

# GLOBALISATION AND THE SIZE OF THE PUBLIC SECTOR IN THE CONTEXT OF THE REGIME CHANGE APPROACH: THE CASE OF TÜRKİYE

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## Abstract

The size of the public sector in the economy is closely related to globalization. It aims to maximize welfare. There are two main hypotheses (efficiency and compensation) discussed in the literature on this relationship. Both hypotheses discuss the relationship between globalization and government size in terms of (i) the impact of globalization on public employment, (ii) the impact of globalization on public revenues, and (iii) the impact of globalization on public expenditure. Global and national economies are not static and periodically expand or contract. The main hypothesis of this study is that the validity of the efficiency and compensation hypothesis in economies varies according to expansion and contraction periods. In terms of financial and commercial globalization, this change is also differentiated. The results of this study, which is specific to Turkey, show that trade globalization has a positive effect on public employment and public expenditures within the scope of the compensation hypothesis, while the efficiency hypothesis is confirmed in the relationship between tax revenues and financial globalization. These results are exemplary for transition and developing countries in particular.

**Keywords:** globalization, trade openness, public sector size, efficiency, compensations, regime-switching.

## 1. Introduction

The concept of globalization, which is treated in this study in its economic dimension, can be briefly defined as the liberalization of trade, capital, and labor flows (Bhandari and Heshmati, 2005). In terms of process, Williamson (2002) defines globalization as the first globalization period 1870–1913, the second globalization period 1913–1950, the third globalization period 1950–1973, and the fourth globalization period after 1973. Subramanian and Kessler (2013) added a fifth period, 1990–2000, and called this last period ‘hyper-globalization’. The global economy promises greater prosperity through the channels of comparative advantage, division of labor, and specialization as markets grow worldwide (Rodrik, 2007). Globalization affects the economic, social, political, and financial structures of countries and globalization produces winners and losers of its own process (Autor *et al.*, 2020). The size of the public sector in the economy is closely related to globalization, as the existence of winners and losers in the economy is intimately related to welfare. The literature discusses government intervention in the economy in the process of globalization according to two opposing hypotheses. The first is the ‘efficiency hypothesis’ and the second is the ‘compensation hypothesis’.

The world experienced a financial crisis in 2008 and an economic crisis with a pandemic phase that began in 2019 and lasted for two years, following a period of hyper-globalization. In both periods, there has undoubtedly been a demand for expansion of state interventions in the economy. This situation has led to the need to rethink the relationship between globalization and the size of the public sector. Although the crises of 2008 and 2009 affected all the world’s economies, the response of national economies to the crises may be subjectively different. Economic variables fluctuate during these periods of expansion and contraction. The main hypothesis of this study is that the relationship between globalization and public sector size may differ in contraction and expansion periods, the relevance of the efficiency and compensation hypothesis may change between periods of expansion and contraction. This is the first study to examine the compensation and efficiency hypothesis approaches in the context of expansion and contraction periods.

This study aims to reconsider the effects of globalization on the size of the public sector according to contraction and expansion periods and analyses the policies implemented.

As an OECD and G20 member country with a state-dominated dual economy until the early 1980s and a per capita national income of USD 11,938 in 2023, Turkey’s past experience is important for transition and emerging economies. The results and policy recommendations can also serve as an example for transition and developing countries.

The remaining sections are structured as follows: section two discusses the efficiency and compensation hypotheses and presents the literature review; section three describes the methodology and data; section four presents the empirical results; and finally, section five presents the conclusions and policy implications.

## **2. Globalization and public sector growth in the context of efficiency and compensation hypotheses: A literature review**

The relationship between globalization and the size of government is discussed in terms of (i) the impact of globalization on public employment, (ii) the impact of globalization on public revenues (taxes), and (iii) the impact of globalization on public expenditure. The proposition that public sector activity is constrained as economies become more open is central to the efficiency hypothesis. The reason for the decreasing share of the public sector in the economy is that the private sector needs more space for its commercial activities and to compete (Gangopadhyay *et al.*, 2021). The race to the bottom, which increases with competition in the economy, is the main starting point of the efficiency hypothesis (Lammers *et al.*, 2018). Governments seeking to prevent capital flight by opening up to foreign markets try to do so by lowering tax rates and reducing labor market regulations. Decreasing tax revenues with a lower tax burden on the private sector reduces public spending and thus public employment (Gangopadhyay *et al.*, 2021). The liberalization and privatization of labor, capital, and product markets, with increased competition and the aim of raising productivity on a global scale, also enhance the vulnerability of economies to external shocks, risks, and economic uncertainties (Buchholz *et al.*, 2009).

The ‘compensation hypothesis’ is based on the growing risks and uncertainties and associated losers in the globalization process. Cameron (1978) explains the increase in the share of the public sector in the economy (which includes the share of public employment in total employment) due to the openness of the economy to the outside world with the tendency to encourage unionization and collective bargaining due to the high industrial concentration in open economies. Rodrik (1998) found that in economies open to international competition, the external risk created by globalization increases the volatility of domestic income and consumption, and hence unemployment. The state assumes the role of mitigating this risk through social security and welfare spending. Pressure from individuals demanding protection from the social dilemmas and economic insecurity caused by globalization is driving the increase in public spending (Garrett, 2001).

As international competition increases with globalization, exposing economies to international economic forces, this situation leads individuals to demand risk compensation for possible unemployment and income loss, and governments to try to respond to this demand by providing broader safety nets through social programs or public employment (Rodrik, 2011). As a result, changes in the openness of countries lead to an increase in employment incentives through fiscal policy (Epifani and Gancia, 2008).

Thus, the state provides an income transfer against risks in the form of social insurance through the employment it creates (Garen and Trask, 2005). In open economies, the share of the public sector in the economy can increase, both in terms of expenditure and public employment and this increase leads to a rise in public revenues for governments through taxes (Jha and Mukherjee, 2023).

