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COINTEGRATION ANALYSIS OF INCOME CONSUMPTION RELATIONSHIP OF EU AND OECD COUNTRIES

A PANEL DATA ANALYSIS APPROACH

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Abstract

The phenomenon of consumption is one of the most significant issues of economic theory and econometric research. It has been scientifically discussed since the mid-twentieth century even though it began with the history of humanity and has continued until today. Since income is the key determinant of consumption, the level of consumption affects the level of savings, and the level of savings affects investment, the research interest on the relationship between income and consumption is constantly rising. This study considers the cross-sectional dependence among panel data using 1980-2013 data of absolute income hypothesis. The stability of the series is analyzed using CADF test, cointegration relationship is tested using the Westerlund (2008) Durbin-H and Westerlund (2007) ECM tests, and cointegrating coefficients are estimated using the Peseran (2007) CCE estimator. The results indicate that the Absolute Income Hypothesis is applicable for the EU and OECD countries. Thus, the study confirms the validity of the Keynesian absolute income hypothesis stating that consumption is a positive but diminishing function of income.

Keywords: Consumption, Consumption Theories, Absolute Consumption Theory, Consumption Hypothesis, Panel Cointegration Analysis

INTRODUCTION

Although the concept of consumption, one of the most important concepts of economic theory and econometric research, started with the history of humanity and survived until today, its scientific examination started in the mid-20th century. The need has emerged to examine the concept of consumption from economical and sociological aspects as consumption is a social and economical relationship type that depends on demands such as want, desire, need and the necessary money or such value for products and services to meet the demands as well as time and location (Mızırak, 2005:13). Therefore, the reason why the consumption expenditures is focused on greatly is that consumption has an important role in the survival of individuals' lives. This is why consumption is one of the prominent subjects of economic theory. Additionally, as consumption manifests the characteristic of being a type of consumption constituting the majority of Gross National Product (GNP) percentile, it is one of the most important macro-economic indicators that need to be evaluated in determination of economic policy in a country (Türkmen, 1995:1). The focus on income-consumption relationship increased due to the fact that consumption, particularly, is the key determinant income as well as the effect of consumption level on level of savings and the effect of savings on investments. Many theories were suggested related to the concept of consumption within this context. The most well-known consumption theories are Absolute Income Theory of John Maynard Keynes; Relative Income Theory of Duesenberry, Intertemporal Consumption Theory of Fisher, Permanent Income Theory of Friedman, and Lifecycle Theory of Consumption of Modigliani. The Absolute Income Theory (AIT), developed from "Fundamental Psychological Law" in the General Theory of Employment, Interest, and Money published by Keynes in 1936, has an important place among consumption theories. Keynes defines the fundamental psychological law as the decrease of average consumption tendency and increase of savings as income increases. However, assumptions of Keynes about consumption function is based on the fundamental psychological law, that is accepted by everyone, rather than statistical research (Okcu, 2008:2). The consumption function in AIT indicates the functional relationship and can be stated as $C = f(Y)$. Therefore, the income-consumption relationship in Keynes' theory can be functionally stated as:

$$C = a + bY, \quad a > 0, \quad 0 < b < 1$$

Where, *C* is current real consumption (total or households); *Y* is individual current real disposable income and total real national income; *a* is autonomous consumption and *b* is marginal propensity of consumption (MPC). Marginal propensity of consumption is accepted as bigger than zero but smaller than one in the Keynesian model. Within AIT, increase of savings leads economy to depression while the increase of consumption expenditures mobilizes the

economy. This is why Keynes considers savings as one of many products that consumers will spend their income on (Türkmen, 1995: 10).

The Relative Income Theory (RIT) which tries to associate short- and long-term consumption functions, is suggested by J. Duesenberry and developed through observations of consumption behavior of households. The contribution of Duesenberry's relative income theory to economics was to bring explanation to the conflicting results of analysis based on short and long term time-series analysis. Duesenberry observed that individuals' consumption and saving behaviors are affected greatly by the social environment they live in (Yıldırım et al., 2012: 565-570). Economists do not put much importance on RIT developed by Duesenberry, other than the fact that it brought a different perspective to the contradiction between long-term consumption function and short-term consumption functions. The reason for this is the consideration of the micro-foundations of Duesenberry's RIT and Keynes' AIT as insufficient. However, both Duesenberry's RIT and Keynes' AIT are criticized for not being a method that is based on the attitude of utility-maximization of consumers (Ünsal, 2007:421-424).

The model that analyzes how rationalist, forward-looking consumers make intertemporal choices, in other words, how they make choices that involves different time periods, was developed by economist Irving Fisher. Fisher examined consumption expenditures from micro-economic aspects with this theory that he developed in 1930. In theory, savings and consumption preferences of consumers in a broad time period is being examined and methods for determining the most suitable consumption model that increases consumer's utility to maximum in every period are being studied (Pehlivan, 2006:12). From the point of these studies, consumption plans of households not only depend on the income of the period that they are in but also the income streams expected in the future, the market interest rate that will discount this income stream to today and the rate of time preference of the household in intertemporal consumption theory (ICT). In ICT, a connection between saving and consumption preference is formed because positive saving is a result of a decision that postpones the existing consumption and negative saving is a result of a decision that increases today's consumption at the expense of future consumption (Türkmen, 1995:90). Therefore, in ICT, the consumer makes his consumption decision under the restriction of budget and loan. While consumers generally tend to increase the amount and quality of products and services that they consume, it is not possible to do all desired consumption expenditures because of budget possibilities. This situation is defined as budget restriction and it is shown with budget line. Hence, if consumers have to choose between their consumptions today and saving for their future consumptions, this situation is called 'intertemporal budget restriction' (Dönek, 1996:85; Mankiw, 2010:397). On the other hand, in the Fisher model, it is possible for the consumer to

save according to circumstance or incur a debt. The consumer has the opportunity to not spend some of his income in a certain period and loan (saving) it with the condition of getting it back with interest. Also, he has the opportunity to get a loan and make an expenditure (negative saving) at that time (Ünsal, 2001:302). Individual's meeting the consumption by getting a loan means he cannot meet the consumption today with his current income. So, if a consumer's current income cannot meet the current consumption and the consumer believes that he will get a higher income in the future than the current income, he will not avoid obtaining a loan to meet his current consumption. However, the consumer cannot always find a loan or find enough loan to cover his current consumption. This situation is called liquidity restriction.

The starting point of the approach called permanent income hypothesis (PIH), which is developed by an American economist, Milton Friedman in 1957, is the intertemporal consumption analysis of Irving Fisher. This hypothesis emerged from the lack of the use of current income as an indicator of consumption expenditures (Ünsal, 2007:432). According to Friedman, society adjusts its consumption behavior according to permanent income or long-term consumption opportunities, not current income level. Friedman defines permanent income as an expectation related to average usable income stream that will be provided to consumers by human wealth and other physical and financial wealth. Human wealth, here, means equipped work-force and equipped work-force means increasing education and work experiences of people. Physical wealth can mean physical consumption property such as land, house, car etc. that people own. It can also be financial wealth e.g. bonds and stock (Bocutoğlu, 2011:121).

