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Armagan Tuna Aktuna-Gunes, Okay Gunes. Measuring the Relative Domestic Production Scarcity of Time Spent in Domestic Activities for Turkey. 2017. halshs-01491982

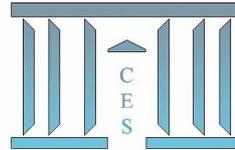
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Submitted on 17 Mar 2017

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**Measuring the Relative Domestic Production Scarcity  
of Time Spent in Domestic Activities for Turkey**

Armagan Tuna AKTUNA-GUNES, Okay GUNES

2017.18



# Measuring the Relative Domestic Production Scarcity of Time Spent in Domestic Activities for Turkey

Armagan Tuna Aktuna-Gunes\*

Okay Gunes\*\*

## Abstract

In this paper we specify and estimate the “domestic production scarcity of time use” as the time use demand elasticity of commodity use in domestic activity. We integrate domestic production technology as the good intensity of time use into scarcity in time use and monetary expenditure which enables us to better differentiate for which consumption groups households have a more complementary than substitutable nature with regards to domestic production. We match the Time Use Survey for 2006 with the Household Budget Survey for the years between 2007 and 2013(inclusive) by using a new matching method proposed by Rubin (1986).

Keywords: Household production technology, Matching statistics, Time use elasticity of substitution

JEL: J22, D12, D13

## 1. Introduction

The time counterparts to consumption activities in consumer choice became somewhat easier to ascertain in the way of the revolutionary works of Mincer (1963) and Becker (1965). However, their works opened up new problematic areas regarding the question of time within the traditional theory. Their efforts, which envisaged clarifying the blurred perception of time in economics, led the theories of time allocation, according to which, the role of time use at the level of individual decisions can be explored in many different ways.

Despite of these efforts, many issues regarding domestic production technology and the nature of combination of time with commodities still remain largely unsolved. Exploring the nature of the production process has been limited due to a lack of surveys able to report on household allocation of money and time together<sup>1</sup>. The absence of a single dataset recording household purchases of goods and services and the major information about how time use values for members of the same household create the problem of knowing the relative importance of goods and time in different household activities. Recent discussion in the literature shows that each commodity group would have non-identical time use combinations. Gronau and Hamermesh (2006) measure the combination of time and commodity in household production as the relative goods intensities of time spent in domestic production. They demonstrate that certain commodities such as health and travel are relatively goods-intensive to produce, while leisure activities are relatively time-intensive. But this raises a problem wherein the household production function indicates the relative difficulty of goods-time substitution in producing this commodity. Hamermesh (2008) examines the relationship

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<sup>1</sup> The applicability of Becker's home production specification is particularly criticized by Pollak and Watcher (1975)

between inputs to eating such as time spent in food purchasing, preparation, consumption and clean-up; and goods-purchased foods. He found that the elasticity of substitution between time and goods is quite low (i.e. lower than one) and that the substitution of goods for time is not simple in the case of eating activity. In other words, increasing the value of time (due to an increase in shadow prices) tends to increase the monetary expenditures relative to time spent on the domestic production of meals. The basic intuition underpinning this idea is that the necessary inputs for the production of meals are complementary rather than substitutionary. Chin (2008) found evidence that time intensive commodities are substituted for goods-intensive commodities for eating when wages increase. Further, Baral et al. (2011) suggest that the “food production” goods-time elasticity of substitution will be greater than the “eating” elasticity of substitution: they found that the “food production” goods-time elasticity of substitution is about 60% greater than the “eating” goods-time elasticity of substitution. The motivation for this differentiation is that there may be cases where the difference between a “pure production” and a “production plus consumption” elasticity of substitution between goods and time could be important. Later, Davis and You (2013) confirm that it is difficult to substitute money for time in home meal production. Canelas et al. (2014) generalized the method proposed by Hamermesh (2008) to estimate the elasticity of substitution for all types of commodities. They pointed out that substitutability exists between inputs of necessity goods, a higher elasticity of substitution for higher-educated households, and a higher elasticity is imposed on the opportunity cost of time rather than on the market wage.

In recent years, estimations using micro data on consumption and time use activities in order to better identify household member’s time and consumption allocation decisions have shown that domestic production technology may play an important role in consumption and labour force participation decision. Aktuna-Gunes et al. (2014) estimate a complete demand system equation including all commodity groups for different workers categories (such as wage workers and the self-employed). They conclude that including monetary time use values into monetary expenditures causes a significant, increase, approximately 22 percent points, in the estimated size of the informal economy in Turkey during the years from 2003 to 2006. Participation in the informal sector is closely related with labour market structure and the capacity for combining time with commodities for different household workers. Therefore, Aktuna-Gunes et al. (2016) later showed that including monetary time use and informal earnings into expenditure data allows for a better estimation of the demand elasticities. The idea is that different relative goods intensities and limits, in a combination of commodities with time, would cause an important change in income and price elasticities from those estimates where only monetary income elasticities are used. Their method is based on a Beckerian-type full price approach proposed by Gardes (2014, 2016)<sup>2</sup>. Gardes’ method allows us to better investigate the effect of relative good intensities on the demand elasticities of different subpopulations (young vs old, rich vs poor...), which is crucial for the micro-simulation of public policy, for measuring changes in welfare associated with price variations

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<sup>2</sup> In that model, the full price is defined as the sum of the monetary price and the cost of time to produce one unit for the final good.