The size of the public sector is represented by public expenditure, public revenue, and public employment according to the efficiency and compensation hypothesis. This study

analyses the literature within the framework of these three variables, unlike other studies. In the analysis, public revenues representing the size of the public sector are expressed by the variables tax revenues, total public revenues, corporate tax revenues, capital tax rate, average effective tax rate, and implicit tax rate. The variables general government expenditure, central government expenditure, total government expenditure (by function), government consumption, and social expenditure are used to express public expenditure, which represents the size of the public sector.

In a limited number of studies, the relationship between public employment and globalization has been expressed by unemployment benefits, employment protection legislation (Riekhoff, 2020), social welfare expenditures, and total public employment variables.

In this context, unlike other studies, this study analyses and tabulates the related literature regarding the variables used to represent the size of the public sector. Table 1 shows that studies have examined the relations between the public sector size and globalization in the context of public revenue, using different variables, countries, and time periods. The results obtained in the studies mainly confirm the compensation hypothesis (Cameron, 1978; Bernauer and Achini, 2000; Garret and Mitchell, 2001; Adsera and Boix, 2002; Dreher, 2006; Onaran and Boesch, 2014; Jha and Gözgör, 2019; Bachas *et al.*, 2022). Quinn (1997) and Heinemann (2000) confirm the efficiency hypothesis and find that globalization reduces capital and corporate tax revenues and tax rates.

The studies in Table 2, where the compensation and efficiency hypotheses are analyzed within the scope of the public expenditure dependent variable, predominantly confirm the compensation hypothesis (Rodrik, 1998; Alesina and Wacziarg, 1998; Bernauer and Achini, 2000; Shelton, 2007; Epifani and Gancia, 2008; Kimakova, 2009; Shonchoy, 2016; Kim *et al.*, 2018; Anderson and Obeng, 2021; Kim and Lee, 2021; Bharati *et al.*, 2023). In support of the compensation hypothesis, I find that there is a positive empirical relationship between globalization and the size of the public sector. In contrast, Kittel and Winner (2005) and Garrett (2001) found no relationship between the variables, while Liberati (2007) found a negative empirical relationship between trade openness and total public expenditure. However, the other main factor affected by globalization is that of those losing out: the unemployed. Governments face a fundamental conflict in the process of globalization: trying to combine higher average incomes with higher unemployment (Egger and Kreckemeier, 2009).

Indeed, according to Minsky (2008), flexible labor demand is needed to prevent economic instability and unemployment, and this is only possible through non-profit public sector employment. Increased international competition due to globalization exposes economies to international economic forces. This, in turn, leads individuals to demand risk compensation for unemployment and income losses, and governments to try to respond to this demand by building broader safety nets through social programs or public employment (Rodrik, 2011). As a result, changes in the openness of countries lead to an increase in employment incentives through fiscal policies (Epifani and Gancia, 2008). To achieve this, governments are increasing spending on social security, social welfare,

Table 1: The relationship between globalization and public sector size: Public revenue as a dependent variable

Study	Country Sample	Years	Variables (Government size measure – Globalization measure)	Econometric Method	Result
Cameron (1978)	18 countries	1960–1975	Government's revenue as a % of GDP, import and export as a % of GDP	OLS	Positive correlation between government revenue and globalization (+)
Quinn (1997)	OECD, emerging market economies	1960–1989	Corporate taxation as a % of total taxation, corporate taxation revenue as a % of GDP, Openness	Cross-section regressions	Globalization reduced the capital taxation (-)
Bernaier and Achini (2000)	OECD and non-OECD countries	1960–1994	Tax Revenues as a % of GNP, Trade as a % of GNP	OLS	+
Heinemann (2000)	21 OECD countries	1970–1997	Corporate tax as a % of total taxation and taxes on goods and services as a % of total taxation, The sum of exports	Cluster analysis	-
Garret and Mitchell (2001)	18 countries	1962–1991	Capital Tax Rate, FDI	Panel Reg.	+
Adsera and Boix (2002)	65 developed and developing countries	1950–1990	Public revenue as % of GDP, Export concentration, Volatility in terms of trade	Panel Reg.	+
Dreher (2006)	30 OECD countries	1970–2000	Average effective tax rates on labor, consumption, and capital, Index of globalization	OLS, GMM	+
Onaran and Boesch (2014)	15 EU countries, 13 OEE countries	1970–2007	Implicit tax rates on capital, labor, and consumption, KOF	Dynamic Panel	+
Jha and Gozgor (2019)	155 countries	1970–2015	The index of the top marginal income tax rate, KOF	Panel reg.	+
Bachas et al. (2022)	150 countries	1965–2018	Tax revenues, effective tax rates on capital and labor, Trade openness	Panel reg.	+

Source: Consolidated by the author

Table 2: The relationship between globalization and public sector size: Public expenditure as a dependent variable