Individuals have to determine whether the increase in their income is permanent or temporary. However, individuals do not have clear information about what portion of this increase in their income is permanent and what portion is temporary. The fact that transitory income does not have an important effect on consumption is suggested by Friedman's permanent income theory. The permanent portion of the increase in income has been solved through a utilitarian way and therefore, existence of a connection between past income and current income in permanent income theory (Özmen, 1997:84). Permanent income is not a magnitude that is observed experimentally on the contrary to measured income. Permanent income is a theoretical income magnitude that is in some ways assumed by individuals. In this hypothesis, it is accepted that individuals determine the permanent income within the frame of adaptive expectations hypothesis. In other words, they determine the permanent income by looking at the past value of permanent income.

The starting point of the lifecycle theory of consumption developed by an American economist F. Modigliani since the mid-1950s, is the analysis of Fisher's intertemporal consumption. According to this theory, consumption in an economy in the period of *t* depends

on consumers' expectations of income that they will get for a life time, not on the income they get in *t* period. Individuals who are examined within the theory will get more income during the working period of their lives than the income they will get during retirement. For this reason, individuals finance the exceeding portion of consumption during retirement by doing positive saving during the working period of their lives to do consumption flattening (Mankiw, 2010:529-532).

According to lifecycle theory of consumption, factors such as inheritance and other transfers, income and other risks, insurance and credit market, productivity growth, habits and labor supply affect individuals' savings. In addition to these factors, the effect of demography can be mentioned (Mankiw, 2010: 532-533). Modigliani and Ando suggested in their studies that demographic characteristics such as age distribution of population is important for changes in consumption behavior. An individual plans his income and wealth at a level where he can meet his consumption and he starts making this plan beginning from the first year he starts working. According to the theory, the year which income and wealth are received, is the year a person starts working. The income an individual will get is low in the first and last years of life while it is higher in middle years. In other words, an individual's productivity is low in the first and last years of life and higher in middle years. That is why, the age of an individual is an important factor that determines his consumption and saving behavior (Bocutoğlu, 2011:118-121). Another factor that affects consumption and saving is having social security programs. According to the hypothesis, consumption during retirement period is not provided only by savings. During this period, there are government transfers and support from children. According to this, in countries where social the security system runs smoothly, the difficulty of saving for retirement period decreases for individuals and the total savings nationwide decreases (Uluatam, 1998:152-157).

Within this context, the aim of this study is to analyze the Absolute Income Theory of Keynes for 16 EU and 26 OECD countries that have data, with panel cointegration tests under cross-sectional dependence by using data for the 1980-2013 period. The following section provides a literature review on income-consumption relationship; the third section discusses data and the model; the fourth section discusses methodology, and the fifth section provides results and conclusion.

LITERATURE REVIEW

Many theories were developed starting from the 18th century, particularly by John Maynard Keynes on consumption and income relationship and these theories are examined in micro and macro levels. These studies differ in terms of theories they test, and method, data, period and

country groups they use. Studies in literature are categorized as data gathered through survey, time-series and panel data analysis based studies.

Klein and Liviatan (1957) addressed 305 different families living in London, England in their studies. They conducted a survey on the households of these families and researched if there is any parallelism in terms of expenditures of families who receive income through inheritance. According to the findings, there is a parallel increase in the expenditures of families who had an increase in their income through inheritance.

Eisner (1958) tested the validity of permanent income theory with the data of family budget surveys conducted in the United States of America (USA). According to the results of analysis performed based on survey data, the permanent income theory is found to be valid.

Özer (1992) tried to determine the life standards of 400 households in Erzurum through conducting surveys. Five different consumption functions determined in the study were assumed by the least-square technique and their hypothesis was tested. It is decided that the income hypothesis is valid and the linear model is the best model.

Aşırım (1996) created a consumption model representing Turkey in a study where he tested whether consumers in Turkey behave according to the lifecycle hypothesis. In this study, it was seen that the consumption in Turkey is deferred only one period. In other words, consumers want to consume in every quarter as much as they planned in previous quarter.

Özer (2001), examined consumption structures of households with the cross-sectional data received from the Household Consumption Expenditures Survey conducted in Erzurum. This study tried to determine the model that best explains the consumption behaviors of households in Erzurum by assuming created models representative of income hypothesis. Results of the analysis showed that the Engel law is valid for Erzurum as well, that demographic characteristics such as occupation and education in addition to income and climate are main factors that affect consumptions and the model that explains the consumption tendency of households is the linear model. Additionally, when the studies conducted between 1986 and 1991 in Erzurum are compared with the results of this study, it is found that although welfare level increased, it was still found to be at a very low level.

Nişancı (2003) analyzed household expenditures in urban areas of Turkey in 1994 with Engel curve by using the results of a survey conducted by State Institute of Statistics throughout Turkey to determine the consumption expenditures of households in rural and urban areas in 1994. According to the expenditure flexibilities found from sample averages, food, housing and rent group are found to qualify for compulsory goods.

Tarı, Calışkan and Bayraktar (2006) estimated students' consumption functions by using the data gathered from the survey conducted in Kocaeli University in 2004. They researched if

factors of students' gender and the program that they are in have an effect on consumption behaviors. According to the results of the analysis, male students have 3,1% lower marginal consumption propensity than female students. They did not find a significant difference in consumption behaviors in students who are in different programs. Also, housing and nutrition were found to be the biggest portion in student consumption budget.

Marangoz (2006) conducted a survey in 350 people to determine the expenditure propensity of older consumers in Turkey and found that the most important characteristic desired in a product or service was found to be authenticity. Additionally, healthcare was found to be the prioritized product or service group in transactions. It was observed that the priorities of older consumers in product and service groups changed when it is adressed from demographical characteristics perspective.

Sivri (2009) studied the suitability of Osborn (1988) model in Turkey by examining food-alcohol, semi-durable consumer goods and consumer non-durable goods expenditures which constitute the three sub-items of private final consumption expenditures and service expenditures. When there is no deterministic seasonal trend variable in regression equations, results of estimation rejected the Osborn model (1988). However, when the deterministic seasonal trend variable is included in regression equations and compared accordingly, estimation results showed difference depending on the series examined and in this case, Osborn model (1988) was found to be suitable with the data for service expenditures.

Özer, Akan and Çalmaşur (2010) conducted a survey in 900 students to examine the income-expenditure relationship of students in Ataturk University, the distribution of total expenditure with expenditure groups and the contribution of university students to the city economy. According to the survey results, food, clothing-shoes and housing expenditures are compulsory for students; transportation, communication, personal care, education, entertainment, socio-cultural, alcoholic beverages, cigarettes and tobacco products and other expenditures are found to be compulsory with their flexibilities very close to unit flexibility. Also, it was found that chance games expenditure is a luxury for students.

Demir and Armağan (2013) aimed to determine socio-economic characteristics and shopping preferences of households by conducting surveys in 384 families in urban areas of city of Aydin. Households were examined in five groups of 20% from low-income group to high-income group and fundamental statistical methods were used such as percentile, average, and standard deviation. In the econometric analysis of expenditures, two stage estimation method of Heckman was used. They found a statistically significant finding about low-income households paying attention to price component. Income flexibility was calculated 0.70 for food group while income flexibility of sub-groups were calculated as 0.17 for grain group, around 0.70 for meat-

fish, milk-cheese-egg, vegetables and fruits, sugar-honey, tea-coffee and non-alcoholic beverages; 0.96 for oil group and 1.24 for out-of-home food.

Murugasu et al. (2013) examined marginal consumption patterns of low and high-income households and differences of patterns between income groups by using household expenditure survey in Malaysia. The study showed that the marginal propensity of consumption of low income groups are higher than the marginal propensity of consumption of high income groups and the marginal propensity of consumption coefficient is 0,25 for groups with income higher than $10,000 and 0,81 for the group with income less than $1,000.

