

THE EFFECT OF THE PUBLIC EXPENDITURES ON THE ECONOMIC GROWTH IN TURKEY IN THE PERIOD 1980-2012

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Abstract

To what extent the state will have an impact on the market has been discussed for many years. The social state mentality, which emerged after the Great Economic Depression in 1929, has considered the level of impact on market in scope of the size of the public expenditures. There have been lots of studies and researches about the effect of the public expenditures on the economic growth. In order to find out this relationship, different kinds of techniques have been used. In this study particularly the educational, health, social security and justice expenditures and their long term impact on the economic growth in Turkey during the period between 1980 and 2012, has been examined. This relationship has been researched by using the Durbin-Watson, Granger and Johansen cointegration tests. At the end of the study, the empirical findings have showed that the educational, health, social security and justice expenditures, and fixed capital investments have affected found out the economic growth during the long term period. In addition to this, it has been determined that there are long term relationship between these variables.

Keywords: Public Expenditures, Economic Growth, Public Economy, Cointegration Test

INTRODUCTION

The state is an important part of economic life with the private sector. The tasks that are imposed to the state in the economic life, have increased and their scope has expanded over time. These tasks can be grouped under four headings as regulatory, policy creation, income redistribution and employers. The state, attempts to regulate the markets by making laws, creates policies by taking the decisions within the framework of economic policy, takes decisions providing justice for the society's income distribution and contributes to employment, as a major employer (Özdemir, 2007:31).

The task that is imposed to the state has become questionable with the 1929 economic crisis. According to the classical economic conception, when no intervention in the economy full employment will be provided in the long term, a crisis won't occur in the economy that may arise from the supply and demand imbalance and it will prevent the increase of the state's public expenditure and efficient use of resources and this will lead to loss of welfare thoughts were dominant. This mentality has also begun to change with the crisis. J. M. Keynes submits, overcome the crisis is possible with the way that is increasing the total demand and overcome this situation that is unemployment is high, is only possible with state's increasing the public expenditures. This economic political mentality has been accepted in many countries and rapidly increased the share of the state in the economy. There are a lot of hypotheses that explains both proportional and amount of increasing of the public expenditures. In this sense, the first explanation came from the German economist Adolph Wagner. According to Wagner, the duties to the state increase depending upon the economic growth and it causes increasing of the public expenditures. According to Alan Peacock and Jack Wiseman's Bounce Hypothesis the state's intervention increases to the economy in the economic crisis and it causes increasing of the public expenditures. After the crisis finished, the expenditures that become routines, have not decrease and have become permanent (Özdemir, 2007:41-42).

The changes of the social state mentality has also been a major cause of the increase of the share. Social state mentality rapidly adopted in the Western countries to filing the problems posed by the capitalist economic mentality, in order to reduce social reaction and the years 1945-1975 as the years lived in the golden age of the Social Welfare State mentality. The presence of the Eastern bloc that comprised of USSR and at their elbow the existence of these countries by an alternative to capitalism, has led Western countries to be more sensitive to social problems. In the existence of this situation, the competition of parties and the struggle of remaining in power has especially been effective (Duru, 2009:42).

In Turkey public expenditures are seen as having a significant effect on economic indicators. It has increased continuously in the share of public expenditure in the economy.

During the first years of Republic in GNP, the share of public expenditures were 10 %, in 2010 this share increased up to 39 %. In this study, especially in public expenditures in Turkey between of the 1980-2012, the long-term effects of expenditures of education, healthcare, social security, justice has been examined to economic growth. This relationship has been investigated by applying Durbin-Watson, Granger and Johansen Cointegration methods. In empirical results, it has been determined education, healthcare, social security and justice expenditures with fixed capital investment influenced economic growth in the long term and the existence of a long term relationship between these variables.

LITERATURE STUDY ON PUBLIC EXPENDITURES ECONOMIC GROWTH EFFECT

Gül and Yavuz (2011) examined the causal relationship between economic growth and public expenditures between the years 1963-2008 in Turkey, by using Unit Root Test, Cointegration Test and Granger Causality Test within the scope of the theory put forward by Wagner and Keynes. It has been researched the effects of public expenditures, transfer expenditures, prevalent expenditures and investment expenditures to economic growth. ADF Unit Root Test has showed cointegration between growth and expenditures. To the extend Granger Test, it has been found one-way causal relationship from public expenditures to economic growth. It has been reached similar results with studies of Konca (2011), Aktuna (2011), Boyes and et al (2007), Kneller (1998), Gül (2010), AyraçveGüran (2010), Altunç (2011).