and for testing theoretical assumptions (such as the integrability of demand functions) (see e.g., Alpman and Gardes, 2016; Canelas et. al, 2013; Gardes and Starzec, 2009)

However, none of these works directly reports the degree of the capacity for combining households' commodity consumption and time use. A production technology measurement proposed by Gronau and Hamermesh (2006) indicates the commodity intensity in per time spent activity. This relationship indeed depends on two presuppositions: it is supposed that the main factor determining the relationship between consumption and time use is the existence of a shadow price for the time use activity. Indeed, the shadow price exists if and only if the individual knows the technology of combining consumption with corresponding time. Households substitute the time intensive goods with goods intensive ones since an increase in the shadow price of time immediately raises the relative price of time-intensive commodities. Therefore, the shadow price of time is modulated by time scarcity in each household time budget: if the labour supply is supposed to be endogenously determined under market conditions, then time scarcity (i.e. for the domestic production) depends totally on the relationship between income and non-labour time. The higher the labour supply and the lower the non-labour time, hence the greater the time scarcity and the shadow price of time (Gronau, 1986).

Therefore, in this paper we propose to measure the time use demand elasticity of commodities used in domestic production for each consumption group. We suppose that households may have less discretionary time uses in domestic production for certain activities. Thus, the time use demand elasticities of commodities used in domestic production can be interpreted as a sort of "Relative Domestic Production Scarcity". Relative Domestic Production Scarcities (RDPs) are determined through the Marginal Propensity of Time Uses (MPTu) for each expenditure group to be corrected by relative good intensity of time use in domestic production. Analyses of the results provide information on the nature of complementarity or substitutability in the combination of time use and commodity in the domestic production population for different subpopulations. To this end, we surmount the dataset problem by using statistical matching for the household budget survey with time use data based on Rubin's (1986) matching specification. We use the "concatenation" method as according to Rubin (1986, 1987) partial correlation between variable Y in survey A and variable Z in survey B can be used which enables us to display the uncertainty due to the use of fabricated data. We match Turkish Time Use Survey in 2006 with Household Budget Surveys between 2007 and 2013 inclusive.

The rest of the paper proceeds as follows: Section 2 represents household production technologies as the time use demand elasticity of commodity use. Descriptions of the household budget survey and time use survey data with statistical matching based on Rubin's' specification are given in Section 3. Section 4 represents and discusses the results for different subpopulations. Section 5 concludes the paper.

## **2. Relative Domestic Production Scarcity**

Following the methodology proposed by Gardes (2016), let  $\tau_{ih}$  be the time use necessary to produce one unit of that activity. Suppose that a Leontief technology allows the quantities of the two factors to be proportional to the activity  $i$  of households  $h$ :

$$\begin{aligned} x_{ih} &= \xi_{ih} z_{ih} \\ t_{ih} &= \theta_{ih} z_{ih} \end{aligned} \quad \text{so that } t_{ih} = \tau_{ih} x_{ih}, \text{ yields } \tau_{ih} = \frac{\theta_{ih}}{\xi_{ih}}$$

This case corresponds to an assumption of complementarity between the two factors in the domestic technology<sup>3</sup>.

Now, supposing that  $t_{i,n}$  is the domestic time demand at time  $n$  and  $t_{i,n-1}$  is the available time as used in domestic production during the previous period  $n-1$  for activity  $i$ , time scarcity can be simply denoted as the percentage change  $t$  between two periods:  $s_{i,t} = (t_{i,n} - t_{i,n-1}) / t_{i,n-1}$ . If we suppose that a household requires the same amount of time spent at  $t_{i,n}$  and  $t_{i,n-1}$  for activity  $i$ , hence  $s_{i,t} = 0$  if  $t_{i,n-1} = t_{i,n}$ , otherwise  $s_{i,t} > 0$  if  $t_{i,n-1} < t_{i,n}$  and  $s_{i,t} < 0$  if  $t_{i,n-1} > t_{i,n}$ . Similarly  $s_{i,x} = (x_{i,n} - x_{i,n-1}) / x_{i,n-1}$  gives the commodity scarcity in domestic activity, with  $s_{i,x} = 0$  if  $x_{i,n-1} = x_{i,n}$ , otherwise  $s_{i,x} > 0$  if  $x_{i,n-1} < x_{i,n}$  and  $s_{i,x} < 0$  if  $x_{i,n-1} > x_{i,n}$ <sup>4</sup>. It is clear that  $s_{i,t}$  and  $s_{i,x}$  depend on the supposition that the tastes, technology  $\tau_{ih}$  used in domestic production and other external economic factors supposed to remain constant between the two periods.

