence in the variables. In this context, second-generation unit root tests were carried out to determine whether there was a unit root in the variables. Afterward, homogeneity and cross-sectional dependence tests were performed for the model where the dependent variable was lgc and the independent variable was lopen. As a result of the tests, it was decided that the said model was heterogeneous and there was cross-sectional dependence in the model. Afterward, the LM cointegration test was used to check whether there was a cointegration relationship between the variables discussed. The cointegration test showed that there was a cointegration relationship between the variables. After reaching the conclusion that there was a cointegration relationship between the variables, the coefficient estimates of the variables addressed through the CUP-FM and BA-OLS tests in the model were made, and it was concluded that there was a positive relationship between the lgc and lopen variables according to the coefficient estimates. In other words, an increase in the lopen variable increases the lgc variable. Finally, between the variables addressed, the Fisher causality test was carried out, and it was concluded that there was a one-way causality relationship from the lopen variable toward the lgc variable. This result supports the LM cointegration test result. According to the results, as the openness rate increases, the government increases public expenditures to protect the people. In this respect, it was concluded that the compensation hypothesis was valid in the MIST countries in the 1960-2021 period. This result is similar to the results obtained by Cameron (1978), Rodrik (1998), and Tütüncü & Zengin (2019).

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ETİK ve BİLİMSEL İLKELER SORUMLULUK BEYANI

Bu çalışmanın tüm hazırlanma süreçlerinde etik kurallara ve bilimsel atıf gösterme ilkelerine riayet edildiğini yazar(lar) beyan eder. Aksi bir durumun tespiti halinde Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi'nin hiçbir sorumluluğu olmayıp, tüm sorumluluk makale yazarlarına aittir. Yazarlar etik kurul izni gerektiren çalışmalarda, izinle ilgili bilgileri (kurul adı, tarih ve sayı no) yöntem bölümünde ve ayrıca burada belirtmişlerdir.

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