CONSUMPTION AND ECONOMIC GROWTH: PATH ANALYISIS OF STRUCTURAL EQUATION MODEL APPROACH IN TURKEY

Tüketim Ve Ekonomik Büyüme: Türkiye'de Yapısal Eşitlik Modeli Yaklaşımının Yol Analizi

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ABSTRACT

The purpose of this study is to examine the relationship between consumption expenditures and economic growth for Turkey over the period of 10 years with path analysis of the structural equation method. With the tourism, government and household consumptions data from the Turkish Statistical Institute database, this paper develops the causal model using the path analysis to estimate the direct effects of these variables on economic growth in Turkey.

Findings of this study show that there are positive correlations among variables. The coefficients of tourism, government and private consumptions on economic growth are significant (correlation coefficients, r= 0.07, 0.23 and 0.72 respectively).

We obtained clear evidence that the effects of household consumption on economic growth are higher and significant compared to private and tourism government spending. Therefore, Turkey's fiscal plan should direct expenditures into the productive areas such as education, health, agriculture, energy, technology and government needs to stimulate household consumption by redesigning social security policy, increasing consumer's credit, reducing the tax rate etc.

Key Words: Consumptions, Economic Growth and Path Analysis

JEL Codes: E21, H51, H52, C32

ÖZET

Bu çalışmanın amacı, Türkiye için 10 yıllık dönemde tüketim harcamaları ile ekonomik büyüme arasındaki ilişkiyi yapısal eşitlik yönteminin yol analizi ile incelemektir. Türkiye İstatistik Kurumu veri tabanından elde edilen turizm, hükümet ve hane halkı tüketim verileri ile bu makale, bu değişkenlerin Türkiye'deki ekonomik büyüme üzerindeki doğrudan etkilerini tahmin etmek için yol analizini kullanarak nedensel modeli geliştirmektedir.

Bu araştırmanın bulguları, değişkenler arasında pozitif korelasyonlar olduğunu göstermektedir. Turizm, hükümet ve özel tüketimlerin ekonomik büyüme üzerindeki katsayıları anlamlıdır (korelasyon katsayıları sırasıyla r = 0,07, 0,23 ve 0,72).

Hane halkı tüketiminin ekonomik büyüme üzerindeki etkilerinin özel ve turizm hükümeti harcamalarına göre daha yüksek ve önemli olduğuna dair net bulgular elde edilmiştir. Bu nedenle, Türkiye'nin mali planı; sosyal güvenlik politikasını yeniden tasarlayarak, tüketici kredisini artırarak, vergi oranını düşürerek vb. eğitim, sağlık, tarım, enerji, teknoloji ve devlet ihtiyaçları gibi üretken alanlara yapılan harcamalara yönlendirilmelidir.

Anahtar Kelimeler: Tüketim, Ekonomik Büyüme ve Yol Analizi

JEL Kodları: E21, H51, H52, C32

1. INTRODUCTION

Consumption expenditures have been one of the most important drivers of economic growth over the period of long time for many economies. An increase in consumption expenditures is likely to boost aggregate demand which is critical for economic growth in the long-run. On the other hand, the 1929 Great Depression, 2008/09 global financial crisis and the Covid-19 pandemic crisis have triggered huge economic downturn that caused unprecedented fall in consumer demand.

Regardless of the amount of the economic costs, all these crises have proved that actions for stimulating consumption spending gotten better for the world economies.

Due to the low level of savings, the tax incentives for the private or public consumptions are indispensable factors of economic growth for mostly developing countries.

Therefore, the share of consumptions in total GDP (Gross Domestic Production) is very large in most of the developing countries to support economic growth.