The second group studies that examined the income-consumption relationship are based on time-series analysis. Sousa (2003) analyzed the effect of the stock market, which is an indicator of private consumption, on wealth by using three month-economic data of the USA between 1952 and 2001, and examined the long-term relationship. According to the results of the analysis, the effect of stocks on wealth was anticipated as 3.5 compared to the effect on internet bonds. Thus, it was found that the positive (negative) effect of stock market on income would increase (decrease) the consumption 3.5 times.

Demiral (2007) made a consumption function estimation for Turkish economy between 1980 and 2005 with the data gathered from Turkish Statistical Institute. This study aimed to reveal the macro-economical functional relationship between total non-durable and semi-durable good consumption, and salary and prices. Despite the changes in total salary and prices that are calculated by basing it on 1987 prices, food, alcoholic beverage, non-durable and semi-durable good consumption amount does not show a strong concordance with these fluctuations. This discordance results from using basic consumption goods for the majority of goods that constitute total consumption amount in this model used in the study.

Pehlivan and Utkulu (2007), examined Turkey's consumption function with the data gathered from the Central Bank of Turkish Republic between 1987 and 2006. Gweke and Porter-Hudak (1983) determined that consumers in Turkey behave according to the Life-Cycle and Permanent Income Hypotheses by using partial conintegration approach.

Okcu (2008), examined the income-consumption relationship for Turkey with the income and consumption data gathered from Central Bank of Turkish Republic for the years between 1987 and 2007 by using cointegration analysis. According to this study, it was found that changes in income in Turkey do not impact consumption. When short-term and long-term relationship dynamics were examined in the study, it was seen that both variables do not act together and are not affected by each other.

Şengül and Sigeze (2013) calculated the income-demand flexibility of consumption goods by estimating parameters related to household consumption demand in Turkey by using

2005-2009 household budget survey micro dataset compiled by Turkish Statistical Institute. When considered as a whole, it was determined that the expenditure flexibilities of food and non-alcoholic beverages, clothing and shoes, housing, water, electricity, fuel, furniture and house gear, communication, alcoholic beverages, cigarettes and tobacco product groups were smaller than 1. In other words, it was observed that these good groups are classified as compulsory goods group in Turkey. Also, the expenditure flexibility of good groups such as healthcare, transportation, culture and entertainment, restaurant, hotel and patisserie are bigger than 1 and therefore, can be classified as luxury goods.

Özkul and Tapşın (2010) conducted a study on the Turkish economy in regards to the effect of the use of credit cards and disposable income on consumption for the years between 1998 and 2009 with the data they gathered from the Central Bank of Turkish Republic. The results showed that a 1% increase in disposable income will result in 64% increase in consumption while a 1% increase on credit card use will result in a 0,09% increase on consumption. Therefore, increase of disposable income results in a greater impact on consumption compared to credit card use.

Alimi (2013), examined the income-consumption relationship from the absolute income theory aspect for Nigeria between 1970 and 2011 with the data gathered from the World Bank. According to the results, income-consumption relationship is consistent with the Keynesian view and increase in income results in a decrease in average consumption propensity.

Altunoz (2014) estimated the consumption function related to the absolute income theory and researched how the theory is effective in explaining income-consumption relationship for Turkey with the data gathered from the Central Bank of Turkish Republic. In the study, Engel-Granger cointegration and Johansen cointegration tests were used and it was found that there is no cointegration, meaning that variables do not act together in the long-term. According to Granger causality analysis, income-consumption series are not Granger causality for each other. According to all these findings, it is determined that income is not a sufficient variable to explain consumption alone.

Although there exists many studies based on survey and time-series analysis on income-consumption analysis, there are a limited number of studies based on panel data analysis. Khan (2004) examined the effect of income distribution on consumption in twenty developing countries between 1975 and 1979. The result of income distribution increases the total consumption supports the Keynesian view.

Dreger and Reimer (2006) addressed the long term relationship between private consumption expenditures and disposable income in their study conducted in England and Euro zone. In the study, Pedroni's (1998) common model statistics rejects the null hypothesis of Kao

and McCoskey (1998) where there is cointegration while it rejects the null hypothesis where there is no cointegration. However, cointegration vector is reflected as a decrease in savings over time. All tests support the existence of a relationship in the long term and show that income flexibility is more compatible with permanent income hypothesis.

Romero (2008) examined the income-consumption relationship with panel unit root and stability analysis in 23 OECD countries between 1960 and 2005. According to the findings, it was found that the panel unit root tests cannot control structural break. Thus, a 1% change in income causes a 0,69 unit change in the same direction in consumption change.

Arıoğlu and Tuan (2011) examined income-consumption relationship in terms of absolute income theory for the countries Austria, Belgium, the United States of America, Denmark, Finland, Germany, Italy and England. It is decided that there is cointegration for the panel among countries and error correction model was estimated. According to the estimation results, the coefficients calculated for Italy, England and USA support the absolute income theory.

Öksüzkaya (2013) studied the income-consumption relationship for selected European Union (EU) countries between 1996 and 2010 with the world development indexes gathered by the World Bank from international resources. In this study, Breitung and Hadri panel unit root test was used to determine if the income and consumption variable is stationary in the EU countries. When the variables are considered as a whole, they were found to be stationary. According to the Hausman test statistics, the most suitable model for income and consumption variables was found to be the fixed effects model. A 1% change in income causes a 0,78 unit change in the same direction in the consumption variable.

METHODOLOGY

The Data and Survey

The world economy witnessed substantial transformation from the 1980s and onwards. Throughout the period individual economies also underwent significant structural changes along with the liberalization of international trade and capital movements. This study examines the income-consumption relationship in the EU and OECD countries for the 1980-2013 period. 16 countries from the EU which have data, Germany, Austria, Belgium, United Kingdom, Bulgaria, Denmark, Finland, France, Holland, Spain, Sweden, Italy, Greek Populated Southern Cyprus, Luxembourg, Portugal and Greece were included in the analysis. For the OECD countries, panel average is taken for 26 countries which have data and countries that have a panel consumption average of $22,900 and with the income more than $31,171 that are Germany, USA, Austria, Belgium, United Kingdom, Denmark, Finland, Netherlands, Ireland, Sweden,

Switzerland, Iceland, Japan, Luxembourg and Norway were categorized as *OECD I group.* Similarly, Australia, France, Spain, Italy, Canada, Republic of Korea, Mexico, Portugal, Chile, New Zealand and Greece that are below the averages of panel consumption and income, were categorized as *OECD II* group. As the time span of data matters for the consumption analysis we used the longest available data for the countries in the panel.

In the study, as a representative of consumption, 2005 prices and final consumption expenditures were divided by the population variable to calculate consumption expenditures per person and as a representative of income, 2005 prices and gross domestic product (GDP) per person were used as variables. Data used in the studies were taken from World Development Indicators.

The Model

In the model created for the analysis of income-consumption relationship, consumption expenditures per person is shown as *C* and GDP per person is shown as *Y.* Natural algorithms of variables are calculated. Thus, the consumption equation can be written as follows:

$$lnC = C_0 + clnY$$

Here, *lnC* shows consumption per person; C_0 shows autonomous consumption; *c,* marginal consumption propensity and *lnY* shows GDP per person.

