

# The Relationship Between Income and Consumption After Global Financial Crisis

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Global financial crisis which began with high default rates on subprime and adjustable rate mortgages, developed in 2007 and became visible after the crash of Lehman Brothers in 2008. Like other financial crises, it caused significant declines in consumer wealth. Although it started in US mortgage and state market, its effects are held all over the world. Generally, rich people have more ways to protect their assets than poor people do. So the negative effects of financial crisis (such as decreasing income) are lower for rich persons. One of the most important questions, which arose after the global financial crisis, asked if the burden of recession is felt by all people in the world or region, equally. The aim of this study is to reveal the effects of financial crisis on Turkish university students with different income levels when Turkish economy is collapsing. So we can learn if income distribution between students is deteriorated or not. To realize this aim, the survey which includes 36 questions are applied to students in a private university vocational school of economics and administrative sciences programmes and in a public university school of EASF economics programme. The survey is analyzed by SPSS 16.00 statistical package programme.

*Keywords:* income consumption relationship, financial crisis, Engel's law

## Introduction

We are witnessing an economical and financial crisis which causes recession, decline in economical activities and bankruptcy of financial institutions. Economists and policy makers have been benchmarking 1929 Great Depression and 2007 global financial crisis<sup>1</sup> (Öz, 2009, pp. 1-2; Ünal & Kara, 2009, pp. 8-9). As a result of this benchmarking, economists observed that the crises in the emerging market economies since the late 1990s were more global, potentially more damaging and dangerous for economic and political stability than the crises of the past (Feldstain, 2002, p. 2). Because of the globalization, the effects of the crisis are not limited to a few countries. Although the crisis started in US mortgage market, its effects were held all over the world (Birdal, 2009, p. 2). Empirical studies showed that majority of the currency crises have been contradictory (Gupta et al., 2003, p. 3). So Turkish economy was effected negatively from this crisis and GDP was declined 3.3% in the third

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<sup>1</sup> Reinhart and Rogoff (2008) benchmarked 2007 US crisis with other financial crises which were occurred in late 1900s.

quarter of 2009 (TUİK, 2009).

Economic theory mentioned that because of the declines in income, consumption of households decreases. The relationship between income and consumption was investigated by Keynes, Engel, Kuznets, Duesenberg, Friedman, Modigliani and many others (Tarı & Çalışkan, 2005, p. 2).

In this study we searched the effects of 2007 global financial and economic crisis on university pupils. Also we asked which consumption items decreased after crisis and examine about income elasticities and Engel functions. To realize this aim, we applied an survey to pupils at Beykent University Vocational High School Economics Administrative Programme and Marmara University Economics and Administrative Faculty Economics department. Inside of the text we call them as Public University and Private University Pupils.

### 2007 Global Financial and Economic Crisis

US economy have started to experience a striking contraction in wealth, an increase in unemployment and a decrease in GDP since 2007. The roots of this crisis are decreasing US house prices that cause higher default rates for financial institutions. The bursting of the US housing bubble, which occurred in approximately 2005-2006, was the main reason of this crisis. Long term trend of rising US housing prices encouraged financial institutions to lend without considering the risks. Loans became too easy for US mortgage consumers. Shortly, easy credit conditions contributed to this housing bubble. Mortgage-Backed securities (MBS), whose value came from mortgage payments and housing prices, increased. This bubble enabled global financial institutions and investors around the world to invest in the US housing market. In this period subprime lending expanded dramatically. The borrowers, who have weakened creditability and greater risk of loan default, are called subprime borrowers in US banking sector. Major US banks and government sponsored enterprises supported this subprime lending.

Table 1

#### *Comparison of Turkish and USA GDP Growth*

Year/Quarter	USA GDP (%)	Turkish GDP(%)
2007/1	1.2	8.1
2007/2	3.2	3.8
2007/3	3.6	3.2
2007/4	2.1	4.2
2008/1	-0.7	7.2
2008/2	1.5	2.8
2008/3	-2.7	1.0
2008/4	-5.4	-6.5
2009/1	-6.4	-14.7
2009/2	-0.7	-7.9
2009/3	2.2	-3.3

*Notes.* USA data Retrieved March 2, 2010, from [http://www.bea.gov/newsreleases/national/gdp/gdp\\_glance.htm](http://www.bea.gov/newsreleases/national/gdp/gdp_glance.htm); Turkish data Retrieved March 2, 2010, from [http://www.tuik.gov.tr/PreTablo.do?tb\\_id=55&ust\\_id=16](http://www.tuik.gov.tr/PreTablo.do?tb_id=55&ust_id=16).