Study	Country Sample	Years	Variables (Government size measure – Globalization measure)	Econometric Method	Result
Rodrik (1998)	23 OECD countries	1990–1992 1985–1983	Total government expenditure as a % of GDP, Openness (M+XY)	Regression	Positive empirical relationship between trade openness and government expenditure (+)
Alesina and Wacziarg (1998)	137 developed and developing countries	1980–1984 1985–1989	Government consumption, education, defense and investment, trade openness	OLS	+
Bernauer and Achini (2000)	OECD and non-OECD countries	1960–1994	Government expenditure as a % of GNP, Trade as a % of GNP	OLS	+
Garret (2001)	131 developed and developing countries	1985–1995	Government expenditure, General government consumption the sum of exports and imports as a % of GDP	OLS	No evidence
Kittel and Winner (2005)	17 countries	1963–1991	Government expenditure as a % of GDP, FDI	Pooled OLS	No effect
Shelton (2007)	100 countries	1970–2000	Central and general public expenditure, Openness	Panel Reg.	+
Liberati (2007)	20 OECD countries	1970–2003	Government expenditure as a % of GDP, Openness, FDI	Pooled OLS	Negative empirical relationship between trade openness and government expenditure (-)
Epifani and Gracia (2008)	143 countries	1950–2000	Government expenditure as a % of GDP, Openness	Panel Reg.	+
Kimakova (2009)	87 countries	1980–1999	Government consumption as a % of GDP, International trade as a % of GDP	Panel Reg.	+
Shonchoy (2016)	97 developing countries	1984–2004	Final consumption expenditure as a % of GDP, the sum of exports and imports of goods and services measured as a % of GDP		+
Kim et al. (2018)	53 developed and developing countries	1980–2011	Government expenditure, Tax Revenue, Government debt, Openness	Panel cointegration	+
Anderson and Obeng (2020)	24 OECD and 113 non-OECD countries	1972–2014	Welfare expenditure, Consumption expenditure, and KOF ( <i>de facto</i> and <i>de jure</i> )	Panel Reg.	<i>De jure</i> trade globalization tended to raise consumption expenditure
Kim and Lee (2021)	15 OECD countries	1981–1998	Total government expenditure as a % of GDP, Openness	OLS	+
Bharati et al. (2023)	137 countries	2000–2016	General government expenditure as a % of GDP, KOF goods trade as a % of GDP, KOF	Panel Reg.	+

Source: Consolidated by the author

protective labor market policies, investing in human development and education, and providing unemployment benefits (Lammers *et al.*, 2018). The empirical literature mainly deals with the size of the state in terms of the impact of globalization on unemployment benefits, employment protection legislation (Riekhoff, 2020), and social welfare expenditures (Liberati, 2007; Epifani and Ganci, 2008). Rodrik (1998) used a different approach and found that public employment (as a share of the total labor force) is positively related to openness as a proxy for the size of government. Against risks, the state provides an income transfer in terms of social insurance with the employment it creates (Garen and Trask, 2005) and the share of the public sector in the economy may increase in terms of both expenditures and public employment in open economies. The study by Gözgör *et al.* (2019), which examined 92 developing countries between 2000 and 2016 using panel data analysis, found a positive relationship between the share of public employment out of total employment and economic globalization. In fact, to tackle unemployment after the 2008 economic crisis, the European Commission announced that employment in the public sector should be increased as a measure in the labor market policies of the EU-27 countries (Ministry of Development, 2014).

In the literature, the results of the studies examining the relationship between globalization and public sector growth vary according to the method, econometric model, variables used, country, and period. In this respect, it can be said that panel data are predominantly used to test the compensation and efficiency hypotheses. The literature has progressed by generalizing the hypotheses and is quite limited in terms of single-country examples. However, as stated by Swank (2002), the effects of globalization depend on national institutional characteristics. In this context, focusing on single-country studies to evaluate hypotheses would be an important contribution to the literature. Indeed, in order to fill this gap in the literature, this study examines the relationship between globalization and the size of the public sector in Turkey as a single country sample.

### **3. Data and methodology**

#### **3.1. Data**

This study aims to examine the relationship between globalization and public sector size in Turkey across different regimes (contraction and expansion). Turkey, which had a state-dominated dual economy until the early 1980s, began to open up to trade and finance as part of globalization in the early 1980s. In the context of liberalization of goods and services, capital and money markets have gathered pace since 1984. While trade globalization dominated in the early 1980s, financial globalization began to gain momentum in the late 1980s. Privatization proceeds from liberalization policies reached an all-time high of USD 12,485,548,323 in 2013 during and after the period of ‘hyper-globalization’. In this context, Turkey is an important example for transition economies in its own period and afterward. Due to the changing structure and weights over time, this study, unlike

others, considers globalization separately within the trade and financial globalization variables. In this context, using monthly data between 2000 and 2023(2), covering the period of ‘hyper-globalization’, this study examines the relationship between globalization and the size of the public sector in Turkey. Three different MS-VAR models were estimated using three dependent variables (public expenditure, tax revenue, and public employment) representing the size of the public sector.

**Table 3:** Description of variables

Variables	Representation	Source
emp	Public employment	Republic of Türkiye, Ministry of Treasury and Finance (T.C.H.M.B.)
exp	Central Government expenditure per capita	T.C.H.M.B.
tax	Tax revenue per capita	T.C.H.M.B.
trade	Total trade per capita	Central Bank of Türkiye Republic (T.C.M.B.)
fdi	Foreign direct investment per capita	T.C.M.B.
inf	Inflation	T.C.M.B.
gepu	Global economic policy uncertainty	<a href="https://www.policyuncertainty.com/global_monthly.html">https://www.policyuncertainty.com/global_monthly.html</a>

In the study, where public sector growth is represented by the dependent variables public employment (model 1), public expenditure (model 2), and tax revenue (model 3), three different models were estimated. The estimation uses total trade per capita, representing trade globalization, and FDI per capita, representing financial globalization, which are sub-components of economic globalization, as explanatory variables. The choice of variables is in line with the suggestion of Bernauer and Achini (2000) to consider financial and trade openness separately in integration studies. The variables selected are sub-components of the globalization index (Potrafke, 2015). Thus, it was possible to evaluate economic globalization as financial and trade globalization (Gygli *et al.*, 2019). As control variables, inflation and the Global Economic Policy Uncertainty Index were also included in the study. The high level of inflation in Turkey, especially since 2016, has been effective in its use as an explanatory variable. The Global Policy Uncertainty Index was used as a control variable in the model due to the fact that more market integration leads to more uncertainty (Hellwig, 2007) and its impact on public spending (Nguyen *et al.*, 2020).