ANALYTICAL APPROACH

In order to determine the level of integration of series and which method to use to determine the cointegration relationship between series in the panel data analysis, first the existence of cross-sectional dependence needs to be determined. Within this context, tests in panel data literature are divided into two as first and second order tests depending on the focus on cross-sectional dependence. First order unit root tests assume that the error terms of cross-sections constituting the panel are independent and are affected from explanatory variables by equal coefficients. Thus, first order tests will give deviated results in the event of cross-sectional dependence. Therefore, cross-sectional dependence should be tested first (Bedir and Soydan, 2014:4).

Cross-Sectional Dependence Test

It is important to consider cross-sectional dependence if a country is highly integrated and has a high level of globalization in its economic relationships. Cross-sectional dependence can be defined as a shock that happened at a point in time in the country *i* affecting the country *j* at that point of time or in the future (Nazlioglu et al., 2011:6618). Presence of cross-sectional

dependence can be examined with Breusch-Pagan (1980) CD_{LM1} and Pesaran (2004) CD_{LM2} tests when it is T>N while it can be examined with Pesaran (2004) CD_{LM} test when it is N>T (Hsiao, 2003:7). As this study is suitable for the T>N specification, Breusch-Pagan (1980) CD_{LM1} test was used. Cross-sectional dependence test can be used for both variable and the model. Breusch-Pagan (BP, 1980) CD_{LM1} statistics can be calculated as follows:

$$LM = T \sum_{i=j}^{N-1} \sum_{j=i+1}^{N} \hat{P}_{ij}^2 \sim X_{N(N-1)/2}^2$$

Here P_{ij} is the simple correlation coefficient between residuals that are obtained from estimations done by the least squares method on each equation. During the test process, the *Ho* hypothesis is: $H_0 = \alpha_2 = \alpha_3 = \cdots = \alpha_p = 0$. Acceptance of H_0 hypothesis means that there is no cross-sectional dependence and the shock happened in the *i* country does not affect the *j* country at that point of time or in the future. *LM* statistics under the null hypothesis where there is no correlation between residues show chi-square distribution while *N* is constant and *T* is infinite (Peseran, 2004:4).

The presence of cross-sectional dependence in the series was examined with Breusch-Pagan (1980) CD_{LM1} test and the results are shown in table 1. When the test results for EU are examined, as the *p-value* is <0.05 for the consumption and income variables in both fixed, and fixed and trended models, H_0 hypothesis was rejected. It was decided that there is cross-sectional dependence for the series. When the test results for OECD countries are examined, as the *p-value* is <0.05 for the consumption and income variables for both fixed and fixed and trended models, H_0 hypothesis was rejected. It was decided that there is cross-sectional dependence for the series.

Table 1: Breusch-Pagan (1980) CD_{LM1} Test Results

Variables	*AB*			
	Constant		Constant and Trend	
	Test Statistics	*p-value*	*Test Statistics*	*p-value*
lnC	284.588	0.000	301.510	0.000
lnY	195.359	0.000	209.610	0.000
		OECD I		
lnC	172.728	0.000	185.278	0.000
lnY	189.100	0.000	195.487	0.000
		OECD II		
lnC	87.096	0.000	98.633	0.000
lnY	108.154	0.000	154.383	0.000

Panel Unit Root Test

The main rule of making a significant relationship in an economic model lies on the stationarity of the series that is analyzed. When economic analyses are performed on non-stationary series of variables, the results will appear as spurious regression (Tarı, 2010:374). If the series is not stationary, then *t* and *f* tests and R^2 values can be partial. Therefore, the series to be analyzed should be made stationary (Gujarati, 1999:707). Unit root tests that pay attention to cross-sectional dependence are called second order unit root tests. In this study, the stationarity of variables is examined by Pesaran's (2007) Cross-Sectionally Augmented Dickey Fuller –CADF test. Pesaran (2007) developed a panel unit root test that pays attention to cross-sectional dependence which provides easy application rather than the estimation of factor structures of error terms. Pesaran expanded the Dickey-Fuller (DF) or expanded Dickey-Fuller (CADF) regressions by cross-sectional average level of time lag and individual series whose first differences are taken (Güloğlu and İvrendi, 2010:383). During the testing process, the residual series is defined as:

$$\Delta Y_{it} = \alpha_i + P_i Y_{it-1} + C_i \bar{Y}_{t-1} + d_i \Delta \bar{Y}_t + v_{it}$$

The $\bar{Y}_{t-1}$ ve $\Delta \bar{Y}_t$ in the equation is obtained from the equations below:

$$\bar{Y}_{t-1} = (\frac{1}{N}) \sum_{i=1}^{N} Y_{it-1}$$

$$\Delta \bar{Y}_t = (\frac{1}{N}) \sum_{i=1}^{N} \Delta Y_{it}$$

P_i shows the least square estimator and $t_i(N,T)$ shows the *t*-statistics. The Cross-Sectionally Augmented Dickey Fuller statistics that Pesaran (2007) is based on is defined as CADF. CADF statistics is shown in the equation below:

$$t'_i(N,T) = \begin{cases} K_1 & t_i(N,T) \leq K_1 \\ t_i(N,T) & K_1 < t_i(N,T) < K_2 \\ K^2 & t_i(N,T) \geq K_2 \end{cases}$$

When K_1 and K_2 is close to one, the probability of $t_i(N,T)$ is invariant and has an invariant probability like K_1 and K_2 (Hurlin and Mignon, 2006:19). The hypothesis of the test is $H_0: \beta_i = 0$ $(There\ is\ unit\ root)$.

To determine if there is a unit root, arithmetical average of CADF statistics is taken and the CIPS statistics for panel is calculated with the formula below:

$$CIPS = \frac{\sum_{i=1}^{N} CADF_i}{N}$$

After the test, calculated CIPS statistics is compared with the Pesaran (2007) table values. When the calculated CIPS value is smaller than the table value, H_0 is rejected and thus, it is determined that there is no unit root in the series (Nazlioglu, 2010:92). Additionally, according to the individual CADF test, the strength of the CIPS test is higher (Barbieri, 2006:27-30).

As there is cross-sectional dependence in the series, the stationarity of the series is examined with the CADF test which is one of the second order unit root tests. For the EU countries, CADF unit root test results are presented in table 2. As the calculated test statistic for level values of variables are bigger than the critical value for both fixed and fixed and trended, H_0 unit root hypothesis was accepted. Therefore, the first differences of series are taken and H_0 hypothesis is rejected as the test statistic calculated in both fixed and fixed and trended models are smaller than the critical value. It is decided that the difference in the 1% significance level of consumption and income variables in the EU countries is stationary (I(1)).

Table 2: CADF Test results for EU countries

Variables	Constant			Constant and Trend		
	CİPS Statistics	*Critical Value*		*CİPS Statistics*	*Critical Value*	
lnC	-1.477	%1	-2,45	-1,419	%1	-2,96
lnY	-1.688	%5	-2,25	-1.937	%5	-2,76
∆*lnC*	-3.086*	%10	-2,14	-3.157*	%10	-2,66
∆lnY	-2.974*			-3.378*		

Note: ** and *** show that the series are stationary at %1, %5 and %10 significance levels respectively. The number of lag is considered as 3.