We measure Relative Domestic Production Scarcity (*RDPs*) by the ratio of these two scarcities  $s_{i,t} / s_{i,x}$  which represents the time use demand elasticity of commodity use in domestic production for activity  $i$ .

$$RDPs_{t_i/x_i} = \frac{s_{t_i}}{s_{x_i}} = \frac{(t_{i,n} - t_{i,n-1})}{(x_{i,n} - x_{i,n-1})} \frac{x_{i,n-1}}{t_{i,n-1}} = \frac{\Delta t_i}{\Delta x_i} \frac{\xi_{ih}}{\theta_{ih}} = MPTu_{\partial x_i \rightarrow \partial t_i} (\tau_{ih})^{-1} \quad (1)$$

*RDPs* in equation (1) equals to Marginal Propensity of Time Use (*MPTu*) with respect to commodity use in domestic production multiplied by  $(\tau_{ih})^{-1}$  as the inverse of production technology for consumption activity  $i$  of household  $h$ . The inverse production technology corresponds to the technology used by Gronau and Hamermesh (2006) as the commodity intensity of time use for activity  $i$ . *RDPs* in equation (1) can further be interpreted as the time use demand elasticity of commodity use as follows:

$$RDPs_{t_i/x_i} = \varepsilon_{t_i/x_i} = \frac{\partial \ln t_i}{\partial \ln x_i} \quad (2)$$

Regarding the theory, the substitution between time use and commodity would result in negative values of elasticity ( $\varepsilon_{t_i/x_i} < 0$ ) while positive ( $\varepsilon_{t_i/x_i} > 0$ ) if complementary between time and commodity use exists<sup>5</sup>.

### 3. Micro Data, Matching Statistics and Domestic Scarcity Analysis

We use two household surveys: the Time use survey (TUS) in 2006 and the Household budget surveys (HBS) for the years between 2007 and 2013 from the Turkish Statistical Institute (TURKSTAT). The HBS have been conducted on a total of monthly 720 and annually 8640

<sup>3</sup> An alternative hypothesis based on the substitutability between the two factors is discussed in Alpman and Gardes, 2016.

<sup>4</sup>  $s_x$  can also be interpreted as the scarcity of commodity from year to another when needs change with respect to previous year. The simple reason is that an increase in income yields new needs (i.e. income elasticity of minimum income to satisfy basic needs takes the value between zero and one, see Gardes and Merigan, 2005).

<sup>5</sup> *RDPs* measures the goods-time elasticity of substitution (i.e. the elasticity of time use substitution between commodity use in domestic production). For the derivation of elasticity see ‘‘Elasticity of time use substitution’’ in the Appendix.

households for each year. Three basic groups of variables have been obtained from these surveys: Variables of the socio-economic status of the households such as the status of property of house, living in village or in rural areas, etc; variables related to individuals (age, gender, academic background). Consumption expenditures variables (food and non alcoholic beverages, alcoholic beverages with cigarette and tobacco, clothing, health, transportation, education services, etc.) In the TUS in 2006, approximately 390 households were selected each month giving a total of 5070 households during the whole year. Within these households 11 815 members aged 15 years and over were interviewed and were asked to complete two diaries – one for a weekday and one for a weekend day – by recording all of their daily activities during 24 hours at ten-minute-slots. This survey on Time use in 2006 is matched independently on the Family budget survey realizing monetary and time expenditure data. In this application we do not take into account the possible spatial autocorrelation within regions.

We combine the monetary and time expenditures into a unique consumption activity at the individual level. We proceed with the matching of these surveys by using similar exogenous characteristics in both datasets as age, size of household using OECD equivalence scales, proportion of children in the households, matrimonial situation, home ownership, number of household members, geographical location separately for head of household and wife. The selection equation concerns the households which have a positive time use of their activities. More precisely, we estimate 8 types of time use in the TUS which are also compatible with the available data from HBS as follows:

1. Food Time (TUS) - Food Expenditures (HBS)
2. Personal Care and Health Time (TUS) - Personal Care and Health Expenditures (HBS)
3. Housing Time (TUS) - Dwelling Expenditures (HBS)
4. Clothing Time (TUS) – Clothing Expenditures (HBS)
5. Education Time (TUS) - Education Expenditures (HBS)
6. Transport Time (TUS) - Transport Expenditures (HBS)
7. Leisure Time (TUS) - Leisure Expenditures (HBS)
8. Other Time (TUS) - Other Expenditures (HBS)

Food Time includes household and family care as the administration of food. Personal Care Time consists of personal care, commercial-managerial-personal services, helping sick or old household person. Housing Time corresponds to household-family care as home care, gardening and pet animal care, replacement of house-constructional work, repairing and administration of the household. Clothing Time consists of washing clothes and ironing. Education Time includes study (education) and childcare. Transport Time consists of travel and unspecified time use. Leisure Time corresponds to voluntary work and meetings, social life and entertainment as social life, entertainment-culture, and resting-holiday, sport activity as physical practice, hunting, fishing etc., sport, hobbies and games as art and hobbies, mass media as reading, TV/Video, radio and music. Other Time includes employment and labor searching times.

### 3.1. Matching Procedure

Rubin's (1986) matching approach is considered to be distinct from almost all other work on this topic (Moriarity and Scheuren, 2003). In fact, when variables  $Y$  and  $Z$  are not jointly observed for any unit in survey  $A$  and in survey  $B$ , the missing values of  $Y$  are imputed most often according to  $Y$ 's relationship with common variable  $X$ , and the missing values of  $Z$  are imputed according to the relationship  $Z$  has with common variables  $X$ . Obviously, when the partial correlation value between  $Y$  and  $Z$  for given common variables  $X$  is implicitly and wrongly assumed to be zero imputed values are likely to be inaccurate. As shown by Alpman (2016), in the most simple case, the same  $Y$  values, for example, would be imputed to units with different  $Z$  and identical  $X$  when in fact the imputed  $Y$  values should differ with  $Z$  for a given  $X$ , if the partial correlation between  $Y$  and  $Z$  given  $X$  is other than zero.