The trends in consumption indicators over the last years are likely to increase for the emerging countries. We provide data for BRICS-T countries from 1988 to 2019 in Figure 1 to show the trends among these variables. While the highest value in 2019 belongs to Brazil, the lowest value belongs to China with 55.5 percent in 2019. The graph below shows that household consumption as percent of GDP in Turkey remains relatively stable and it ranges at the lowest level of from 71 percent to 83 between 1988 and 2019.
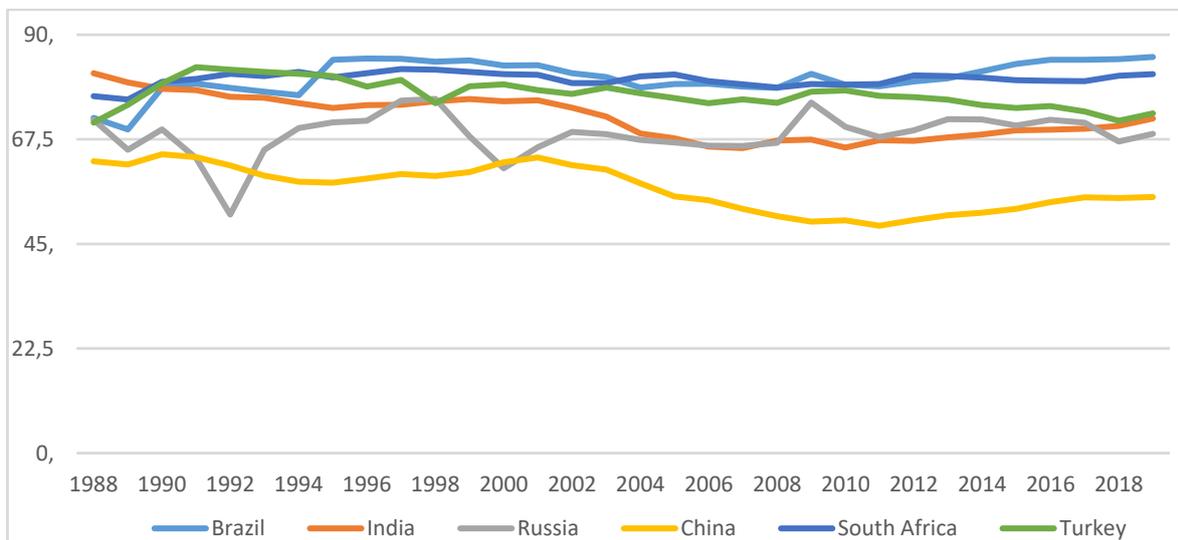

Figure 1. Final consumption expenditure (% of GDP) in BRICS-T countries, 1988-2019
Source: World Bank, 2020.

In order to improve their economic growth, most of the countries have tried to stimulate their consumption expenditures at a faster pace.

Following the liberalization period in 1989, the share of public expenditures in GNP (Gross National Production) has risen to 35% in Turkey. Since the "Transition to a Strong Economy" program in 2001, this ratio has decreased gradually and ratio of private consumptions as hare of GNP has been widening over time. For the economic growth and consumption relations, we presented data for Turkey from 2000 to 2020 from World bank dataset.

Consumption expenditures are seen an important signal indicator from the figure II that it moves along with the economic growth over the long time.
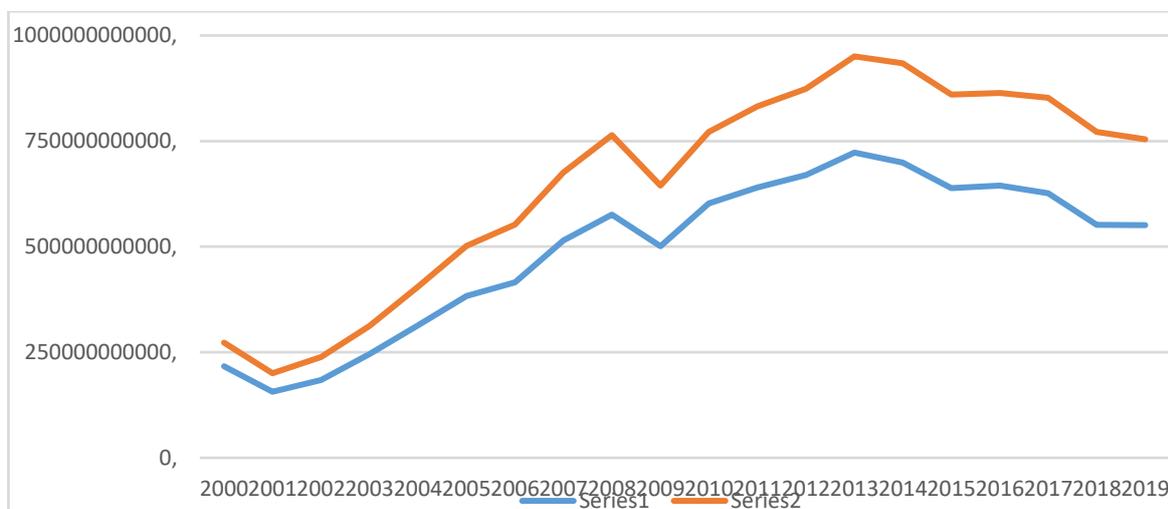