In Deyneli (2011), it has been examined the effects of justice expenditures to economic growth between the years 1968-2009. It has been evaluated the relationship between justice expenditures and GDP by using Granger Causality Tests. In the analyze that is used private investment, defense expenditures by dependent variables and justice expenditures by explanatory variables in the research, it has not be find causal relationship between justice expenditures and GDP.

In Arısoy (2010), it has been embraced the relationship between education, healthcare, social security expenditures and economic growth in social expenditures between the years 1960-2005, by applied Lee and Chong's method. The analyses testing time series techniques were applied in three stages (unit root, cointegration, impulse-response analyses). In Unit Root Test Augmented Dickey-Fuller Test and Philips-Perpon Test, in Cointegration Test Johansen Juselius Test were applied. It has been determined; two-way causality between social expenditures and economic growth in the context of Granger, one-way causality from education, healthcare, social expenditures to economic growth. It has also been reached similar results by Kar and Taban (2003).

In Başar (2009), it has been examined the relationship between public expenditures in Turkey and economic growth by using the data between the years 1975-2005 with the Limit Test Approach. Within the scope of Wagner and Keynes approach, it has been analyzed public expenditures and lower levels (prevalent, investment, transfer expenditures). It has been found no relationship between prevalent, investment, transfer expenditures and economic growth, in this context it has been found Wagner approach was not valid in Turkey economy.

Bağdigen and Beşer (2009), within the scope of Wagner Thesis have examined causality relationship between economic growth and public expenditures in Turkey between the years 1950-2005. In their study, they have used causality analyze that improved by Hsiao and Toda Yamamoto. From this developed model, it has been gotten seven results and it has not been gotten any result that supports Wagner Thesis but one of them is bar.

Kwang (1987:293), in his study, has examined the optimal effect of public expenditures to economic growth. Public expenditures and the revenue need for the financing of this will effect public finance and it will require the redistribution of these expenditures. He has argued that increasing in public expenditures will generate distributional impacts on the finance of this and will generate excessive taxes burden on public. Thus, because of excessive increasing in public expenditures, it will be occur external costs in private goods consumption.

Blankenau and Simpson (2003), in their empirical study, have examined the effects of the education expenditures that are in public expenditures to economic growth. The level of correlation public expenditures depend on some specific parameters like tax structure and production technologies. In the context of endogenous economic growth, it express the relationship expense-growth with the model that is generated about the effects of private and public investments on human fund depot. In obtained empirical results, it express that the direct positive effects of public-education expenditures decreased on economic growth and even in time it effects negatively overall level of balance by creating a negative impact on other growth determinants. By indicating these results have a meant and education expenditures create uncertainty on economic growth that is at the macro level, it express that this situation would provide determining of the level of public education expenditures to eliminate created uncertainty in appropriate tax policies and these results would contribute to fertile economic growth.

In Bloom et al (2004), by using panel data method for the period 1960-1990 and by examining relative contribution's each of the available data, it has been examined the effects of public expenditures to economic growth. Within the scope of production function model, it has been tested the relationship between education and healthcare variables that is seen as a fundamental component of economic growth and human fund. For founded model, it is seen

that education and healthcare expenditures directly affect economic growth. According to the results healthcare expenditures effects are positive and statistically significant. On labor's and the hence the aggregate output's impact is quite large and statistically significant. When recovery happened for a year in healthcare expenditures, it is seen that population would contribute life expectancy with an increase of 4%. On the other hand, according to parameter estimates, increasing of education expenditures will generate externalities for human fund. On the other side, the relationship between education expenditures and economic growth is not meaningful with the average statistical data.

Özer (2010), in his study, has applied variance parsing, impulse-response analyses and Granger causality test to determine the relationship between healthcare, defense, education expenditures and economic growth in Turkey between the years 1984-2005. For determine the sensitivity of healthcare expenditures, it has been tested total healthcare expenditures, national income and population, growth rate variables with Johansen cointegration test. In the result of analyze it was found a significant interaction between healthcare expenditures and macroeconomic size variables statistics.