In this paper, we take into account the concatenation between imputed variables in the time dataset<sup>6</sup>. To summarise the concatenation methodology proposed by Rubin (1986, 1987), the variable  $Y$  in survey  $A$  is imputed in survey  $B$  and the variable  $Z$  in survey  $B$  is imputed in survey  $A$ . The software used for this matching was developed by Alpman (2016). The details of the matching procedure are as follows:

- i. We consider three different kinds of variable sets: the first group of variables ( $Y$ ) include the above-explained time use categories in the TUS. The second group ( $Z$ ) represents the expenditure variables in the HBS corresponding to ( $Y$ ) in the TUS. The third set is the common variables ( $X$ ) such as sex, age, marital status, education level, geographic location, employment status, sector of work and type of firm in both surveys. The main hypothesis is that the partial correlation between  $Y$  and  $Z$  given  $X$  is supposed to be other than zero and is denoted thusly:  $\rho_{Y,Z|X} \neq 0$ .
- ii. Thus, the partial variance of  $Y$  and  $Z$  given  $X$ , respectively  $\rho_{Y|X}$  and  $\rho_{Z|X}$ , can be obtained by linear regressions of  $Y$  and  $Z$  on  $X$ . We begin with a linear regression model where  $Y$  and  $Z$  are successively regressed on  $X$ :

$$Y = a_0 + aX + \epsilon \quad (3)$$

$$Z = b_0 + bX + \mu \quad (4)$$

- iii. The partial covariance of ( $Y$ ,  $Z$ ) given  $X$ , denoted  $\sigma_{Y,Z|X}$ , can be deduced from  $\rho_{Y,Z|X} (\rho_{Y|X} * \rho_{Z|X})^{1/2}$ .
- iv. Supposing that  $\alpha$  and  $\beta$  are the column vectors of the regression coefficients of  $Y$  on  $(1,X)$  and  $Z$  on  $(1,X)$  respectively,  $Y$  and  $Z$  values may be generated for the dataset formed by  $A$  and  $B$  by using these regression coefficients. In this prediction, it is assumed that  $Y$  and  $Z$  values are conditionally independent for a given  $X$ . Rubin (1986) applies the sweep matrix operator: sweeping on  $Y$  gives the regression coefficients of  $Z$  on  $(1,X,Y)$  while sweeping on  $Z$  gives the regression coefficients of  $Y$  on  $(1,X,Z)$ . The new regression coefficients are used to create new predicted  $Y$  and  $Z$  values for the dataset formed by  $A$  and  $B$ .

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<sup>6</sup> We would like to thank A. Alpman for his help in the application of this matching procedure. See a discussion of matching procedure Alpman and Gardes (2016).

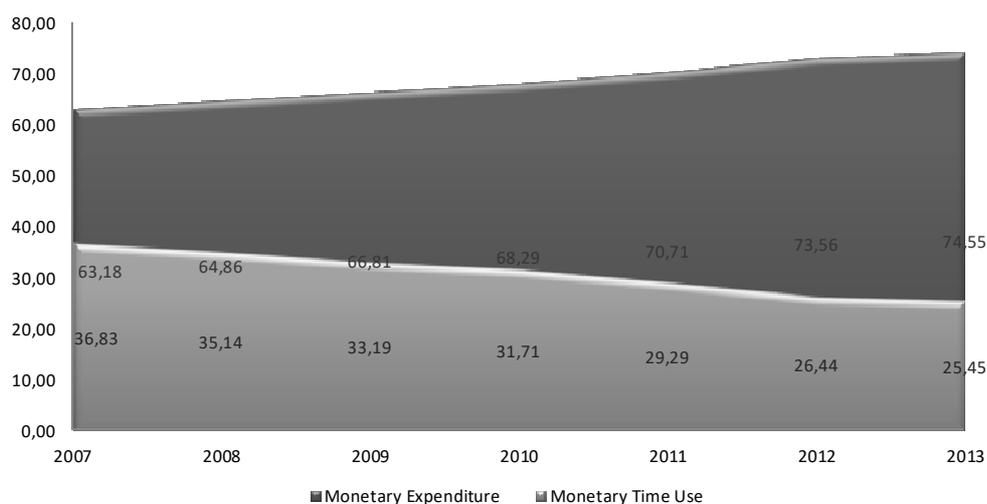
- v. Thus, the predicted  $Y$  and  $Z$  are used in the prediction equation for  $Y$  given  $X$  and  $Z$  and in the prediction equation for  $Z$  given  $X$  and  $Y$ . These are the new prediction coefficients used to create new  $Y$  and  $Z$  values for the dataset formed by  $A$  and  $B$ : each missing unit of  $Z$  in  $A$  (and  $Y$  in  $B$ ) is matched with the closest new predicted  $Z$  value in  $B$  (and  $Y$  in  $A$ ), dependent on identical characteristics informed by  $X$ .

According to Rubin (1986), a multiple imputation is required to avoid erroneous conclusions. That is to say, Rubin (1986) suggests repeating the steps from  $ii$  to  $v$  simply due to the fact that uncertainty exists regarding the arbitrary choice of  $\rho_{Y,Z|X \neq 0}$ .