Figure 2. GDP and final consumption expenditure (million current, US$)
Source: World Bank, 2020.

Structural Equation Modeling (S.E.M.) is one of the basic data analysis technique in social sciences to check the cause and effect relationship among the multiple variables. It is a statistical technique that is quite widely used in quantitative researches. There are four special types of structural equation modelling (Ullman, Bentler, 2013:661). Path, Confirmatory factor (C.F.), Latent Variable Structural, Growth Curve types.

We perform our tests using the Path, which is a special type of SEM analysis in this article. Path analysis is a special form of S.E.M. that containing only on observed variables without latent ones, and it is based on the multiple regression techniques to test causal relationship.

The basic differences between the path analysis and SEM can be summarized in Table 1 as follows:

Table 1. The basic differences between the path analysis and SEM

Path Analysis	SEM
Contains only observed variables	Contains both observed and latent variables
Assumes that all parameters are estimated without error.	Includes latent variables to account for measurement error.
Asssumes more restrictive assumptions (no correlation between the error terms)	Includes more flexible assumptions
Deals only with measured variables.	Uses multiple regression and factor analysis.

Source: Murti, 2016.

In conclusion, SEM is the extended version of Path analysis or SEM is the combination of C.F. and Path analysis. In our study, we have only observed variables which we have just performed the Path analysis.

Regarding to the impact of government expenditure, household consumptions and tourism expenditures on the economic growth, this paper summarizes the selected studies in the literature.

Ram (1986) performed panel data analysis for 63 countries for the period of 1950-1980. He concluded that the effects of government size on economic development is limited for these countries.

Knoop (1999) studied the effects of government spending on economic growth in the US using OLS method with time series, concluded that a reduction in the size of the government (reduction in government spending) would have an adverse impact on economic growth and welfare.

Ertugrul et al. (2015) studied empirically the effects of tourism on economic growth for for the 1998–2011 periods in Turkey. They found evidence of a long-run uni-directional causality running from tourism to economic growth, but not vice versa.

Nyambe and Kanyeumbo (2015) examined the effects of government and household expendıtures on economıc growth in Namıbıa. They found positive relationship between economic growth, government expenditure, household expenditure.

E.L. Kimaro et al. (2017) analyzed the relationship between the share of government consumption expenditure and economic growth for 25 low income SSA countries, covering the period from 2002 to 2015 with panel data analysis. Their findings suggest that government expenditure and economic growth were positively related in the study countries.

Rafiy et al. (2018) examined the effect of the consumption spending on Indonesia's economic growth using the autoregressive distributed lag (ARDL) model. According to their results, there are long-run and short-run effects of consumption spending on economic growth.

The rest of this article is organized as follows: Data, methodology and empirical results are presented in section II. The last part is reserved the conclusions.

2. DATA, METHODOLOGY AND EMPIRICAL RESULTS

In our study, we analyze the relationship between consumptions and economic growth with path analysis of the structural equation model. Total household, government and tourism expenditures are used as a measure of consumption expenditures in our model. We take monthly consumption data as a share of GDP in Turkey over the period 2009Q1-2019Q2. All data is collected by the Turkish Statistical Institute.