CADF test results for OECD countries are presented in table 3. As the calculated test statistics of level values of variables in the OECD I group are bigger than the critical value for both fixed and fixed and trended, the H_0 unit root hypothesis is accepted. Therefore, the first differences of series are taken. As the calculated test statistics for both fixed and fixed and trended models are smaller than the critical value, H_0 hypothesis is rejected and it is decided that the difference in the 1% significant level of consumption and income variable is stationary (I(1)). The calculated test statistics in the fixed models and the fixed and trended models in OECD II are smaller than the critical value, H_0 hypothesis is rejected and it is decided that the consumption and income variable is stationary (I(0)) at the 1% significance level.

Table 3: CADF Test Results for OECD Countries

Variables	OECD I					
	Constant			Constant and Trend		
	CİPS Statistics	*Critical Value*		*CİPS Statistics*	*Critical Value*	
lnC	-2.037	%1	-2.45	-1.915	%1	-2.96
lnY	-1.847	%5	-2.25	-1.883	%5	-2.76
∆lnC	-3.173***	%10	-2.14	-3.312***	%10	-2.66
∆lnY	-2.948***			-3.161***		
	OECD II					
lnC	-5.938***	%1	-2.57	-5.974***	%1	-3.10
lnY	-5.854***	%5	-2.33	-5.893***	%5	-2.86
		%10	-2.21		%10	-2.73

Note: *, ** and *** show that the series are stable at %1, %5 and %10 significance levels, respectively. Lag value is considered 3. ∆ is the differencing unit.

Cointegration

The approach that prevents information loss and lack of solution due to differencing in long-term series is called cointegration approach (Göktaş, 2005:113). Cointegration analysis suggests that even if the economic series are not stationary, it is possible that there is a stationary, linear combination of these series and if there is, it can be determined econometrically. This relationship shows a long-term balance relation between variables despite the permanent exogenous shocks that affect variables. Each variable in the system should have common stochastic trends that affect these altogether rather than having individual, permanent shocks that are uniquely exogenous and affect each one separately. If non-stationary two time-series are integrated at the same level, a cointegration can happen between the two series and the regression between these two series original values would not be spurious but significant (Tarı, 2011:415). Durbin-H and Westerlund ECM Bootstrap cointegration tests were used in this study to test the cointegration.

Durbin-Hausman (Durbin-H) Panel Cointegration Test

Westerlund (2008) Durbin-H method is a method that can be used to test the presence of cointegration in panel analysis when there is cross-sectional dependence in between the series. This method allows independent variables to be *I(1)* or *I(0)* as long as the dependent variable is *I(1)* (Westerlund, 2008:193-233). Westerlund (2008) Durbin-H method tests the existence of cointegration relationship at the group and panel dimensions. Westerlund (2008) Durbin-H group test allows autoregressive parameter to differentiate in between sections. Rejection of H_0

hypothesis in this test means that there is cointegration relationship at least for some sections. In the Westerlund (2008) Durbin-H panel cointegration test, autoregressive parameter is accepted as same for all sections. With this assumption, when H_0 hypothesis is rejected, it is accepted that there is cointegration relationship for all sections (Bayar and Taşar, 2012:257-262). The test of the hypothesis is as follows: $H_0: \emptyset_i = 1\ (No\ cointegration\ relationship)$. The decision on rejection or acception of hypothesis is made by comparing the obtained test statistics with the normal distribution table critical values (Altintaş and Mercan, 2015:365). If the test statistic is bigger than the critical value, then the H_0 hypothesis is rejected and the existence of cointegration is decided.

Westerlund ECM Bootstrap Panel Cointegration Test

Westerlund's (2007) Error Correction Model (ECM) developed a conditional error correction model revealing whether the error-correction term (α_i) equals zero or not in order to test the null hypothesis. Rejection of the null hypothesis means there is no cointegration. Simulation results show that small sampling performances of Westerlund's tests are stronger than other residual based cointegration tests (Nazlioglu, 2010:94). The model in this test process can be defined as follows:

$$\alpha_i(L)\Delta Y_{it} = \delta_{1i} + \delta_{2it} + \alpha_i\left(Y_{it1} - \beta'_i X_{it-1}\right) + Y_i(L)'^{V_{it}} + e_{it}$$

$\delta_{1i} = \alpha_i(1)\emptyset_{2i} - \alpha_{i\emptyset 1i} + \alpha_i\emptyset_{2i}$ *ve* $\delta_{2i} = -\alpha_{i\emptyset 2i}$ and there are deterministic terms here. *L* is the lag unit. For this model to be consistent, $Y_{it-1} - \beta'_1 X_{it-1}$ should be stationary. Here, β1 vector defines the long-term balance relationship between X_{it} and Y_{it}. Thus, error terms, v_{it} and e_{it} are stationary as well.

In this model, α_i is an error correction parameter and in the case of $(\alpha_i < 1)$, there is error correction mechanism and Xit and Y_{it} are cointegrated. If $(\alpha_i = 1)$, error correction mechanism will not work and there will not be cointegration relationship (Göçer, 2014:227). Westerlund developed four tests to test this situation. The first two of these tests are based on information pooling about error correction along the cross-section of the panel called panel statistics. The other two test statistics are called group mean statistics and use this present information. Null hypothesis for panel statistics is $H_0: \alpha_i = 0$. Rejection of H_0 for the whole panel indicates cointegration. Null hypothesis for group mean statistics is $H_0: \alpha = 0$. In this case, rejection of H_0 indicated cointegration for at least one of the units that constitute the panel (Özcan, 2015:8).

According to the unit root test results of EU countries, all variables are I(1) which suggests that there might be a long-term relationship in between. The existence of relationship was first examined by Durbin-H cointegration test and then with Westerlund ECM-Bootstrap test. Test results are presented in table 4. According to the Durbin-H test results, H_0 hypothesis

that shows there is no cointegration, was accepted for the group but rejected for the panel. Therefore, there is no clear implication regarding the existence of cointegration and cointegration relationship was examined with Westerlund ECM-Bootstrap test. According to the results of ECM-Bootstrap, H_0 hypothesis that shows no cointegration for both group and the panel, was rejected and it was decided that there is cointegration between variables.

Table 4: Results for the EU Countries

Durbin-H Cointegration Test				
Tests	*Test Statistics*		*p-value*	
DH_g	-0.010		0.504	
DH_p	1.885		0.030	
Westerlund ECM-Bootstrap CointegrationTest				
Tests	Constant		Constant and Trend	
	Test Statistics	*p-value*	Test Statistics	*p-value*
g_tau	-6.118	0.000	-5.208	0.012
g_alpha	-9.456	0.000	-9.740	0.000
p_tau	-2.867	0.218	-7.110	0.015
p_alpha	-4.979	0.078	-12.314	0.003

Durbin-H and Westerlund ECM-Bootstrap cointegration test results for *OECD I* countries are presented in table 5. The H_0 hypothesis that shows no cointegration was accepted for the group and rejected for the panel. Therefore, there is no clear implication of cointegration. Cointegration relationship was examined with Westerlund-Bootstrap test. According to the ECM-Bootstrap results, H_0 hypothesis that shows no cointegration for both the group and the panel, was rejected and it was decided that there is cointegration between variables.

Table 5: Results for the OECD I Countries

Durbin-H Cointegration Test				
Tests	*Test Statistics*		*p-value*	
DH_g	-0.930		0.824	
DH_p	2.541		0.006	
Westerlund ECM-Bootstrap CointegrationTest				
Tests	Constant		Constant and Trend	
	Test Statistics	*p-value*	Test Statistics	*p-value*
g_tau	-4.035	0.021	-2.286	0.269
g_alpha	-7.604	0.000	-4.984	0.09
p_tau	-2.828	0.152	-2.109	0.319
p_alpha	-6.698	0.006	-5.699	0.014

As all variables in the *OECD II* group were I(0), the cointegration relationship was not examined. As a result, it was decided that long-term coefficients can be predicted as there is cointegration between variables both for EU countries and *OECD I* countries. In other words, series act together in the long term and that's why there will be no problem about spurious regression in the predictions to be made with level values. As all variables in *OECD II* group are I(0), it was decided to make estimations with CCE estimator without examining the cointegration relationship between variables.