### 3.2. Descriptive Analysis and Estimation Results

We reference the 2006 TUS and HBS for the years 2007 and 2013 inclusive, conducted by TURKSTAT<sup>7</sup>. In our analysis, we use the market wage rates for each year to derive monetary time use values. We compute the full expenditure budget shares in Graph 1 to give a picture of the changes in the shares of monetary time use and monetary expenditure between 2007 and 2013. Time budget shares decreased gradually between 36.8% in 2007 to 25.4% in 2013; while monetary expenditure budget shares increased from 63.1% in 2007 to 74.5% in 2013.

Graph 1: Full Budget Shares (from 2007 to 2013)



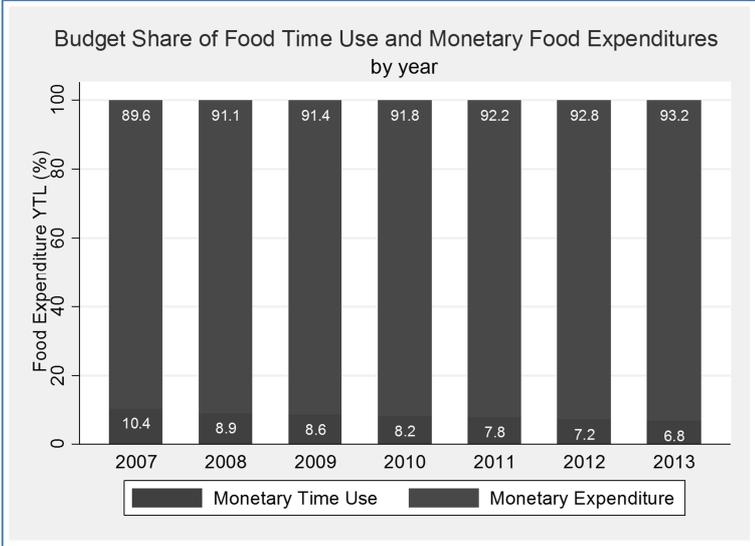
Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

However, these findings can be misleading because of the fact that the combination of time use and commodity are indeed different for each consumption group. In order to clarify this, we decided to look separately at the full expenditure budget shares for each consumption group. As can be observed from the average food time use and monetary food expenditure in Graph 2, the share of time use of food continuously decreases from 10.4% in 2007 to 6.8% in 2013 where the part of food time use values in 2013 is 52.9% lower than in 2007. The

<sup>7</sup> The summary statistics are given in the appendix.

most significant of these changes is between the years 2007 and 2008 where there is 1.5 point of difference. The average time use share over seven years is 8.27%<sup>8</sup>.

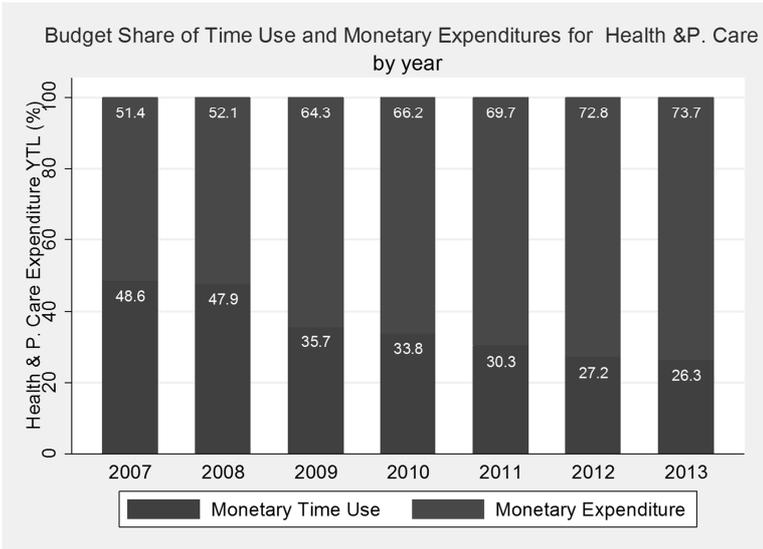
Graph 2:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

Again, in the health and personal care category, the time budget shares of health and personal care decreased at a constant rate across between the years of observation. According to Graph 3, the most intensive decrease for time use budget shares happened between 2008 and 2009 where it fell from 47.9% to 35.7%. In contrast, the commodity share rose to 73.7% in 2013, while it was 51.4% in 2007.

Graph 3:

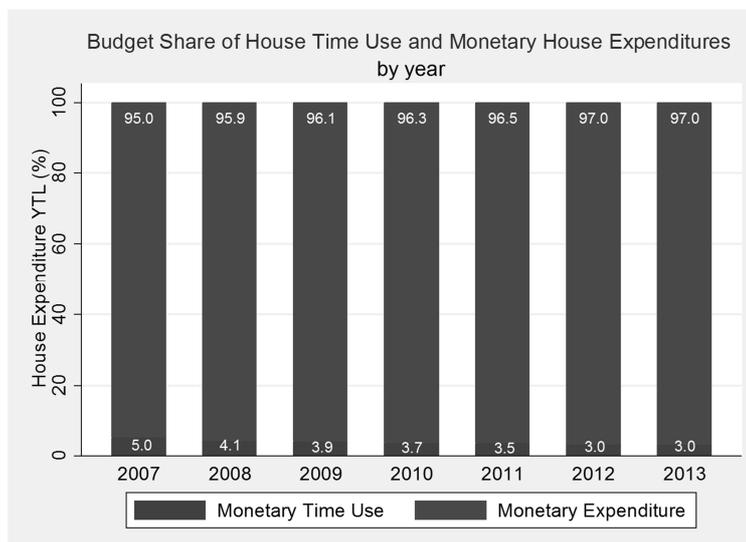


Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

<sup>8</sup> In general, the share of time use shares are expected to be higher than 8.27%. This is simply due to the fact that the time use in food category in TUS 2006 only includes the time spent for food preparation (washing food, cooking, preparing coffee, tea etc., setting table etc.), dish washing, removing waste from the refrigerator, clearing the table etc., doing/drain/ freeze canned, pickle, cheese, bologna, saltwater etc. but not include shopping and eating time.