In our model, we determine tourism, household and government consumptions expenditures as three exogenous variables, and government expenditures and economic growth as endogenous variables in our model.

First of all, we estimate econometrically the impact of household consumption and tourism consumption on the government expenditures and then the effect tourism expenditures, household expenditures and government expenditures on the economic growth. This paper converts the data into a logarithmic form to overcome the outlier problem. All analyses were conducted using Stata version 14.0 in our study.

Specifically, our theoretical model is shown in Figure III. We try to provide the causality relation between the consumption expenditures variables and economic growth. We apply the correlations analysis between the variables. Among three different model, we conduct the Path Model Analysis in the Structural Equation Model since we are not able to create latent variables.
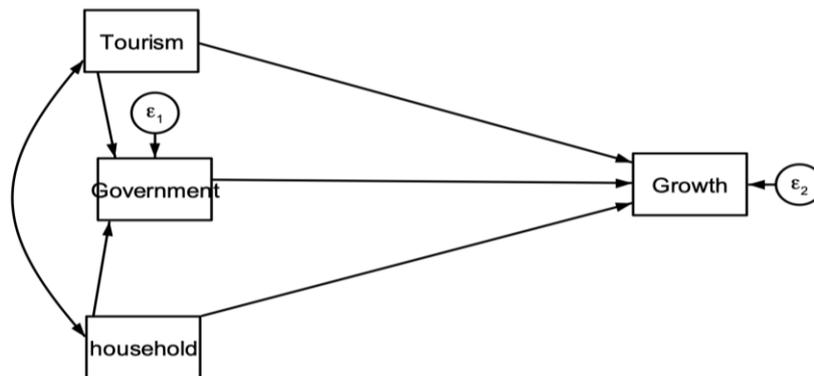

Figure 3. Example of a structural equation model

Figure III presents an example of a path analysis model examining the effects of the tourism, household and government consumption on the economic growth. This paper proposes a hypothetical model as shown in Figure III.

The following three hypotheses are examined in this study:

H1: There is casual relation between the household and the government expenditures.

H2: There is casual relation between the tourism and government expenditures.

H3: There is casual relation among the tourism, household, government expenditures and the economic growth.

2.1. Empirical Results

Firstly, we carry out descriptive analysis for each variables and then the degree of association is measured by the correlation analysis. Later, we apply path analysis of the structure equation model to provide the impact of consumptions on economic growth in Turkey.

We calculate the descriptive statistics and the results of calculation are in the following table, where information regarding to their descriptive statistics are provided. Table 1 summarizes the descriptive statistics of the variables in Turkey over the period 2005-2016.

Table 2. Summary statistics of the variables (logarithmic Form), NO=42

	Mean	Std. Dev.	Min	Max
Tourism Expenditures	22.29251	0.6010339	21.30102	23.77438
Household Expenditures	26.42059	0.4053488	25.63648	27.10173
Government Expenditures	24.99435	0.443436	24.27042	25.87535
Growth	26.92282	0.4410285	26.07633	27.65732

Table 2 explains the correlation matrix of the variables involved and the coefficients whose magnitude are 0.99 and 0.98 indicate respectively household and government consumption variables which can be considered very highly correlated with growth. The correlation coefficients whose magnitudes are between 0.99 and 0.98 indicate that household, government consumption expenditures and economic growth variables which can be considered very highly correlated.

Table 3. The correlation matrix. variables: The economic growth, household, government, tourism expenditures