Homogeneity and Cross-Sectional Independence Tests for the Model

Homogeneity test determines whether the slope coefficient in the cointegration equation is homogenous or not. First studies in this subject started with Swamy (1970). Later, Pesaran and Yamagata (2008) developed the Swamy test. During this process, in a general cointegration equation, β_i curve coefficients are tested to see if they are different in between cross-sections (Peseran and Yamagata, 2008:8). $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ test statistics to be used to test homogeneity can be shown as:

$$\tilde{\Delta} = \sqrt{N}\frac{N^{-1}\hat{\mathrm{S}} - k}{\sqrt{2k}}$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\frac{N^{-1}\hat{\mathrm{S}} - E(\check{\mathrm{Z}}_{it})}{\sqrt{Var(\check{\mathrm{Z}}_{it})}}$$

Null hypothesis for the delta test can be shown as $H_0: \beta_1 = \beta_2 = \cdots = \beta_N = \beta\ (For\ all\ \beta_i's)$
Acceptance of H_0 hypothesis shows homogeneity (Peseran and Yamagata, 2008: 50-93).

In order to choose the suitable estimator to be used in long-term coefficient estimations and to determine if there is cross-sectional dependence and homogeneity in the income-`consumption model, Breusch-Pagan (1980) cross-sectional dependence test and Pesaran and Yamagata (2008) delta tests were used. The results are presented in table 6. According to the Breusch-Pagan (1980) CD_{LM1} test results, H_0 hypothesis where there is no cross-sectional dependence, was rejected for both EU and OECD countries and it was decided that estimators that consider cross-sectional dependence in model estimation should be used. When the homogeneity test results are examined in each country group, "H_0: Homogeneity" hypothesis was rejected according to the $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ test results and it is decided that there is heterogeneity.

Table 6: Results of Breusch-Pagan (1980) CD_{LM1} and Homogeneity Tests for Income-Consumption Model

Group	CD_{LM1}		$\tilde{\Delta}$		$\tilde{\Delta}_{adj}$	
	Test Statistics	*p-value*	Test Statistics	*p-value*	Test Statistics	*p-value*
AB	566.441	0.000	45.896	0.000	47.999	0.000
OECD I	666.970	0.000	35.042	0.000	36.647	0.000
OECD II	232.154	0.000	22.514	0.000	23.546	0.000

Prediction of Long-Term Cointegration Coefficients

Common Correlated Effects (CCE) method was developed by the first estimator Pesaran and it estimates cointegration coefficients when there is cross-sectional dependence. CCE estimator can obtain asymptotic results that provide consistent normal distribution for *T > N* and *N > T,* and calculate long-term balance coefficients for cross-section units (Peseran, 2006:346). Estimators of this model consider the effect of factors, not included in the econometric model, by regression equations augmented by time-vector of each cross-section. CCE method is based on the heterogeneous panel data regression model below.

$$Y_{it} = a_i d_t + b_i X_{it} + e_{it}$$

$$E_{it} = YF_t + \varepsilon_{it}$$

Here, *d* represents observed and *F* represents unobserved common factors. CCE estimators assume that independent variables and unobserved common factors are stationary and exogenous but they are consistent when these are stationary *I(0)* or first order cointegrated (Nazlioglu, 2010:101, Pesaran and Yamagata, 2011:50-51).

Two separate estimators were developed in the CCE model. The first estimator is Common Correlated Mean Group Effects (CCMGE) estimator while the other is Common Correlated Pooled Effects (CCPE) estimator (Erataş and Nur, 2013:16). In the CCMGE approach, long-term parameters of explanatory variables are calculated by arithmetic mean of coefficients in every cross-section (Pesaran-Yamagata, 2008:50-51). Thus, it is calculated as:

$$b_{CCMGE} = \frac{1}{N}\sum_{i=1}^{N} b_i$$

b_i is the CCE estimator for every cross-section in the equation above. In the CCPE approach, it is shown as:

$$b_{CCPE} = \left\{\sum_{i=1}^{N} Q_i X_i M_w X_i\right\}^{-1} \leftarrow \sum_{i=1}^{N} Q_i X_i M_w X_i$$

It was observed in the Monte Carlo simulation that CCMGE and CCPE estimators provide effective results even in the smallest sample. CCPE estimator gives more effective results in small samplings compared to the CCMGE estimator (Eberhardt and Bond, 2009:1). CCE estimators are shown to be more efficient than methods that do not consider unobserved common factors, in other words cross-section dependency. One of the advantages of the CCE method is that long-term regression coefficients can be calculated for each cross-section unit (Nazlioglu, 2010:102).

Estimators that consider cross-sectional dependence and heterogeneity should be preferred in long-term coefficient estimations. Therefore, Pesaran (2006) CCE estimator was used in this study. CCE estimator is an estimator that can obtain asymptotic results that provide consistent normal distribution for $T > N$ and $N > T$ and calculate long term balance coefficients (Pesaran, 2006: 346).

Two different estimators, CCMGE and CCPE were developed in the CCE model. As there is heterogeneity in the EU countries, CCMGE estimator was used as it provides results for both panel and cross-section in long-term coefficient estimations. The results are presented in table 7. According to the results, the long-term regression coefficient for income-consumption for panel was found 0.611. A 1% increase in the income results in a 0.611% increase in consumption. Estimation results for cross-sections show that coefficient for Austria, Belgium, United Kingdom, Denmark, Finland, Greek populated Cyprus, Netherlands, Spain, Sweden, and Luxembourg was found statistically significant and positive. Marginal consumption propensity coefficient is between 0.176 and 0.791. Also, the smallest marginal consumption propensity coefficient belongs to Greek populated Cyprus and the biggest coefficient belongs to the United Kingdom.

Table 7: CCMGE Estimation Results for Panel and Cross-Sections in the EU Countries

Countries	lnY	Standard Error	t statistics
Germany	0.593	0.059	1.005
Austria	0.462	0.075	6.16
Belgium	0.776	0.227	3.419
United Kingdom	0.791	0.177	4.469
Bulgaria	1.088	0.089	1.222
Denmark	0.406	0.16	25.375
Finland	0.533	0.058	9.190
France	0.49	0.108	4.537
Netherland	0.627	0.157	3.994
Spain	0.756	0.124	6.097
Sweden	0.417	0.054	7.722
İtaly	0.817	0.074	1.104

Table 7…

Cyprus	0.176	0.057	3.088
Luxemburg	0.364	0.085	4.282
Portugal	0.729	0.053	1.376
Greece	0.746	0.055	1.356
Panel	0.611	0.056	10,88

As the slope coefficient for *OECD I* country group is heterogeneous, CCMGE estimator was used as it considers cross-sectional dependence and heterogeneity. The results are presented in table 8. Results show that the long-term regression coefficient between income and consumption is 0.471 for the panel. A 1% increase in income results in a 0.471% increase in consumption. Estimation results for cross-sections show that coefficient is statistically significant and positive in all countries but Norway and Switzerland. The marginal consumption propensity coefficient is between 0.282 and 0.931. Also, the smallest marginal consumption propensity coefficient belongs to Denmark and the biggest coefficient belongs to Belgium.