### **3.2. Markov Switching Model**

The focus of the relevant literature has been on panel data analysis, and the existence of the compensation and efficiency hypotheses have mainly been tested through panel regression estimation, as discussed in the second part of the study. The studies carried out in this context have ignored the time dimension problems of pooled data arising from non-stationary data (Kittel and Winner, 2005). Therefore, the cyclical behavior in the periods when the compensation and efficiency hypotheses were tested could not be included in the estimations. However, the relationship between variables may change due to shocks

(Gong *et al.*, 2021). As Hamilton (1990) pointed out in his study, economic variables in general have time-dependent dynamics and fluctuate during the expansion and contraction phases of a business cycle. The Markov Switching VAR (MSVAR) model used in this study differs from other studies in that the regime switching model allows different states of the economy to be modeled (Chen *et al.*, 2022). The MS-VAR model adapted to dynamic multivariate systems in Krolzig (2000, 2006)

$$y = \mu(s_t) + A_1(s_t)y_{t-1} + \dots + A_p(s_t)y_{t-p} + u, \quad u_t | s_t \sim NID(0, \Sigma_{s_t})$$

The graphs of the variables used in three different MS-VAR models are given below.

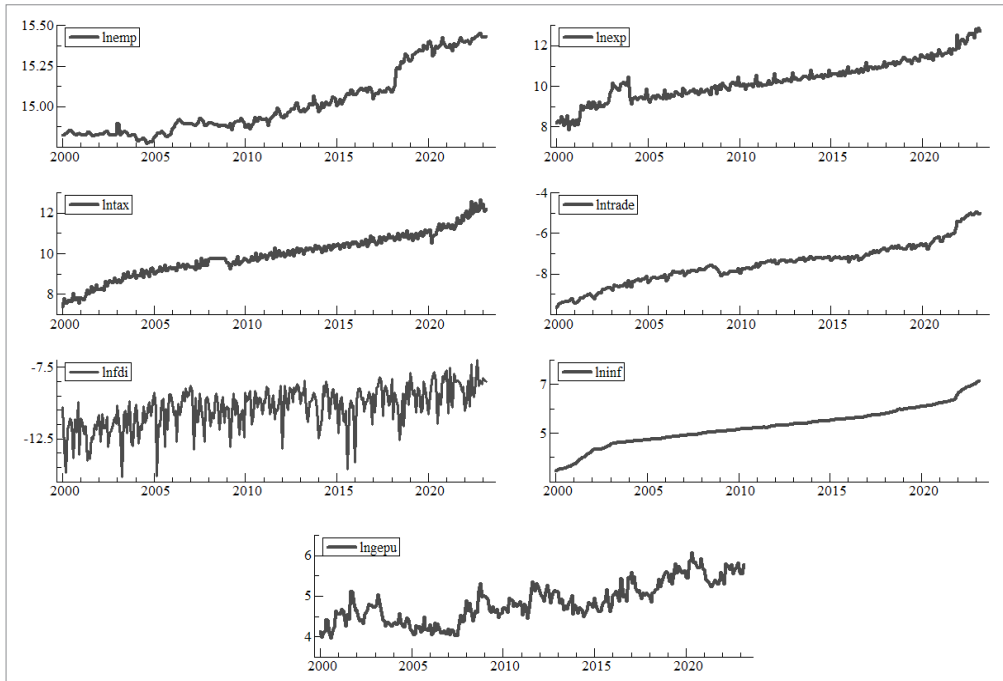


Figure 1: Fluctuations of the series at the level I(0)

Source: Author's calculations

When the series in Figure 1 are analyzed, it is observed that the highest volatility is observed in foreign direct investments (FDI) and the global economic political uncertainty index (gepu).

Figure 2 shows that all series tend to fluctuate more in the period 2000–2023.

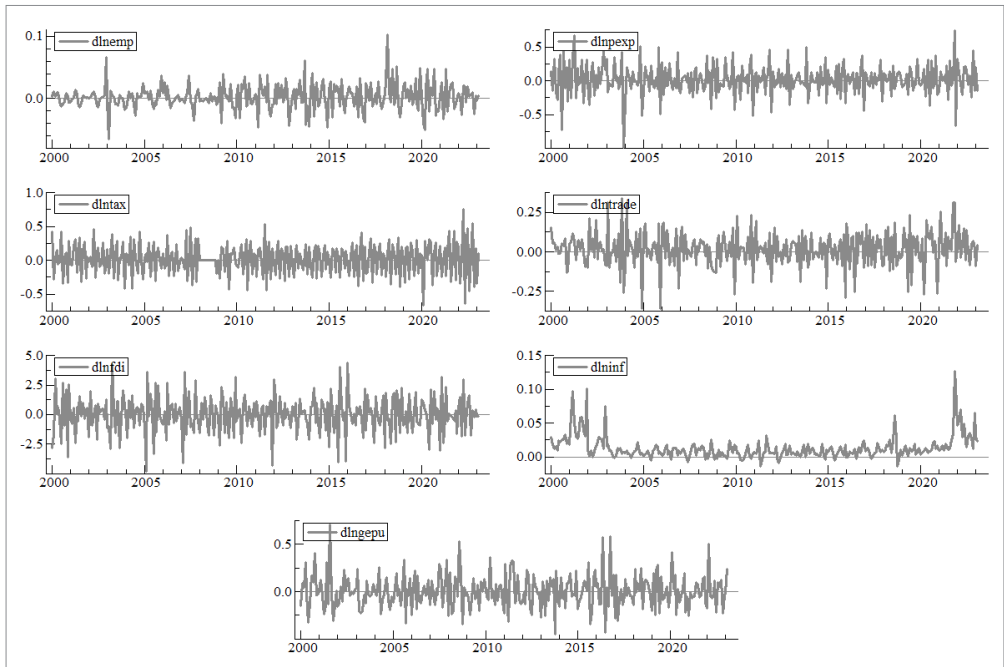


Figure 2: Time series change rate

Source: Author's calculations

#### 4. Empirical results

This stage of the application first analyses whether the variables have a unit root. Table 4 shows the results of the Augmented Dickey Fuller and Phillips-Perron tests. These results indicate that all series contain a unit root in the constant and that the variables are non-stationary. All variables' first differences are stationary at the 5% significance level. The series may be affected by changes in the lower periods due to structural breaks in the constant and/or slope parameters (Perron, 1989). Bai and Perron (1998, 2003) recommend a multiple-unit root test to detect these structural breaks. When the time of the break is unknown, the Bai and Perron (1998, 2003) analysis allows for the identification of the number of breaks and each break from specific to general. The results obtained from the Bai and Perron (1998, 2003) analysis will be important in determining the expansion and contraction periods in the regime-switching model.