The housing category has the highest monetary expenditure budget share group among other groups for the years of observation, can be seen in Graph 4. Its budget share reaches up to 97% compared to 3% for time budget shares in 2013. Time use in housing is scarce apparently more important than food for Turkey.

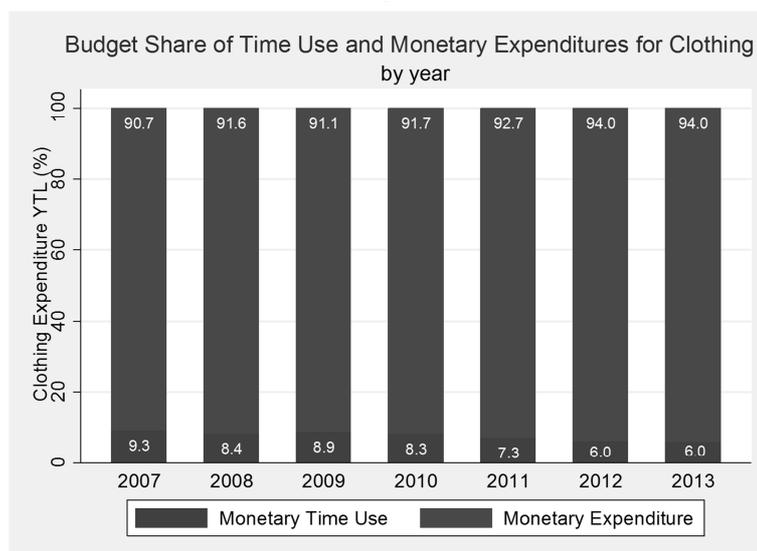
Graph 4:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

When we look at Graph 5, we can calculate that the clothing time use budget shares represents 7.74% of full expenditure in the average. The highest time use budget share was 9.3% in 2007 and the lowest years were 2012 and 2013 with 6%. There is also a decreasing trend between 2007 and 2013, with the exception of 2009 with the share at 8.9%.

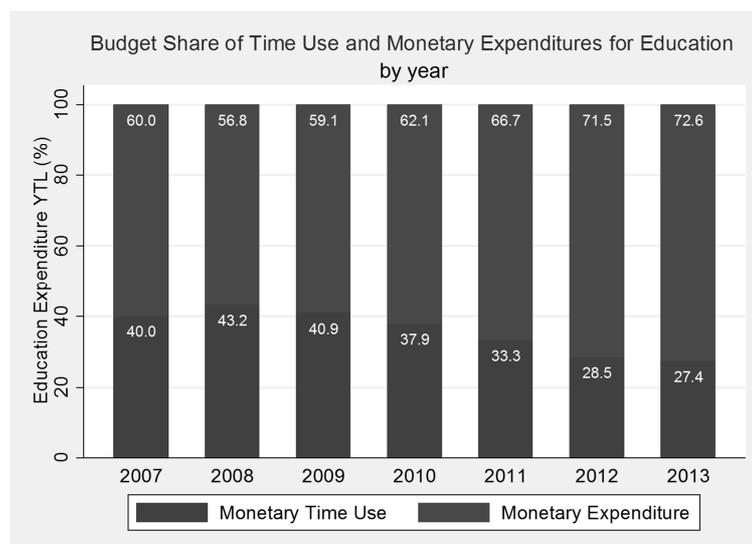
Graph 5:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

Education monetary expenditure takes three fifths of full expenditure in 2007. Graph 6 points out that this rate tends to increase due to lower time use budget shares for the years 2010, 2011, 2012 and 2013. The time use share only increased in 2008 and 2009 with rates of 43.2% and 40.9%, respectively.

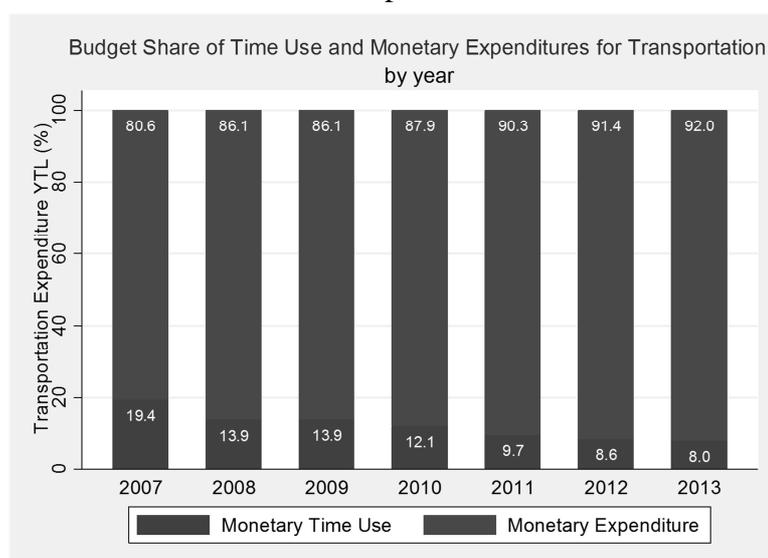
Graph 6:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

Graph 7 indicates a decreasing tendency for transport time use shares between these years. For the years 2008 and 2009, the time use and commodity shares remain constant. The highest time use share was in 2007 with a value of 19.4% and its lowest rate was 8% in 2013.