Growth	1
Household Cons.	0.9985
Government Cons.	0.9822
Tourism Cons.	0.6973

Following the correlation analysis results, we further conduct path analysis model to test hypothetical relationships among our variables. This model allows testing theoretical hypothesis casual relations without manipulating independent variables. It provides confirmatory and non-exploratory approach among variables that graphically represent those relationships. Figure 4 shows the path diagram corresponding to Figure 3 defined by the structural equations and the correlations among the variables.
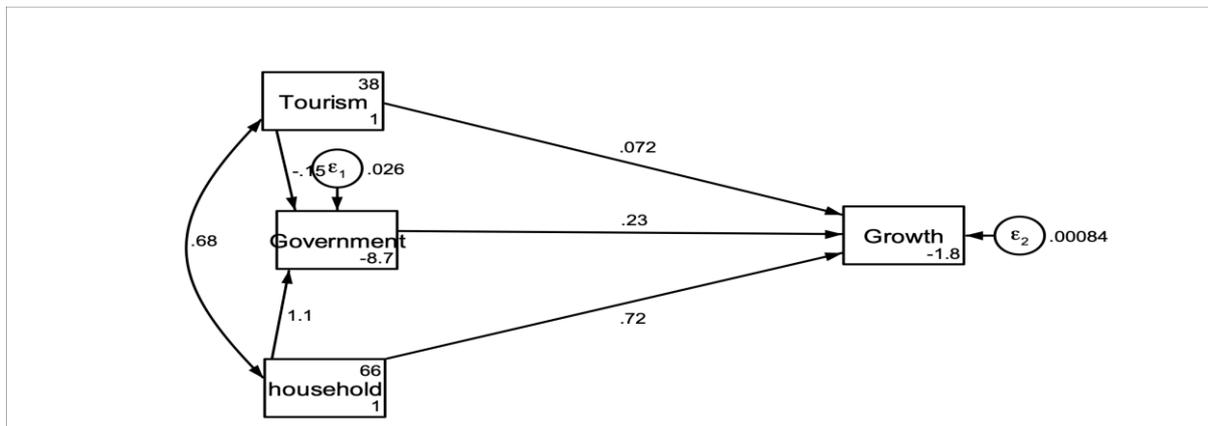

Figure 4. Path diagram of how economic growth is affected by the tourism, government and household consumption expenditures

Figure 2 depicts the direct effects of each data on the endogenous variables. The regression coefficients of each variable which indicate that one standard deviation increase in the tourism, government and household expenditures causes 0.072, 0.23, 0.72 standard deviation increase respectively in the economic growth. In addition, all of the path coefficients were significant.

the path from "household expenditures" to "the economic growth" had the highest path coefficient with a coefficient of determination (R^2) of 0.72.

Table 3 shows all the estimates, standard errors, p values. We also have all the fit statistics. It gives unstandardized coefficients that reflect the linear change in the dependent variable for a one-unit change in the predictor.

For a coefficient value $\beta= 0.231$, a 1 unit change in government expenditures there is, on average, an 0.2 unit change in economic growth.

The coefficient from household consumption and tourism expenditure to the government expenditures are 1.08 and -0.15 respectively, and the same time the mean values for tourism expenditures and household consumptions are about 38 and 66 respectively.

Table 4. Results of the unstandardized estimates for hypothesis in path model

DEPENDENT VARIABLE				
Government				
Independent Variables	**Coeff.**	**Std. Err.**	**z-value**	**P(>|z|)**
Tourism	-0.149442	0.0385869	-3.87	0.000
Household	1.081884	0.0276643	39.11	0.000
_cons	-8.713391	1.727873	-5.04	0.000
Dependent variable				
Growth				
INDEPENDENT VARIABLE	**Coeff.**	**Std. Err.**	**z-value**	**P(>|z|)**
Government	0.2311211	0.0282506	8.18	0.000
Tourism	0.0719299	0.0108151	6.65	0.000
Household	0.7230927	0.0306202	23.61	0.000
_cons	-1.802218	0.4247053	-4.24	0.000

Mean (Tourism)	37.53987	4.098841	9.16	0.000
Mean (Household)	65.96997	7.199567	9.16	0.000
Variance(Government)	0.0264712	0.0080603	0.0145743	0.0480
Variance (Growth)	0.0008397	0.000259	0.0004587	0.0015
Variance (Tourism)	1	.	.	.
Variance (Household)	1	.	.	.
Covariance(Tourism)				
Covariance (Household)	0.6781245	0.0833465	8.14	

We have the results of our estimation, multiple regression analysis allows rejection of the hypothesis III that there is no relationship among the variables. Therefore, the influences of tourism consumption, household consumption and government expenditures on growth. (H3 regression coefficients 0.07, 0.23 and 0.72 respectively). At