The results of the multiple structural break test are presented in Table 5. Although structural breaks in the series used for estimation occurred at different dates, we can say that 2006, 2008, 2012, 2016, 2018, and 2019 are common break periods. The years 2008 and 2019 coincide with the financial crisis in the global economy and the period of global contraction during the pandemic period, while the other years overlap with the crises experienced by the Turkish economy (such as the currency crisis in 2018). These dates can

Table 4: Stationarity tests

Variable	ADF statistics (level)	MacKinnon 5% critical value	PP statistics (level)	MacKinnon 5% critical value
Intax	-0.518022	-2.872244	-1.396762	-2.871731
Inpexp	-0.544234	-2.872203	-0.919223	-2.871731
Inemp	0.667095	-2.871806	0.640943	-2.871731
Intrade	0.667951	-2.872001	0.374436	-2.871546
Infdi	-2.365354	-2.871768	0.598012	-2.871546
Ininf	0.014870	-2.871845	-0.157333	-2.871731
Ingepu	-2.480524	-2.871768	-2.004572	-2.871731

Variable	ADF statistics (first degree difference)	MacKinnon 5% critical value	PP statistics (first degree difference)	MacKinnon 5% critical value
$\Delta$ Intax	-4.089536*	-2.872244	-53.95937*	-2.871768
$\Delta$ Inpexp	-4.938489*	-2.872203	-33.01234*	-2.871768
$\Delta$ Inemp	-14.80757*	-2.871806	-18.82843*	-2.871768
$\Delta$ Intrade	-3.923601*	-2.872001	-26.32435*	-2.871582
$\Delta$ Infdi	-12.39087*	-2.871768	-161.7877	-2.871582
$\Delta$ Ininf	-5.041834*	-2.871845	-9.020409*	-2.871768
$\Delta$ Ingepu	-14.82615*	-2.871806	-25.67967	-2.871768

Note: \*\*\*Significant at 10%, \*\* Significant at 5%, \* Significant at 1%

Source: Author's calculations

be characterized as contraction periods when Turkey experienced significant declines in terms of economic growth.

The structural break test showed that there are multiple structural breaks in the series used in the model. An important solution to overcome structural break problems is to incorporate regime-switching dynamics into the vector autoregressive (VAR) model. The characteristics of the MS-VAR model allow for the inclusion of different states of the economy in the model (Chen *et al.*, 2022). In the next stage of the study, the first order

Table 5: Bai and Perron (1998, 2003), Multiple Structural Break Test Results

	Intax	Inpexp	Inemp	Intrade	Infdi	Ininf	Ingepu
$UD_{max}$	192.0746	94.32561	189.1441	103.9815	90.15059	13.41541	138.7194
Critical Value**	8.88	8.88	8.88	8.88	8.88	8.88	8.88
$WD_{max}$	421.4835	206.9856	373.1435	228.1742	107.1319	13.41541	199.7001
Critical Value**	9.91	9.91	9.91	9.91	9.91	9.91	9.91
Estimated Number of Breaks	5	5	3	5	2	1	3
	$\hat{T}1=2006M05$	$\hat{T}1=2003M05$	$\hat{T}1=2006M01$	$\hat{T}1=2003M06$	$\hat{T}1=2004M05$	$\hat{T}1=2011M10$	$\hat{T}1=2003M06$
	$\hat{T}2=2007M4$	$\hat{T}2=2008M06$	$\hat{T}2=2012M06$	$\hat{T}2=2007M02$	$\hat{T}2=2018M09$		$\hat{T}2=2007M12$
	$\hat{T}3=2011M04$	$\hat{T}3=2012M11$	$\hat{T}3=2018M03$	$\hat{T}3=2011M02$			$\hat{T}3=2018M06$
	$\hat{T}4=2015M09$	$\hat{T}4=2016M05$		$\hat{T}4=2016M08$			
	$\hat{T}5=2019M10$	$\hat{T}5=2019M10$		$\hat{T}5=2020M02$			

\*Significant at the 0.05 level, \*\* Bai and Perron (2003) critical value

Source: Author's calculations

difference of the variables (dlntax, dlnextp, dlnextp, dlnttrade, dlntfdi, dlntinf, dlntgepu) that were found to contain structural breaks were tested with the MS-VAR model.

#### 4.1. Model estimation

Using the information criteria in the MS-VAR, the most appropriate model was estimated. The model composed of the two regimes with the lowest value of the AIC criterion and the highest value of the log-likelihood is determined. Information criteria such as SC and HQ are used to determine the lag length. For the SC and HQ information criteria, the 2 lag model was selected for the three models. The MS(2) VAR(2) model was identified for all three models.

Looking at the diagnostic tests of three different MS(2) VAR(2) models estimated within the framework of dependent variables (dlnextp, dlnextp, dlntax), we see that all 3 models are robust (see Table 6). In order to determine the regimes of all three robust models, the classification of regimes was conducted based on the smoothed probabilities (see Table 7). Using this classification, the regime distribution data (see Table 6) are evaluated together with the data obtained using the Bai and Perron (1998, 2003) structural break test. Together with the results of the MS(2)-VAR(2) model, it is advisable to consider Regime 1 as an expansionary period and Regime 2 as a contractionary period, as well as global and national economic growth data.