RESEARCH METHODOLOGY

Model and the Data

For the purpose of this study, following data is used: Consolidated Budget expenditures of the Republic of Turkey between 1980-2012, TUIK(Turkish Statistical Institute),Ministry of Finance, General Directorate of Budget and Fiscal Control, Presidency Strategy and Budget Presidency, State Planning Organization.

In the model that examines effects of public expenditures to economic growth, Y represents GDP growth rate, E represents education expenditures, S represents healthcare expenditures, SG represents social security expenditures, A represents justice expenditures and I represents fixed fund investments.

$$Y = \beta_0 + \beta_1 E + \beta_2 S + \beta_3 SG + \beta_4 A + \beta_5 I + v_t$$

The data that used in the analyses, are annual and are taken from the database of T.R. Ministry of Development, T.R. Ministry of Finance, Turkey Statistical Institute and The World Bank. The data are purified from inflation, are taken as percentage rate (per GDP ratio million TL). In the study that used annual data, Unit Root Test analyze has been applied for the stability of time series. In this stability analyze, it has been used Phillips-Perron (PP) Unit Root Test. In the model that has been examined the effects of public expenditures to economic growth in Turkey, cointegration analyses have been applied for examining the long period balance relationship between the variables.

Unit Root Test

The time series that will be used in analyze, must be stable. The time series that are not stable, could be stabled by getting decrease. If there is a unit root in the series in other words the series shows random walk, it is nonstable. The series that is gotten gradient first degree, after got gradient, this series is called stable from this gradient. Briefly, if it is stable after getting gradient (d) times, it is called (d.) degree integrated time series (Tari, 2002: 373-375).

Phillips-Perron (PP) Test becomes more appropriate in the situation that testing stability by taking into consideration refractions. The models used in Phillips-Perron (PP) Test are as follows (Perron, 1989: 1363-1364);

For zero hypothesis;

$$y_t = \mu + dD(TB)_t + y_{t-1} + \varepsilon_t \quad (1)$$

$$y_t = \mu + y_{t-1} + (\mu_2 - \mu_1)DU + \varepsilon_t \quad (2)$$

$$y_t = \mu + y_{t-1} + dD(TB)_t + (\mu_2 - \mu_1)DU + \varepsilon_t \quad (3)$$

In zero hypothesis if $t = T_B + 1$, it equals $D(TB)_t = 1$ (t represents time dimension, D is a coefficient). But if $t > T_B$, it equals $DU_t = 1$ and zero hypothesis that suggest unit root's existence, is been accepted and alternative hypothesis is been rejected. In this page, (1) number equation represents external refraction at the level of the series, (2) number equation represents external changes at the growth rate and (3) number equation represents both of refraction at the level value of the series and external changes at the growth rate.

When looked at the alternative hypothesis

$$y_t = \mu + \beta_1 t + (\mu_2 - \mu_1)DU + \varepsilon_t$$

$$y_t = \mu + \beta_1 t + (\beta_2 - \beta_1)DT_t^* + \varepsilon_t$$

$$y_t = \mu + \beta_1 t + (\mu_2 - \mu_1)DU + (\beta_2 - \beta_1)DT_t + \varepsilon_t$$

If $t > T_B$, it equals $DT_t^* = t - T_B$ and $DT_t = t$.

As seen above, T_B represents the changes of parameters that happens in trend function, in other words it shows the refraction. t represents time dimension. In alternative hypothesis, (1) number equation is called crash model. In unit root hypothesis, DU and DT represents dummy variables in changes of refraction parameter. $(\mu_2 - \mu_1)$ coefficients represent the change of trend function on fixed, $(\beta_2 - \beta_1)$ coefficients represent slope of the trend function (Perron, 1989: 1363-1365; Karanfil and Kılıç, 2015: 8-9).

Phillips-Perron Test uses the past values of the error terms by moving average (MA). In other words, in case of Phillips-Perron Test moving average process increases, it is taken in consideration structural refractions for trend stability.