The breaking point is 2007 in which housing prices started to decrease and interest rates started to increase. Many of the subprime borrowers could not pay their debts and therefore financial institutions entered foreclosure (Yazarkan, 2009, p. 78). But the prices of houses had become less than mortgage loans. The ongoing foreclosure epidemic decreased the wealth of people and the stability of financial institutions. The crisis expanded from

housing market to other parts of the economy, quickly (Vidinlioğlu et al., 2009, p. 1400). Some of the financial institutions were liquidated, some of them were sold, some of them were failed and some of the investment banks became commercial banks after this crisis. A dramatic decrease in GDP, an increase in unemployment rate and several negative economical statistics were observed. Public policy is an important factor that defines which social group will feel the burden of a recession (Eisen, 2009, p. 3).

The effects of 2007 global financial crisis were not limited with US markets. It diffused to other countries and Turkey quickly. Although banking sector of Turkey had not witnessed bankrupt, liquidation or another unwanted process, the GDP of Turkey was decreasing and unemployment rate was increasing like USA and other markets.

Table 1 shows the movement of Turkish and USA GDP after the first quarter of 2007. US economy has been shrinking since the first quarter of 2008 and Turkish economy has been shrinking since the fourth quarter of 2008. Also there is no doubt that 2007 global financial crisis is a contradictory crisis.

### **Income and Consumption**

We mentioned that because of the 2007 global financial crisis economies have been shrinking. So how did this contradiction effect the consumption of households?<sup>2</sup> Is there a relation between consumption and income?

The relationship between income and consumption has been researched for a long time by economists. The critical terms are the income elasticities of demand and Engel relation (Engel curves). Income elasticity of demand is used to describe how the quantity demanded responds to a change in income (Varian, 2006, p. 281; Mansfield, 1985, p. 125). Some demands of goods are positively related to incomes of consumers. In other word, increases in the consumer's income result in increases in the amount of the good consumed. Also another type of goods which are called inferior goods, have negative income elasticities. As consumer's income increases, consumption amount of these goods decreases (Varian, 1992, pp. 117-118; 2006, p. 281; Mansfield, 1985, p. 125).

The first quantitative study on consumption patterns of households was done by Ernst Engel in 1857 (Houthakker, 1957, p. 532; Stigler, 1954, p. 95; Kalyoncu, 2009, p. 21). Engel used cross section data for incomes and expenditures and computed the percentage of incomes spent on each at different income levels. Four items can be summarized the results of Engel's study (Ahcihoca & Ertek, 2000, p. 2):

- (1) Percentage spent on food decreases as income rises;
- (2) Percentage spent on housing stays about the same;
- (3) Percentage spent on clothing stays the same (or increases);
- (4) Percentage spent on luxury increases.

After these findings, Engel draw the curves which show the ratio of percentage change in expenditure on a consumption item to a percentage change in income (Ahcihoca & Ertek, 2000, p. 3; Varian, 2006, pp. 97-101). In economic theory, we call these curves as Engel curves. They are important for studies of household expenditures. Because they show the relationship between the equilibrium quantity purchased of a good and the level of income. In other words, they relates the share of household expenditure on individual goods to total expenditure. The

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<sup>2</sup> Robilliard and others (2001, p. 3) mentioned about household income generation model and then applied this model to Indonesia for searching about Indonesia economy after 1998 crisis.

shape of a consumer's Engel curve depends on the nature of the good, the nature of the consumer's tastes and the level at which commodity prices are held constant (Mansfield, 1985, p. 86). Engel curves would show that the consumption of necessary goods does not change very much in response to changes in income<sup>3</sup>, but the consumption of luxury goods increases considerably with increases in income. The study of the relationship between expenditure and income has been at the center of applied micro-economic welfare analysis since the early studies of Engel (Banks et al., 1997; Leser, 1963, p. 694). Later other consumption studies continued (Vitaliano, 2010, pp. 69-70).

Deaton (1997, p. 263) proposed the functional form of the Engel curve that is consistent with maximizing utility function.

$$S_i = \alpha_i + \beta_i \ln(E/N) + \eta_i \ln(N) \quad (1)$$

$S_i$  : Share of total expenditures spent on expenditures categories;

$N$ : Number of persons in the household;

$E$ : Total expenditure.