**Table 6:** Diagnostic tests

	Model 1	Model 2	Model 3
Linearty LR Test	4670.4**	4695.3**	4751.2**
Davies	0.0000**	0.0000**	0.0000**
Normality	122.46**	137.58**	32.244**
ARCH 1-1 test	2.1110***	2.92919**	1.6562***
Portmanteau(36)	1381.2**	1373.2**	1732.1**

Source: Author's calculations

The significance of the relationship between the three dependent variables representing the size of the public sector and the explanatory variables varies according to the expansion and contraction periods.

In MS(2)VAR(2) smoothed probability estimates of three models, the dark grey regions are the periods when the smoothed probability of the expansion regime is at the maximum, and the light grey regions are the periods when the smoothed probability of the contraction regime is at the maximum. Regime 1 (expansion) and Regime 2 (contraction) periods follow a parallel trajectory to the smoothed probability regime classification data in Table 8.

The regime residence times and regime probabilities of the three models identified under Regime 1 and Regime 2 are presented in the Transition probability matrix and Table 7.

Table 7: Regime classification based on smoothed probabilities of Model 1, Model 2, and Model 3

Model 1 MS(2)VAR(2)			Model 2 MS(2)VAR(2)			Model 3 MS(2)VAR(2)					
Regime 1		Regime 2		Regime 1		Regime 2		Regime 1		Regime 2	
Dates	Months	Dates	Months	Dates	Months	Dates	Months	Dates	Months	Dates	Months
2001M02-2001M03	2	2000M03-2001M01	11	2001M02-2001M04	3	2000M03-2001M01	11	2001M02-2001M03	2	2000M03-2001M01	11
2001M08-2001M08	1	2001M04-2001M07	4	2001M08-2002M02	7	2001M05-2001M07	3	2001M08-2002M01	6	2001M04-2001M07	4
2001M12-2001M12	1	2001M09-2001M11	3	2002M11-2003M01	3	2002M03-2002M10	8	2002M12-2003M01	3	2002M02-2002M11	10
2002M12-2002M12	1	2002M01-2002M11	11	2003M12-2004M01	2	2003M02-2003M11	10	2008M08-2008M09	2	2003M02-2008M07	66
2018M08-2018M08	1	2003M01-2018M07	187	2011M05-2011M05	1	2004M02-2011N04	87	2011M04-2011M05	2	2008M10-2011N03	30
2021M11-2021M12	1	2018M09-2021M10	38	2018M08-2018M10	3	2011M06-2018M07	86	2018M06-2018M10	5	2011M06-2018M05	84
2022M12-2022M12	1	2022M01-2022M11	11	2021M10-2022M05	8	2018M11-2021M09	35	2021M10-2022M03	6	2018M11-2021M09	35
2023M01-2023M02		2023M01-2023M02	2	2022M12-2022M12	2	2022M06-2022M11	6	2022M05-2022M08	4	2022M04-2022M04	1
						2023M01-2023M02	2	2022M12-2022M12	1	2022M09-2022M11	3
										2023M01-2023M02	2

Source: Author's calculations

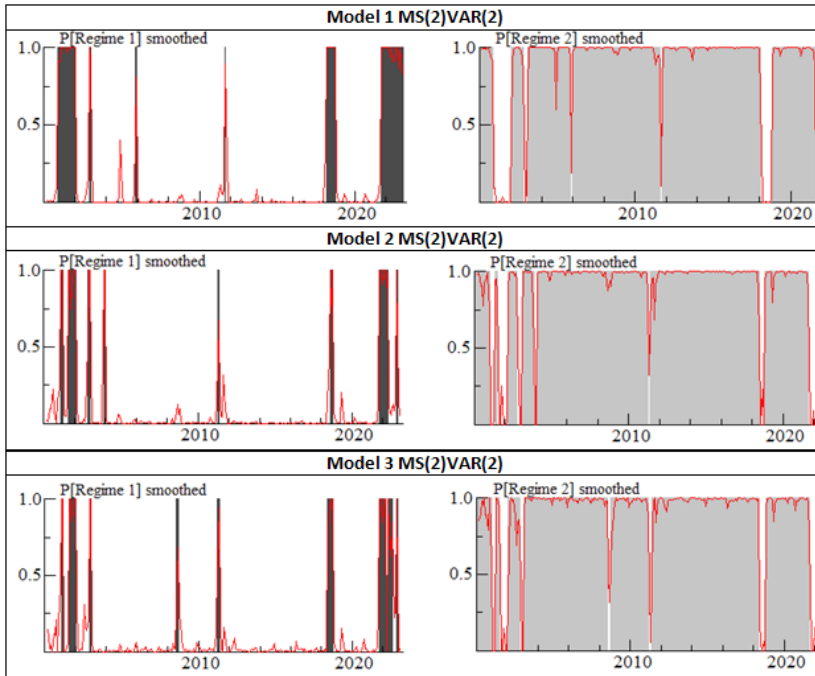


Figure 3: Smoothed probability estimates of regimes

Source: Author's calculations

Model 1:

$$P = \begin{pmatrix} \text{Regim1}_{t+1} & 0.21008 & 0.026551 \\ \text{Regim2}_{t+1} & 0.78992 & 0.97345 \end{pmatrix}$$

Model 2:

$$P = \begin{pmatrix} \text{Regim1}_{t+1} & 0.68103 & 0.042215 \\ \text{Regim2}_{t+1} & 0.31897 & 0.95778 \end{pmatrix}$$

Model 3:

$$P = \begin{pmatrix} \text{Regim1}_{t+1} & 0.21135 & 0.026327 \\ \text{Regim2}_{t+1} & 0.78865 & 0.97367 \end{pmatrix}$$