In PP test, for the presence of unit root Augmented Dickey-Fuller models are given as follows;

$$\Delta Y_t = \alpha + \beta_1 + \theta D(T_B)_t + \delta DU_t + (\rho - 1)Y_{t-1} + \sum_{i=1}^k \rho_i \Delta Y_{t-i} + \varepsilon_t \quad (4)$$

$$\Delta Y_t = \alpha + \beta_1 + \delta DU_t + \gamma DT_t + (\rho - 1)Y_{t-1} + \sum_{i=1}^k \rho_i \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

$$\Delta Y_t = \alpha + \beta_1 + \theta D(T_B)_t + \delta DU_t + \gamma DT_t + (\rho - 1)Y_{t-1} + \sum_{i=1}^k \rho_i \Delta Y_{t-i} + \varepsilon_t \quad (6)$$

For the above models $\alpha_1 = 1$ statistics are compared with Peron's critical value. (γ) Value represents considered value. In unit root test, these statistics can change according to the refraction point by $\gamma = TB/T$. In the above model, T represents the number of observations, TB represents the refraction year, γ represents the position of the refraction point. For unit root test, if $t_{ai}(\gamma) < K_a(\gamma)$, zero hypothesis is been rejected and alternative hypothesis is been accepted. Therefore, in this case the series don't contain unit root, in other words becomes stable (Ümit, 2007: 166; Karanfil and Kılıç, 2015: 8-9).

In the analyze, for need of the series are at the same degree stable, firstly it has been examined the stability of series, it has been gotten first gradient of the series that is not stable in the level and Phillips-Perron Unit Root Test results are shown in table 1.

Table 1: Phillips-Perron Unit Root Test Results

Variables	Sheared		Sheared and Trended
	t-statistic	Critic Value	t-statistic
GDP	0.0601	-3.6537	-3.0736
ΔGDP	-5.9984	-3.6616*	-5.9608
EDUCATION	-2.2319	-3.6537	-2.1675
Δ EDUCATION	-5.1611	-3.6616*	-5.0637
HEALTHCARE	-2.1536	-3.6537	-2.1526
Δ HEALTHCAR.	-3.7901	-3.6616*	-3.3647
SOCIAL.SEC	-1.6756	-3.6537	-3.2385
Δ SOCIAL.SEC.	-11.6045	-3.6616*	-15.7691
JUSTICE	-0.9824	-3.6537	-1.1268
Δ JUSTICE	-6.4075	-3.6616*	-6.4856
INVESTMENTS	-2.6660	-3.6537	-2.6325
Δ INVESTMENT.	-6.4248	-3.6616*	-6.5785

* and *** symbols represent 1 % and 10 %. Δ symbol represents first gradient.

According to Phillips-Perron Unit Root Test results, it is seen the series that used in this study are not stable at the level value, become stable in the result of taking gradient. Thus, it is determined the series that is taken first gradients, became stable, and integrated in the first degree. As shown in table 1, in the result of sheared model and taking gradient according to the sheared and trended model, it is reached the results that unit root is removed and zero hypothesis is been rejected.

Cointegration Analyze

In the study, for examining the long term relationship between the nonstable variables, first Durbin-Watson, second Engle-Granger and last Johansen Approach have been used. In cointegration analyze, the effects of social welfare expenditures to economic growth have been examined.

Cointegration Regression Durbin-Watson (CRDW) Approach

It is one of the methods used in cointegration analyses put forward by Sargan and Bhargava, Durbin-Watson d statistic approach. In this approach, cointegration analyze is applied by determining basis Durbin-Watson d statistic approach. According to the level of significance 1%, 5% and 10% critical values are respectively 0.511, 0.386 and 0.322. Considered D statistic and the hypothesis are given as follows (Sevüktekin and Nargeleçekenler, 2010: 498-499);

$$d = (\varepsilon_t - \varepsilon_{t-1})^2 / (\varepsilon_t)^2 \quad (7)$$

H_0 : $d = 0$ (Error term is not stable, variables are not cointegrated)

H_1 : $d > 0$ (Error term is stable, variables are cointegrated)

Table 2: Cointegration Regression Durbin-Watson Results

Non-Trended	Critic values*	Trended
Durbin-Watson d statistic		Durbin-Watson d statistic
1.293	0.511*	0.804

* Critic values represent 1 %.