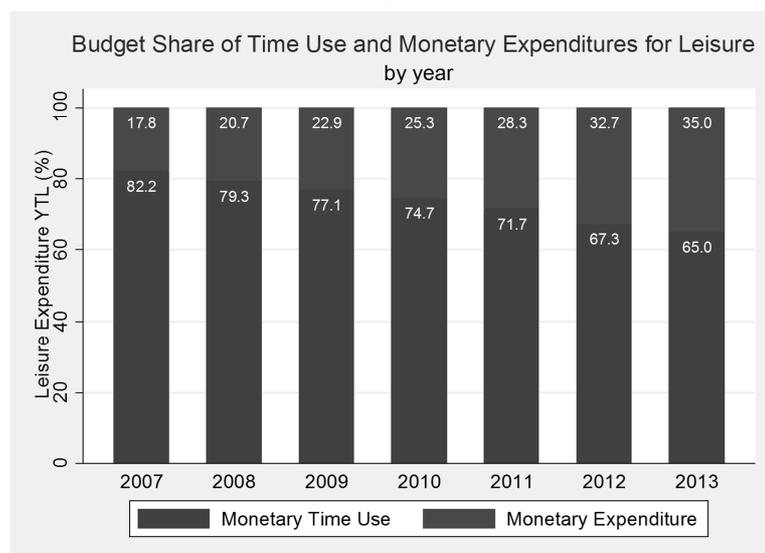
Graph 7:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

The greater part of leisure expenditures consists of time spent (see Graph 8). However, there is a marked decreasing trend of around 3% for each year. Thus, 82.2% was the highest share in 2007 and 65% in 2013 was the lowest share of time use share in full expenditure.

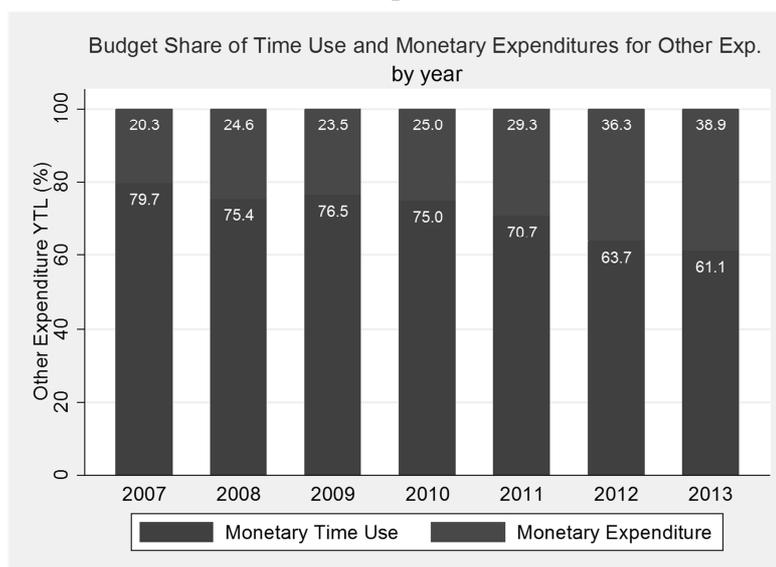
Graph 8:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

For the other expenditure groups in Graph 9 very high time use budget shares are apparent between 2007 and 2013. This rate remains quite steady until 2010 however, it decreases significantly from 2011 and took 61.1% in 2013.

Graph 9:



Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

We believe that the methodology proposed by Gronau and Hamermesh (2006) for the relative commodity intensity of time use as the ratio between commodity and time spent in domestic production for the subpopulation and for all years, allows us to better capture time use scarcity in domestic production. The Table 1 gives a summary of the production technology for Turkey.