Table 8: CCPE Estimation Results for Cross-Section and panel in *OECD I* Countries

Countries	*lnY*	Standard Error	*t statistics*
Germany	0.627	0.076	8.250
USA	0.391	0.104	3.760
Austria	0.661	0.124	5.331
Belgium	0.931	0.183	5.087
United Kingdom	0.657	0.223	2.946
Denmark	0.282	0.130	2.169
Finland	0.444	0.067	6.627
Netherland	0.657	0.119	5.521
Sweden	0.348	0.055	6.327
Switzerland	0.188	0.120	1.567
Ireland	0.477	0.053	9.000
Island	0.480	0.098	4.898
Japan	0.536	0.049	10.939
Luxemburg	0.398	0.064	6.219
Norway	-0.015	0.209	-0.072
Panel	0.471	0.059	8.013

As the slope coefficient is heterogeneous for the *OECD II* country group, CCMGE estimator was used and the results are presented in table 9. According to the results, the long-term regression coefficient between income-consumption is found 0.782 for the panel. A 1% increase in income results in a 0.782% increase in consumption. According to the estimation results of cross-sections, the coefficient was found statistically significant and positive in all countries. The marginal consumption propensity coefficient is between 0.593 and 0.978. Also, the smallest

marginal consumption propensity coefficient belongs to Republic of Korea and the biggest coefficient belongs to Chile.

Table 9: CCPE Estimation Results for Cross-Section and Panel for *OECD II* Countries

Countries	*lnY*	Standard Error	*t statistics*
Australia	0.789	0.049	16.102
France	0.600	0.114	5.263
Spain	0.874	0.029	30.138
İtaly	0.832	0.051	16.314
Canada	0.886	0.065	13.631
Korea R.	0.593	0.111	5.342
Mexico	0.761	0.086	8.849
Portugal	0.776	0.050	15.520
Chile	0.978	0.143	6.839
New Zeeland	0.777	0.073	10.644
Greece	0.735	0.061	12.049
Panel	0.782	0.035	22.626

CONCLUSION

The fundamental of economic activities is to provide production of goods and services that meets the biological and socio-cultural needs of people. For this reason, consumption is one of the leading subjects of economic theory. In this study, income-consumption relationship was examined with the data from 1980-2013 period for 16 EU and 26 OECD countries that have data.

According to the results, the long-term regression coefficient between income and consumption was found 0.611 for EU. So, a 1% increase in income causes a 0.611% increase in consumption. Additionally, the marginal consumption propensity coefficient for EU countries is between 0.176 and 0.791. The smallest coefficient belongs to Greek Populated Cyprus while the biggest coefficient belongs to the United Kingdom.

The long-term regression coefficient between income and consumption for *OECD I* countries was found to be 0.471. So, a 1% increase in income causes a 0.471% increase in consumption. The marginal consumption propensity coefficient is between 0.282 and 0.931. The smallest coefficient belongs to Denmark while the biggest coefficient belongs to Belgium. For the *OECD II* countries, the long-term regression coefficient between income and consumption is 0.782. A 1% increase in income causes a 0.782% increase in consumption. The marginal consumption propensity coefficient is between 0.593 and 0.978. Also, Republic of Korea was found to have the smallest marginal consumption propensity coefficient while Chile was found to have the biggest.

As a result, it can be said that the Absolute Income Theory, in other words Keynesian view, is valid in EU and OECD countries. Additionally, when EU, OECD I and OECD II groups are compared, the marginal consumption propensity is low in OECD I countries that have high income average while the coefficient is higher in the OECD II group that has a lower income average. Therefore, it was found that the Keynesian hypothesis, that says relationship between income and consumption is positive and as income increases the average consumption propensity decreases, is valid. This result supports previous empirical studies with the result that developed countries have a lower marginal consumption propensity compared to developing countries.

REFERENCES

Alimi, R. S. (2013). Keynes Absolute Income Hypothesis and Kuznets Paradox, Adekunle Ajasin University, Akungba-akoko, MPRA Paper No 49610, Posted 26, Ondo State Nigeria.

Altıntaş, H. & Mercan, M. (2015). Ar-Ge Harcamaları ve Ekonomik Büyüme İlişkisi: OECD Ülkeleri Üzerine Yatay Kesit Bağımlılığı Altında Panel Eşbütünleşme Analizi, Ankara Üniversitesi Siyasal Bilgiler Fakültesi Dergisi, Cilt.70, No.2, ss.345-376.

Arıoğlu, E & Tuan, K. (2011). Test Of The Absolute Income Hypothesis İn USA and Europe, Ç.Ü. Sosyal Bilimler Enstitüsü Dergisi, Vol. 20, No 2, PP. 299-316.

Aşırım, O. (1996). Alternative Theories of Consumption and an Application to the Turkish Economy, Central Bank of the Republic of Turkey, Discussion Paper No: 9604, January.

Bayar, E. B. & Taşar, F. (2012). Research and Development: Source of Economic Growth, Procedia - Social and Behavioral Sciences, 58: 744-753.

Bedir, S.& Soydan, A. (2015). External debt and economic growth: evidence for an old debate, Journal of Business Economics and Finance, Press Academia, 4(3).

Breusch, T. & Pagan, A. (1980). The Lagrange Multiplier Test and Its Applications to Model Specification in Econometrics, Review of Economic Studies, 47(1), 239-253.

Bocutoğlu, E. (2011). Makro İktisat Teorileri ve Politikaları, 4. Baskı, Trabzon: Murathan Yayınevi.

Demiral, M. (2007). Türkiye Ekonomisi İçin Tüketim Fonksiyonu Tahmini, http://dergi.kmu.edu.tr/userfiles/file/aralik2007/PDF/19.pdf , (22.12.2014).

Demir, Y. & Armağan, G. (2013). Aydın'da Hanehalklarının Gıda Tüketim Talebi Ekonometrik Analizi, Ege Üniversitesi Ziraat Fakültesi Dergisi, 50(1), 97-107, İzmir.

Dreger, C. & Reimer, H-E. (2006). Consumption and Disposable İncome İn The EU Countries: The Role of Wealth Effects, Empirical Original Paper, DOJ 10.1007/s10663-006-9014-z, 3-10.

Dönek, E. (1996). Tüketim modellerinde Gelir Dağılımı ve Yaş Yapısı: İktisat Politikası Açısından Bir değerlendirme, Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 14(2), ss. 81-105.

Eberhardt, M. & Bond, S. (2009). Cross-Section Dependence İn Nonstationary Panel Models: A Novel Estimator, MPRA Paper 17692, University Park, Nottingham.

Eisner, M. (1958). The Permanent Income Hypothesis, American Economic Review.

Erataş, F. & Nur, H. B. (2013). Dış Borç Ve Ekonomik Büyüme İlişkisi: Yükselen Piyasa Ekonomileri Örneği, Marmara Üniversitesi İ.İ.B.F. Dergisi Cilt. XXXV, Sayı II, 207-230.

Göçer, İ. (2014). Ar-Ge Harcamalarının Yüksek Teknolojili Ürün İhracatı, Dış Ticaret Dengesi ve Ekonomik Büyüme Üzerindeki Etkileri, Maliye Dergisi, 164: 215-240.