Table 8: Regime properties

	Model 1			Model 2			Model3		
	Probability	Observation	Duration (months)	Probability	Observation	Duration (months)	Probability	Observation	Duration (months)
Regime 1	3.29%	9	1.29	10.14%	28	3.50	10.87%	30	3.33
Regime 2	97.47%	271	33.38	89.86%	252	89.13	89.13%	250	24.60

Source: Author's calculations

The duration in the expansion regime is 1.29 months in Model 1 and 33.38 months in the contraction regime, according to the results in Table 8. The probability and duration of staying in the contractionary period in Model 1 can be characterized as a negative situation for the national economy. In Model 2 the dwell time in the expansion period was 3.5 months, while in the contraction period, it was 27.56 months. From a macroeconomic point of view, it is negative that the probability and duration of staying in the contraction period are longer in Model 2 than in the expansion period, as in Model 1. In Model 3, residence durations are 3.3 months in expansions and 24.6 months in contractions. The results of Model 3 are similar to those of Models 1 and 2.

The variance decomposition analyses of the MS(2) VAR(2) forecasts of the three robust models are also examined. Variance decomposition is one of the methods used to examine the causes of change in the series (Enders, 2004). The variance decomposition analysis results of the estimation of the three models are presented in Table 9.

In the results obtained in Model 1, after 10 periods the proportionality between the time series in Regime 1 (expansion) is significant. We see that financial globalization ( $dlnfdi$ ) and ( $dlntrade$ ), as components of economic globalization, have no significant effect in explaining changes in ( $dlnemp$ ), which represents public sector size. In Regime 2 (contraction), the explanatory power of globalization variables on public employment increases. In fact, in Regime 2, trade globalization explains 14.50% of the change in public employment at the end of the 10th period. In Regime 2, the most effective variable in explaining the change in public employment is the index of global economic policy uncertainty with 52.10%.

In Model 2, unlike Model 1, it is observed that globalization is effective in the explanation of public expenditures in Regime 1 (expansion). In fact, while ( $dlntrade$ ) explains a change in public expenditure of 34.66% at the end of the 10th period, this rate is 18.81% when financial globalization ( $dlnfdi$ ) is considered. With 28.69%, inflation is the most significant explanatory variable in explaining the change in public expenditure at the end of the 10 periods.

In Model 3, globalization has an impact on tax revenues in both regimes. In Regime 1 (expansion), trade globalization explains 23.97% of the change in ( $dlnntax$ ). In Regime 2 (contraction), ( $dlntrade$ ) is 17.64% effective in explaining a change in ( $dlnntax$ ), while this ratio increases to 40.94% in the case of ( $dlnfdi$ ). In Regime 2, the explanatory variable efficient in explaining the change in tax revenue after 10 periods is ( $dlngepu$ ) with 34.70%.

## 5. Conclusion

Given the results obtained, the main hypothesis of the study, that the relationship between globalization and the size of the public sector may differ in contracting and expanding periods, is accepted. Trade and financial globalization, which are the main components of economic globalization, increase their weight in the economies of countries in different periods. In Turkey, which is the subject of this study, trade globalization in the 1980s and

Table 9: Variance decomposition analyses

Model 1 MS(2)VAR(2)										
Regime 1 Variance Decomposition using Cholesky (d.f. adjusted) Factors										
Variance Decomposition of DLNEMP:	DLNEMP	DLNTRADE	DLNFDI	DLNINF	DLNGEPU					
Period	S.E.									
1	0.017724	100.0000	0.000000	0.000000	0.000000					
2	0.018030	98.49575	0.242234	0.070282	0.496886					
3	0.018601	95.88663	0.271957	0.100391	0.808064					
4	0.018682	95.44234	0.385576	0.833542	0.210316					
5	0.018754	94.94356	0.475114	0.863882	0.214100					
6	0.018765	94.90268	0.474523	0.874800	0.356888					
7	0.018773	94.84037	0.485645	0.878994	0.222350					
8	0.018777	94.81865	0.490341	0.880553	0.224475					
9	0.018778	94.81502	0.490706	0.880618	0.224816					
10	0.018778	94.81091	0.491470	0.881072	0.224817					

Model 2 MS(2)VAR(2)										
Regime 2 Variance Decomposition using Cholesky (d.f. adjusted) Factors										
Variance Decomposition of DLNEMP:	DLNEMP	DLNTRADE	DLNFDI	DLNINF	DLNGEPU					
Period	S.E.									
1	0.017724	100.0000	0.000000	0.000000	0.000000					
2	0.043769	26.47891	10.97237	8.66710	0.000000					
3	0.058627	25.01692	9.010315	16.29592	0.703493					
4	0.088650	26.32139	4.143862	7.963132	0.793214					
5	0.160768	24.60577	25.23929	0.930535	6.530940					
6	0.296635	41.42059	19.46647	5.895119	6.400191					
7	0.608324	11.28911	18.76333	2.664501	4.615783					
8	0.878310	9.082207	21.78409	0.860913	5.741618					
9	0.961925	43.33514	9.736133	5.105646	3.943869					
10	1.791627	29.01256	14.50062	3.056671	1.329979					

Model 3 MS(2)VAR(2)										
Regime 1 Variance Decomposition using Cholesky (d.f. adjusted) Factors										
Variance Decomposition of DLNEMP:	DLNEMP	DLNTRADE	DLNFDI	DLNINF	DLNGEPU					
Period	S.E.									
1	0.171044	100.0000	0.000000	0.000000	0.000000					
2	0.212587	65.99554	19.58309	0.920998	6.149564					
3	0.258840	47.27995	34.07076	0.652658	13.00699					
4	0.375993	24.90638	34.50778	1.856221	31.34964					
5	0.733411	8.406991	34.54435	16.70195	28.80430					
6	1.534967	2.972896	32.99962	19.79934	29.00164					
7	3.257764	1.555100	34.48905	18.82784	28.38324					
8	6.953936	1.400933	34.91293	18.81693	28.59928					
9	14.76753	1.322799	34.62552	18.53406	28.85968					
10	31.54599	1.361815	34.66204	18.81277	28.69302					