If  $\beta$  is positive number then the budget share increases with total spending, we mean the good is a luxury good. Else the good is considered to be a necessity goods and the share decreases when income increases.<sup>4</sup>

We can obtain income elasticities from Engel curves. The income elasticities of food expenditures are inelastic while income elasticities of housing, clothing expenditures are unit elastic. On the other hand, income elasticities of luxury expenditures are elastic (Mankiw, 2009, pp. 97-99). Many scholars studied these relationships in several countries and the results confirmed Engel's law (Houthakker, 1957, pp. 538-540; Açıhoca & Ertek, 2000, p. 3). Ishida and others (2003) classified these studies successfully. The most extensively system applied at the present is AIDS (Almost Ideal Demand System) that was developed by Deaton and Muelbauer (1980). This system is derived as a first order approximation to any demand function which is resulted from an individual's utility maximization. Rahman (2002) showed that the percentage of food expenditure decreases as income increases. Also many studies, which search about consumption-income relationship, were done by scholars in Turkey (Akbat, 2005; Kalyoncu, 2005).

Generally current income is different from long run level of income. Consumption-income relationship was not searched in only micro-manner but also in macro-manner by Keynes, Kuznets, Duesenbery, Friedman, Modigliani and many other authors (Tari & Çalışkan, 2005, p. 2). The results of some studies show that consumption expenditures are well insulated from transitory movements<sup>5</sup> (Blundell & Preston, 1998, p. 604). Therefore permanent income is a more useful indicator than transitory income for thinking about consumption-income relationship.

Table 2 gives shares of expenditure types in Turkish economy. From Table 1, it is seen that GDP of Turkey started to decrease in fourth quarter of 2008 and this shrinkage continued during 2009. According to Engel's study, share of food expenditure should increase, housing and clothing expenditure should stay constant and

<sup>3</sup> Low income consumers are a new market for many food and agricultural goods. So subsidizing low income families will provide an increase in food demand (Gold & Enlow, 1943, p. 597).

<sup>4</sup> We mentioned on first Engel law. But also there is second Engel law that says as the share of food in total expenditures increases with the the number of households in a family (Deaton & Paxson, 1998).

<sup>5</sup> Addition to this, some of the studies showed that current income is found to be important in determining current income (Carroll, 1994, p. 142).

luxury expenditures should decrease. Really, share of food expenditure have been increasing since 2007. Share of clothing and foot wear decreased during 2007-2009. However in this period prices of clothing and foot wear stayed constant while prices of other items increased<sup>6</sup>. Therefore Turkish consumers can buy the same amount of clothing and foot wear by paying less. The items of “housing, water electricity and other rules” and “furnishing, household equipment” are the part of housing expenditure. Share of housing expenditure increased from 27.5 (20.3 + 7.2) to 29.1 (22.2 + 6.9) during the period of 2008-2009. Another attractive solution is that although GDP decreased in 2008/4-2009, the share of “recreation and culture” and “restaurants and hotels” expenditures increased. Restaurants can be evaluated as a part of food expenditure, therefore it is not a surprising result according to Engel’s study. Recreation and culture expenditures have been decreasing since 2005 and perhaps 2008 is deep for this item. Also the share of health expenditures decreased. But all of health expenditures are not mortal. Some medicines such as aspirin, vitamins are just for better health conditions. Probably in this period households decrease the payment of these medicines.

Table 2

*Share of Expenditure Types in Final Consumption Expenditure of Resident and Non-resident Households on Economic Territory in Turkey (at Current Prices)*

Year	Food and beverage and tobacco	Clothing and foot wear	Housing. water electricity and other rules	Furnishing. household equipment	Health	Transport and communication	Recreation and culture	Education	Restaurants and hotels	other
2005	26.6	7.3	16.7	8.2	3.9	18.5	4.9	1.2	6	6.7
2006	25.8	6.6	17.7	8.1	4.1	18.7	4.7	1.3	6.1	7
2007	25.5	6.2	19	7.8	4.1	18.4	4.2	1.3	6	7.5
2008	25.9	5.7	20.3	7.2	4.1	18.5	3.9	1.3	6	7.1
2009	26.1	5.2	22.2	6.9	3.9	17.5	4.1	1.3	6.4	6.5

*Note.* Source: TÜİK (2010), Economic Indicators, 3467, p. 46.