Table 5. Path analysis results and summary of hypotheses

Dependent Variable	Independent Variable	Direction and Magnitudes	Results
Government	Tourism, Household	H1	Accept
Tourism	Government	H2	Reject
Growth	Tourism, Household, Government	H3	Accept

As a final point, table 5 reports the absolute fit indices which are useful guide for our path analysis in a structural model

Table 6. Fit indices and their acceptable thresholds

Population error		
RMSEA	0.00	Root mean squared error of approximation
Pclose	0	Probability RMSEA <= 0.05
Baseline comparison		
CFI	1	Comparative fit index
TLI	1	Tucker-Lewis index
Size of residuals		
SRMR	0.00	Standardized root mean squared residual
CD	0.99	Coefficient of determination

Root Mean Square Error of Approximation (RMSEA) is one of the widely used fit indices in the path analysis of SEM model. According to table, we define our model as "close fit" with estimated p value of RMSEA less than 0.05

CFI (Comparative fit index) and TLI (The Tucker-Lewis index) are two incremental fit indices that compare statistical significance of a hypothesized model with that of a baseline model.

Estimated CFI and TLI values are greater than 0.95 which means that our model is good fit.

Finally, we assess goodness of fit for our model based on inference statistics of the SRMR criterion. According to Hu and Bentler, 1999), SRMR less than 0.08 indicates the model fits well. 0.00 of SRMR represent a good fit for our model. Table finally reports the coefficient of determination (CD). And estimated value close to 1 which verify a good fit for our model.

3. CONCLUSIONS REMARKS

Despite the fast growth of the Turkish economy in the past several decades, there is still some debates in the relevant literature that whether we should defense the growth model based on consumptions or not. This debate makes important to test econometrically the impact of consumptions on economic growth.

For this reason, we examine the relationship between the tourism expenditures, household consumption, government expenditures and economic growth. In this paper, we performed the Path analysis through the SEM model and as per the results the impact of household consumption, government expenditures and tourism expenditures are positive respectively but the impact of household consumption is higher than government expenditures, and tourism expenditures. For this reason, government needs to stimulate the

consumption expenditures by easing the credit channels, providing tax reduction and improving the social security system. But also it should take some economic measurements to lessen current account deficit resulted from consumption boom.

REFERENCES

Ertuğrul, H.M. & Mangır, F. (2015). "The Tourism-Led Growth Hypothesis: Empirical Evidence from Turkey", Current Issues in Tourism, 18(7), 633-646

Kimaro, E.L., Keong, C.C. & Sea, L.L. (2017). "Government Expenditure, Efficiency and Economic Growth: A Panel Analysis of Sub-Saharan African Low Income Countries", African Journal of Economic Review, V(II), 34–54

Knoop, T. A. (1999). "Growth, Welfare, and the Size of Government", Journal of Economic Inquiry, 37(1), 103-119

Murti, B. (2016). "How to Conduct Path Analysis and Structural Equation Model for Health Research", http://theicph.com/wp-content/uploads/2016/09/How-to-conduct-Path-Analysis-and-SEM-for-Health-Research_24-Sep-2016_Prof-Bhisma-Murti.pdf

Nyambe, J. & Kanyeumbo, J. N. (2015). "Government and Household Expenditure Components, Inflation And Theır Impact On Economic Growth in Namıbıa", European Journal of Business, Economics and Accountancy.

Rafiy , M., Adam, P., Bachmid, G., & Zainuddin S. (2017). "An Analysis of the Effect of Consumption Spending and Investment on Indonesia's Economic Growth", Iran. Econ. Rev., 22(3), 753-766

Ram, R. (1986). "Causality between Income and Government Expenditure: A Broad International Perspective," Public Finance Journal, 41, 393-400.

Ullman, J. B. & Bentle Peter M. (2013). Structural Equation Modeling, (Ed. Irving B. Weiner, John Wiley & Sons), Handbook of Psychology (Second Edition), USA.