Model 3 MS(2)VAR(2)										
Regime 2 Variance Decomposition using Cholesky (d.f. adjusted) Factors										
Variance Decomposition of DLNEMP:	DLNEMP	DLNTRADE	DLNFDI	DLNINF	DLNGEPU					
Period	S.E.									
1	0.171044	100.0000	0.000000	0.000000	0.000000					
2	0.216784	99.71573	0.092491	0.004812	0.173249					
3	0.219739	98.93200	0.273208	0.082810	0.216482					
4	0.222380	97.93920	0.563000	0.132855	0.212163					
5	0.224423	97.79085	0.708077	0.140665	0.212088					
6	0.224709	97.75299	0.713790	0.140454	0.212597					
7	0.224711	97.72241	0.716608	0.141829	0.212942					
8	0.224795	97.71501	0.723529	0.142191	0.212897					
9	0.224804	97.71309	0.724776	0.142187	0.212918					
10	0.224805	97.71253	0.724777	0.142232	0.212951					

Model 3 MS(2)VAR(2)										
Regime 2 Variance Decomposition using Cholesky (d.f. adjusted) Factors										
Variance Decomposition of DLNEMP:	DLNEMP	DLNTRADE	DLNFDI	DLNINF	DLNGEPU					
Period	S.E.									
1	0.127531	100.0000	0.000000	0.000000	0.000000					
2	0.225913	50.87331	0.000000	0.000000	0.9735737					
3	0.289569	38.95481	7.336398	30.47866	3.178017					
4	0.450290	34.63923	10.17569	14.95249	3.13030					
5	0.775956	12.69794	8.328896	44.08731	3.897341					
6	1.252756	16.71644	9.368699	39.51185	4.017489					
7	2.326767	8.895150	14.54029	38.16718	3.62666					
8	4.170851	4.844887	13.68417	43.21045	3.518487					
9	7.604040	6.524320	16.28211	41.39652	2.44921					
10	13.90483	4.868179	17.64658	40.94546	1.831033					

Source: Author's calculations

financial globalization with financial liberalization at the end of the 1980s gained importance. After the 1990s-2000s, which is referred to as the hyper-globalization period, the Turkish economy witnessed significant crises, contraction, and expansion periods. As a result of the estimations made with three different MS(2) VAR(2) models, the high probability and duration of contraction periods in Turkey in all three models is important in terms of economic-fiscal policies to be implemented.

It is concluded that trade and financial globalization do not affect public employment as a variable representing the size of the public sector in Turkey during expansionary periods. In contractionary periods, a positive relationship was found between trade globalization and public employment. This result shows the validity of the compensation hypothesis. In Turkey, various public employment opportunities have been offered and public employment has been supported by public policies and projects during the contractionary periods. Results confirm Epifani and Gancia (2008), Agenor (1996), Rodrik (1998, 2011), and Gözgör *et al.* (2019) studies only for contraction periods. Regarding the relationship between globalization and public expenditures within the scope of Model 2, it is concluded that both trade and financial globalization are positively related to public expenditures only in expansionary periods. In this relationship, trade globalization is found to be more effective in explaining the change in public expenditures. These results confirm the findings of Rodrik (1998), Alesina and Wacziarg (1998), Bernauer and Achini (2000), Shelton (2007), Epifani and Gancia (2008), Kimakova (2009), Shonchoy (2016), Kim *et al.* (2018), Anderson and Obeng (2021), Kim and Lee (2021), Bharati *et al.* (2023), limited to expansionary periods only.

In Model 3, it is concluded that globalization has an impact on tax revenues in both expansion and contraction periods and the relationship is negative. While trade globalization has a limited effect on tax revenues in contractionary periods, financial globalization is found to be 40% effective in explaining the change in tax revenues. The increase in the demand for foreign investments and the provision of tax facilities in order to make the country attractive for foreign investments during recessionary periods are the policy practices that support this result. The findings obtained are in line with Cameron (1978), Bernauer and Achini (2000), Garrett and Mitchell (2001), Adsera and Boix (2002), Dreher (2006), Onaran and Boesch (2014), Jha and Gözgör (2019), Bachas *et al.* (2022). The results of Quinn (1997) and Heinemann (2000) are confirmed in terms of expansion and contraction periods.

All these results show that the effect of trade and financial globalization on the size of the public sector and the direction of the effect change in terms of contraction and expansion periods. While trade globalization is effective on public sector size in all three models, financial globalization is found to have a negative effect only on tax revenues in Model 3. While trade globalization in Turkey affects public employment and public expenditures positively under the compensation hypothesis, the efficiency hypothesis is confirmed in the case of tax revenues. The race-to-the-bottom hypothesis over the period considered is valid because of the efficiency hypothesis. These results, considering Turkey's institutional

structure, show that policymakers have turned to different political economy practices during contraction and expansion periods against the risks arising from globalization.

The results obtained require policymakers to adopt measures appropriate to the expansion and contraction phases of the business cycle while ensuring economic stability in the process of globalization. It should be noted that increasing public spending during economic expansions associated with globalization can have adverse effects on inflation. In times of economic contraction, the positive impact of globalization on public employment is one of the most important measures that the public sector can take to protect social welfare against external risks. Another important issue for policymakers and practitioners is that globalization and the race to the bottom on taxes and labor rights are having a negative impact on budget deficits and unemployment, especially in developing countries. In transition economies, it is important to regulate markets before they are opened up to competition through globalization in order to protect economies from external risks.

In the future, it is intended to carry out studies that look at countries with similar socio-economic structures together, so that generalizations can be made by considering periods of expansion and contraction.

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