## Method

To reveal the effects of global financial crisis on the economic behavior of university pupils, we applied a survey which consists of 36 questions. We used a similar study of Günsoy and Argan (2009) while preparing questions of survey. The first part of the survey, which has 11 questions, reveals the demographic characteristics of these pupils. The second part of the survey has 25 questions and reveals the effects of global financial crisis. Five point likert scale is used in seven questions of this part and two-point scale (Yes/No) was used in other 18 questions.

There are 909 pupils who were registered in economics programme in Economics and Administrative Sciences Faculty (EASF) of Public University and 1,885 pupils who were registered in Economics and Administrative Programmes (EAP) of Private University Vocational High School. The participants of this study were recruited by random sampling. Surveys were sent to 90 pupils which were registered in Public University EASF and 78 of these surveys were returned completely. Again surveys were sent to 110 pupils in EAP of Private University Vocational School and 100 of them were returned completely. The data were interpreted by 10%

<sup>6</sup> Consumer Price Index of Clothing and Foot Wear in 2008 was 110.96 but it was only 111.67 in 2009 (TÜİK, 2010, p. 195).

sampling error (Baş, 2008, p. 41). The reliability test of this survey was done and very high Cronbach Alpha coefficient (0.70) was found (Nakip, 2006, p. 146; Kalaycı, 2008, p. 41).

### Demographic Findings

As we mentioned before, we investigate the demographic characteristics of pupils in the first part of this study. In Table 3, the findings about the sexes and universities of pupils were given.

Table 3

#### *Sexes of Pupils*

	Sexes		Total
	Female	Male	
Private University	58	42	100
Public University	48	30	78
Total	106	72	178

As a result 59% of the participants were female, and 41% of the participants were male. Also 56% of the participants were from Private University Vocational High School.

Table 4 gives the life style of pupils. As it is seen, most of the pupils (72.5%) were living with their families. So we can say that pupils generally don't prefer to go to university which is far away from their houses. Fourteen percent of pupils were living in dormitories, 10% of them were living with their friends and 3.5% of them were living alone.

Table 4

#### *Life Styles*

	Life				Total
	With family	Dormitory	With friends	Alone	
Pupils	129	25	18	6	178

Table 5 gives the income levels of the pupils. Fourty one percent of the pupils' families were earning 1,001-2,000 TL in a month. Also 55.6% of pupils have families which earn less than 2,001 TL in a month. Only 37% of pupils' family earn more than 3,000 TL. It is interesting that 14.6% of pupils' family have earned less than 1,001 TL.

Table 5

#### *Income Levels of Pupils (Monthly, TL)*

	Income levels (TL)					Total
	0-1,000	1,001-2,000	2,001-3,000	3,001-4,000	4,000+	
Pupils	26	73	46	10	23	178

Table 6 gives percent of pupils who were working. As a result 25.3% of the pupils were working and 74.7% of them were not working.

We have asked the response degree of family income, cultural spendings, consumer spendings, allowance, education spendings, food and health spendings after the global crisis. The results are given in Table 7.

As it is seen that mostly cultural spendings were effected. In micro-economic theory, cultural goods are

luxury goods and their price elasticity are lower than other essential goods. Also food and health goods are necessary goods and they were effected less than other goods. Also one third of pupils' families were affected negatively. Shortly it is seen that crisis hits pupil's families.

Table 6

*Working Pupils (%)*

	Pupils		Total
	Working pupils	Not working pupils	
Pupils	45	133	178

Table 7

*Response Degree*

	Response degree (%)
Family income	34.3
Cultural spendings	34.3
Consumption spendings	32.6
Allowance	27.6
Education spendings	19.7
Food and health spendings	15.2

### Findings About Consumption-Income Relationship

We construct hypotheses which search the relationship between consumption and income. In other words these hypotheses search Engel relation. For that aim we asked questions by using five-point Likert scale. In these questions we asked in what amount their expenditures were effected after global financial crises. We grouped expenditures as consumption (include luxury goods), education, cultural and food-health goods.

$H_0$ : There is no relationship between the response of the participants' families income from the crisis and the response of their consumption expenditures.

$H_1$ : There is a relationship between the response of the participants' families income from the crisis and the response of their consumption expenditures.

We used paired  $t$  test to search about hypothesis (Orhunbilge, 1997, p. 172). As a result  $H_0$  hypothesis is rejected (because of the scores  $t$ : 2.290 and  $p$ : 0.000). As the income of their families decreases, consumption expenditures of participants decreases. Shortly income and consumption corelated positively (the corelation coefficient between families income and consumption expenditures is 0.73). This is a very strong relationship because consumption goods include luxury consumption goods such as parfume, cosmetic etc..