Göktaş, Ö. (2005). Teorik ve Uygulamalı Zaman Serisi Analizi, 1. Baskı, İstanbul: Beşir Kitabevi.

Gujarati, D. N. (1999). Temel Ekonometri (Çev. Ü. Şenesen ve G. Şenesen), İstanbul, Literatür Yayıncılık.

Güloğlu, B. & İvrendi, M. (2010). Output Fluctuations: Transitory or Permanent? The Case of Latin America, Applied Economics Letters, 17, 381-386.

Hsiao, C. (2003). Analysis of Panel Data, Second Edition, University of Southern California.

Hurlin, C. & Mignon, V. (2006). Une Synthese des Tests de Racine Unitaire sur Donnes de Panel, Post-Print halshs-00078770.

Khan, M.H. (2004). Defense Expenditure and Macroeconomic Stabilization: Causality Evidence from Pakistan, State Bank of Pakistan Working Paper.

Klein, L. R. & Liviatan, N. (1957). The Significance of Income Variability on Saving Behavior, Oxford University, Institute of Economics and Statistics, Bulletin, 19, 156-60.

Mankiw, N. G. (2010). Makro Ekonomi, (Çev. Ömer Faruk Çolak), Ankara, Elif Yayınevi.

Marangoz, M. (2006). Yaşlı Tüketiciler ve Yaşlı Tüketicilerin Harcama Eğilimlerinin Belirlenmesine Yönelik Bir Araştırma, Yönetim Ve Ekonomi Dergisi, 13(1).

Mızırak, Z. (2005). Hane halkı Tüketim Harcamalarının Yapısal Analizi Konya İli Örneği, Yayınlanmamış Doktora Tezi, İstanbul Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

Murugasu, W. et al (2013). The Marginal Propensity to Consume across Household Income Groups, Bank Negara Malaysıa Working Paper Series WP2/2013, 3-20, Malaysia.

Nazlioglu, S. (2010). Makro İktisat Politikalarının Tarım Sektörü Üzerindeki Etkisi: Gelişmiş ve Gelişmekte Olan Ülkeler İçin Bir Karşılaştırma, (Yayımlanmamış Doktora Tezi), Erciyes Üniversitesi Sosyal Bilimler Enstitüsü, Kayseri.

Nazlioglu, S., Lebe, F. & Kayhan, S. (2011). Nuclear energy consumption and economic growth in OECD countries: Cross-sectionally dependent heterogeneous panel causality analysis, Energy Policy, 39.

Nişancı, M. (2003). Hanehalkı Harcamalarının Engel Eğrisi Analizi: 1994 Türkiye Kentsel Kesim Örneği, İstanbul Üniversitesi Siyasal Bilgiler Fakültesi Dergisi, 28.

Okcu, A. B. (2008). Türkiye İçin Gelir-Tüketim İlişkisinin Eşbütünleşme Analizi İle İncelenmesi, Yüksek Lisans Tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü, Adana.

Öksüzkaya, M. (2013). Seçilmiş AB Ülkeleri İçin Gelir-Tüketim İlişkisi: Panel Veri Yaklaşımı, Yüksek Lisans Tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü, Adana.

Özcan, B. (2013). The nexus between carbon emissions, energy consumption and economic growth in Middle East countries: A panel data analysis. Energy Policy, 62, 1138–1147.

Özer, H. (1992). Erzurum'da Tüketim Harcamalarının Ekonometrik Analizi, Erzurum, Atatürk Üniversitesi Sosyal Bilimler Enstitüsü (Yayımlanmamış Yüksek Lisans Tezi).

Özer, H. (2001). Erzurum'da Hanehalklarının Tüketim Kalıplarının Yapısı ve Gelir Hipotezlerinin Analizi, D.E.Ü.İ.İ.B.F Dergisi, 16(1), 35-46.

Özer, H, Akan, Y. & Çalmaşur, G (2010). Atatürk Üniversitesi Öğrencilerinin Gelir-Harcama İlişkisi, C.Ü. İktisadi ve İdari Bilimler Dergisi, 11(1), 231-249, Sivas.

Özkul, F. U. & Tapşın, G. (2010). Kredi Kartı Kullanımı İle Kullanılabilir Gelirin Tüketim Üzerindeki Etkisi Ve Türkiye Ekonomisi Üzerine Ampirik Bir Çalışma, Bahçeşehir Üniversitesi MYO, İstanbul.

Özmen, M. (1997). Türkiye İçin Tüketim Fonksiyonunun Ekonometrik Tahmini, Yüksek Lisans Tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü, Adana.

Pehlivan, G. (2006). Türkiye'nin Tüketim Fonksiyonu: Ekonometrik Uygulama, Yüksek Lisans Tezi, Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü, İzmir.

Pehlivan, G. & Utkulu, U. (2007). Türkiyenin Tüketim Fonksiyonu: Parçalı Hata Düzeltme Modeli Bulguları, Akdeniz İ.İ.B.F. Dergisi (14), 39-65.

Pesaran, M. H. (2004). General Diagnostic Tests For Cross Section Dependence İn Panels, Cesifo Working Paper 1229; IZA Discussing Paper 1240.

Peseran, M. H. (2006). Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure, Econometrica, 74(4), 967-1012.

Pesaran, M. H. & Yamagata, T. (2008). Testing slope homogeneity in large panels, Journal of Econometrics, 142.

Romero, A. D. (2008). A Confirmatory Analysis of the Unit Root Hypothesis for OECD Consumption–Income Ratios", Applied Economics, 40, 2271-2278.

Sivri, U. (2009). Mevsimsel Rasyonel Beklentiler Yaşam Boyu Sürekli Gelir Hipotezinin Testi, Ankara Üniversitesi SBF Dergisi, 64(4), Ankara.

Şengül, S. & Sigeze, C. Ç. (2013), "Türkiye'de Hanehalkı Tüketim Harcamaları: Pseudo Panel Veri İle Talep Sisteminin Tahmini", http://avekon.org/papers/709.pdf , (03.02.2015).

Tarı, Ç., Çalışkan, S. & Bayraktar, Y. (2006). Kocaeli Üniversitesi Öğrencilerinin Gelir ve Tüketim İlişkisi Üzerine Ekonometrik Bir İnceleme, Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi,11(1), http://kosbed.kocaeli.edu.tr/sayi11/gelirvetuketim.pdf (11.06.2014).

Tarı, R. (2011). Ekonometri, Gözden Geçirilmiş 7. Baskı, İzmit: Umuttepe Yayınları.

Türkmen, Ş. (1995). Tüketim Teorilerinin Karşılaştırılması, Yüksek Lisans Tezi, Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.

Uluatam, Ö. (1998). Makro İktisat, Genişletilmiş 9. Baskı, Ankara: Savaş Yayınları.

Ünsal, M. E. (2001). Makro İktisat, 4. Baskı, Ankara: İmaj Yayıncılık.

Ünsal, M. E. (2007). Makro İktisat, Genişletilmiş 7. Baskı, Ankara: İmaj Yayınevi.

Westerlund, J. & Edgerton, D. L. (2007). A Panel Boostrap Cointegration Test, Economics Letters, 97, 185-190.

Westerlund, J. (2008). Panel Coıntegratıon Tests of the Fisher Effect, Journal of Applıed Econometrıcs, Econ. 23.

Yıldırım, D., Karaman, D. & Taşdemir, M. (2012). Makro Ekonomi, Güncelleştirilmiş 10. Baskı, Ankara: Seçkin Yayınevi.