The results about Durbin-Watson d statistic are given in table 2. According to the results, $d=1.293$ and $d=0.804$ values exceed the critic values at the each of the three percentage level. Therefore zero hypothesis is rejected and the alternative hypothesis is accepted. In other words, error terms have not taken a value close to zero, have taken a value over of the critical value, and alternative hypothesis have been accepted. Therefore as shown in table 2 according to Durbin-Watson d statistic approach, it can be said the variables are cointegrated in long-term.

Engle-Granger Approach

After Durbin-Watson d statistic approach, the relationship between Engle-Granger Approach and cointegrations have been researched. In Engle-Granger Approach, the long term relationship with the ordinary least squares method, is estimated as in the equation (8).

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \dots + \beta_k X_{kt} + \varepsilon_t \quad (8)$$

In (8) number equation Y_t and $X_{1t}, X_{2t}, \dots, X_{kt}$ represent variables as integrated from the first degree. Considering the variables are integrated, represents that error term ε_t is stable. Therefore, if the error term is stable at the level value, variables will be cointegrated. The equation used for the stability of the error term is given in the equation (9).

$$\Delta \varepsilon_t = \delta \varepsilon_{t-1} + v_t \quad (9)$$

After variables have been considered cointegrated, estimated error correcting model and the hypothesis are the following (Sevüktekin and Nargeleçekenler, 2010: 485-493; Yıldızve Berber, 2008:174);

$$\Delta Y_t = \text{Delayed} (\Delta Y_t, \Delta Y_{1t}, \Delta Y_{2t}, \dots, \Delta Y_{kt}) + \lambda(\varepsilon_{t-1}) + v_t \quad (10)$$

$H_0 : \delta = 0$ (if $t_\delta > \tau$, ε_t is not stable, there is no cointegration)

$H_1 : \delta < 0$ (if $t_\delta < \tau$, ε_t is stable, there is the cointegration)

Engle-Granger Approach results that give the relationship between economic growth, education expenditures, healthcare expenditures, social security expenditures, justice expenditures and fixed fund investments in long term, are shown in table 3.

Table 3: Engle-Granger Cointegration Test Results

Variable	Test Statistic	Critic Values
		-2.639210*
V_t	-4.506815	-1.951687**
		-1.610579***

*, **, and *** symbols respectively represent 1 %, 5 % and 10 %.

According to the results of table 2 and table 3, in both Durbin-Watson Approach and Engle-Granger Approach there is a relationship between public expenditures and economic growth in long term. In other words, these variables are cointegrated, in long term these variables become balanced can be said.

Johansen Cointegration Method

Cointegration test indicate relationship between the variables in long term, in other words indicates coming to balance of these variables. When there were more than two variables, it

appears a possibility that more than one integrated vector (Kennedy, 2006, Sevüktekin and Nargeleçekenler, 2010). In this context, in the model finally Johansen cointegration model has been applied for examining the relationship between the nonstable variables, by taking into account the possibility of more than on integrated vector. In Johansen cointegration approach, the most common form of the variables in the model, is formed as in the equation (11).

$$Y_t = X_1 Y_{t-1} + X_2 Y_{t-2} + \dots + X_k Y_{t-k} + \varepsilon_t \quad (11)$$

With taking gradient,

$$\text{For } \Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \dots + \Gamma_{k-1} \Delta Y_{t-k+1} + \Pi Y_{t-1} + \varepsilon_t \quad (12)$$

$$i = 1, 2, 3, \dots, k-1$$

It is represented as

$$\Gamma_i = - (I - X_1 - X_2 - \dots - X_i) \quad \text{and} \quad \Pi = - (I - X_1 - X_2 - \dots - X_i).$$

Π parameter represents a coefficient of the relationship in long term. According to this parameter characteristic root of Π matrix is considered. Shortly it is shown as under.

- Rank (Π) = 0 → There is no cointegration,
- Rank (Π) = 1 → There is a cointegration,
- Rank (Π) > 1 → There are more than one cointegration.