$H_0$ : There is no relationship between the response of the participants' families income from the crisis and the response of their education expenditures.

$H_2$ : There is a relationship between the response of the participants' families income from the crisis and the response of their education expenditures.

Paired  $t$  test is used to search about these hypotheses. As a result  $H_0$  hypothesis is rejected (because of the scores  $t$ : 9.723 and  $p$ : 0.000) in 95% reliability degree. As the income of their families decreases, education expenditures of participants decreases. In other words income and education expenditures corelated positively. This is a similar result with previous search of hypotheses but this time correlation is weaker (the corelation

coefficient between families income and education expenditures is 0.50).

$H_0$ : There is no relationship between the response of the participants' families income from the crisis and the response of their cultural expenditures.

$H_3$ : There is a relationship between the response of the participants' families income from the crisis and the response of their cultural expenditures

We used paired  $t$  test to search about hypothesis. As a result  $H_0$  hypothesis is rejected (because of the scores  $t$ : 2.575 and  $p$ : 0.011). As the income of their families decreases, cultural expenditures of participants decrease again. So income and cultural expenditures are related positively with each other (the correlation coefficient between families income and cultural expenditures is 0.54).

$H_0$ : There is no relationship between the response of the participants' families income from the crisis and the response of their food and health expenditures.

$H_4$ : There is a relationship between the response of the participants' families income from the crisis and the response of their food and health expenditures

We used paired  $t$  test to search about hypothesis. As a result  $H_0$  hypothesis is rejected (because of the scores  $t$ : 10.206 and  $p$ : 0.011). As the income of their families decreases, food and health expenditures of participants decreases. Shortly income and food-health expenditures correlated positively (the correlation coefficient between families income and consumption expenditures is 0.45). But this time correlation is very weak, because food and health goods are necessary goods. The income elasticity of necessary goods is lower than other goods. Because households are ready to spend on these types of goods without thinking their income levels.

These results are well matched with micro-economic theory. The expenditures of participants increased when income of their family increased and vice versa. In theory, income elasticity of food-health goods is lower and of luxury consumption goods is higher. Really, it is seen that health-food expenditures were affected less from income movements. Oppositely expenditures for luxury consumption goods were affected highly.

Another subject we search about is which part of the society decrease its expenditures after hitting of global crisis. For that reason, we divided participants according to their families' income levels.

$H_0$ : There is no difference between the response degree of expenditures of participants whose families earn more than 2,001 TL in a month and less than 2,000 TL in a month.

$H_5$ : There is difference between the response degree of expenditures of participants whose families earn more than 2,001 TL in a month and less than 2,000 TL in a month.

We used  $t$  test to search about these hypotheses (Kalaycı, 2008, p. 74; Nakip, 2006, p. 274). At the end of this analysis  $H_0$  is rejected with the reliance level of 0,95 (because of the scores  $t$ : 2.346 and  $p$ : 0.020). So the expenditures of participants, whose families earn less than 2,000 TL, decreased higher than the expenditures of participants whose families earn more than 2,001 TL after hitting of global crisis.

$H_0$ : There is no difference between the response degree of expenditures of participants whose families earn more than 4,001 TL in a month and less than 1,000 TL in a month.

$H_6$ : There is difference between the response degree of expenditures of participants whose families earn more than 4,001 TL in a month and less than 1,000 TL in a month.

We used  $t$  test to search about these hypotheses. At the end of this analysis  $H_0$  is rejected with the reliance level of 0.95 (because of the scores  $t$ : 2.251 and  $p$ : 0.032). In other words, the expenditure of poors decreased



more than the decrease of rich ones. These results also can be a signal of the deterioration on income distribution.

### Conclusion

The aim of this study is to search about the effect of 2007 global financial crisis on pupil's economy and examine the decrease in consumption. First, we obtained that more than one third of pupils' families were hit by 2007 global crisis. Their income decreased after this crisis. Second, we examine the relationship between the decrease in income and consumption items. By doing this, we searched about the part of micro-economic theory which concerns about income elasticity and Engel Functions. As a result, we found that expenditure of pupils' family and income are positively related. Last, the expenditure for consumption goods which include luxury goods were mostly effected from this crisis. Although the expenditures for food and health were decreased, the reduction degree is smaller than the reduction of other items (consumption, cultural, education spendings). The result of this solution is based on income elasticity differences between these consumption items. The results are matched with the theory of Engel functions.

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