After Π matrix characteristic root calculation, as to whether of cointegration is decided by using (λ_{iz}) trace and (λ_{max}) maximum eigenvalues statistics. The statistics are calculated as follows;

$$\lambda_{iz}(r) = -T \ln(1 - \lambda_i) \quad \text{and} \quad \lambda_{max}(r, r+1) = -T \ln(1 - \lambda_{r+1})$$

Here, T represents the number of observation, r represents Π parameter's rank, m represents the number of variables in the model, λ_i represents Π parameter's estimated characteristic roots and λ_{r+1} represents eigenvalue statistic's estimations. Hypothesis for statistics are shown as under;

(λ_{iz}) statistic;

- | | |
|--------------------|------------------|
| $H_0: r = 0,$ | $H_1: r \geq 1,$ |
| $H_0: r \leq 1,$ | $H_1: r \geq 2,$ |
| | |
| $H_0: r \leq m-1,$ | $H_1: r \geq m,$ |

(λ_{max}) statistic;

- | | |
|--------------------|---------------|
| $H_0: r = 0,$ | $H_1: r = 1,$ |
| $H_0: r \leq 1,$ | $H_1: r = 2,$ |
| | |
| $H_0: r \leq m-1,$ | $H_1: r = m.$ |

If trace (λ_{iz}) and maximum eigenvalue (λ_{max}) statistics are more than critic values, zero hypothesis is rejected and alternative hypothesis is accepted. Thus, it is reached to the result

that the variables are cointegration (Enders, 1995; Sevüktekin and Nargeleçekenler, 2010). Johansen cointegration results are shown as in Table 4.

Table 4: Johansen Cointegration Test Results

Maximum Eigenvalue Test				Trace Test		
H ₀	H ₁	Test Statistic	5 % Critic Value	H ₀	H ₁	Test Statistic
$r = 0$	$r = 0$	92.54	44.49	$r = 0$	$r \geq 0$	205.45
$r \leq 1$	$r = 1$	40.66	38.33	$r \leq 1$	$r \geq 1$	112.91
$r \leq 2$	$r = 2$	30.41	32.11	$r \leq 2$	$r \geq 2$	72.24

EMPIRICAL EVIDENCE AND EVALUATION

With Phillips-Perron unit root test, showing random walks of the series are tested. Random walk process is important for testing the relationship between the variables in long term. In the result of unit root test, it is identified that the series absorbs unit root at the level value. For absorbing unit root means nonstable, the transaction of taking gradient is applied and is tested again. After the result of taking gradient, it is seen that the variables become stable. Hence, for these variables show random walk, the existence of relationship in long term is tested by cointegration test.

When looked to the result of Johansen cointegration approach, according to the both (λ_{max}) maximum eigenvalue and (λ_{iz}) trace test statistics, it is seen the variables that become stable in first gradient is cointegrated. Briefly, according to cointegration test, the relationships between economic growth, education expenditures, healthcare expenditures, social security expenditures, justice expenditures and fixed fund investments in long term, are identified. Therefore, according to the obtained findings, it is reached to the results that develop the studies of Gül and Yavuz (2011), Boyes et al. (2007), Kneller (1998:171) and Gül (2010) in literature.

CONCLUSION

It is known public expenditures have a significant impact to economic growth. Especially with the effects of social state mentality, important increasing happens in public expenditures. Within the scope of this approach, it is seen that increased public expenditures in recent years in Turkey have a dynamic effect on economic growth. In turkey between the years 1988-2012, the relationships between public expenditures and variables under of this justice expenditures, education expenditures, healthcare expenditures, social security expenditures and fixed fund

investments and economic growth, have been examined with different analyze methods and it has reached to some empirical results. Within the scope of Engle-Granger cointegration relationship analyses, there is a relationship between education, healthcare, social security, justice expenditures and fixed fund investments and economic growth in long term, and they become on balance together. The effects of the same expenditures on economic growth, are tested with Johansen cointegration test and here it is determined that the relationship between them in long term.

According to Durbin-Watson d statistic approach, in cointegration analyze it is seen that the variables are cointegrated in long term. In the result of the long term togetherness relationship between the variables, the increases and decreases of the social welfare expenditures can be effective on GDP and hence the economic growth. Shortly, according to the each three cointegration analyses the relationship is identified. Therefore, it is indicated that period public expenditures in Turkey for a period are effected by economic growth as in Wagner hypothesis. Likewise, without directly identified a causal direction, it is reached to the result that the increases of the public expenditures contribute to the economic growth.

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