Table 1: Evolution of Commodity per Time Spent between the Years 2007 and 2013

Relatif Comodity Intensity of Time (Monetary Expenditures/Monetary Time Use Expenditures)	Health & Personal							
	Food	Care	Housing	Clothing	Education	Transport	Leisure	Other
<b>Age (2007-2013)</b>								
15-24	9,83	0,79	13,42	3,63	0,50	3,56	0,25	0,20
<i>Std. Dev.</i>	20,11	8,65	26,09	7,96	4,60	18,33	3,69	0,90
25-34	7,90	0,68	15,76	3,39	0,39	4,05	0,23	0,08
<i>Std. Dev.</i>	16,46	4,15	29,59	8,53	2,44	22,74	3,22	0,57
35-44	7,77	0,56	15,41	2,58	1,16	3,99	0,21	0,08
<i>Std. Dev.</i>	16,65	1,70	29,10	6,64	9,89	20,76	1,90	0,41
45-54	10,34	0,65	13,15	2,67	0,92	4,26	0,22	0,09
<i>Std. Dev.</i>	22,05	3,69	24,43	8,53	5,46	20,98	8,84	0,36
55-64	8,97	0,59	11,58	2,67	0,43	3,94	0,10	0,09
<i>Std. Dev.</i>	18,62	4,88	22,19	7,02	2,29	29,76	1,19	0,73
65+	7,54	0,63	11,69	2,20	0,93	4,47	0,17	0,10
<i>Std. Dev.</i>	16,23	2,45	25,13	5,04	2,77	20,03	0,91	0,49
<b>Geographique(2007-2013)</b>								
Rural	8,41	0,57	8,70	2,33	0,33	2,63	0,12	0,08
<i>Std. Dev.</i>	18,70	7,72	20,07	6,91	3,39	19,47	2,84	0,48
Urban	9,20	0,70	15,99	3,26	0,73	4,30	0,25	0,12
<i>Std. Dev.</i>	19,08	4,63	29,61	8,33	6,93	27,24	5,58	0,70
<b>Household Type(2007-2013)</b>								
Married without children	7,14	0,49	11,63	1,85	0,17	3,25	0,11	0,07
<i>Std. Dev.</i>	14,86	4,51	27,14	5,91	2,76	29,94	0,75	0,69
Married with children	9,43	0,64	14,85	3,31	0,78	4,00	0,23	0,12
<i>Std. Dev.</i>	19,29	4,13	27,83	8,45	7,36	26,10	5,94	0,57
Single persons without children	2,57	0,42	8,24	1,58	0,41	1,89	0,12	0,04
<i>Std. Dev.</i>	6,63	1,77	20,47	5,20	2,46	16,18	0,99	0,15
Single persons with children	6,98	0,47	13,02	3,05	0,34	1,80	0,13	0,15
<i>Std. Dev.</i>	14,52	1,31	24,60	7,05	2,94	14,80	0,82	0,85
Other family types	9,84	0,83	12,51	3,01	0,42	3,86	0,21	0,10
<i>Std. Dev.</i>	21,16	9,07	26,12	8,02	3,62	21,56	3,63	0,73
<b>Education (Male)(2007-2013)</b>								
Pre-Primary Education	6,33	0,69	11,21	2,87	0,69	4,50	0,21	0,13
<i>Std. Dev.</i>	15,47	5,32	23,58	7,63	6,14	22,05	2,67	0,67
Primary Education	10,01	0,31	6,60	0,84	0,23	1,07	0,04	0,03
<i>Std. Dev.</i>	20,10	2,45	16,40	2,58	1,25	8,24	0,39	0,15
Secondary Education	17,11	0,49	18,19	4,13	0,58	2,11	0,09	0,05
<i>Std. Dev.</i>	24,61	3,45	28,15	6,63	2,87	16,78	1,03	0,26
Tertiary Education	23,75	0,63	30,51	2,97	0,71	3,75	0,40	0,07
<i>Std. Dev.</i>	27,86	2,34	36,27	4,68	3,03	32,20	16,01	0,51
Higher Education	15,98	0,97	46,92	6,08	1,58	5,58	0,39	0,14
<i>Std. Dev.</i>	17,70	1,96	53,79	11,96	6,03	19,83	1,42	0,92
<b>Education (Female)(2007-2013)</b>								
Pre-Primary Education	11,33	0,67	16,41	3,34	0,71	3,74	0,21	0,11
<i>Std. Dev.</i>	20,93	4,94	29,04	7,24	3,85	17,05	4,48	0,61
Primary Education	1,78	0,52	3,30	1,54	0,29	2,90	0,08	0,04
<i>Std. Dev.</i>	3,90	6,41	6,89	5,85	2,52	17,31	0,97	0,27
Secondary Education	1,71	0,54	4,87	1,92	0,49	4,39	0,13	0,07
<i>Std. Dev.</i>	3,28	3,29	10,65	5,99	3,17	24,89	1,88	0,49
Tertiary Education	1,88	0,78	8,07	3,77	1,47	8,51	0,28	0,12
<i>Std. Dev.</i>	3,63	5,62	18,23	11,40	21,60	67,29	3,35	0,54
Higher Education	2,71	1,25	18,13	6,70	2,00	13,59	0,74	0,19
<i>Std. Dev.</i>	6,87	1,91	40,08	14,76	10,74	40,89	2,22	0,84
<b>(2007-2013)</b>								
Total	8,66	0,66	13,67	2,94	0,70	4,05	0,20	0,11
<i>Std. Dev.</i>	18,37	4,85	26,64	7,48	5,64	21,60	4,08	0,60
<b>Years</b>								
2 007	9,78	0,59	14,13	3,29	0,89	3,14	0,19	0,10
<i>Std. Dev.</i>	20,44	4,79	28,51	8,15	11,46	18,61	3,45	0,73
2 008	9,64	0,45	14,42	3,19	0,57	4,03	0,17	0,12
<i>Std. Dev.</i>	19,98	2,27	27,40	7,97	2,82	20,64	1,54	0,62
2 009	8,87	0,64	13,22	2,61	0,60	3,35	0,20	0,10
<i>Std. Dev.</i>	18,70	4,14	26,62	6,49	3,34	15,39	4,01	0,54
2 010	8,34	0,61	13,05	2,64	0,61	3,66	0,17	0,09
<i>Std. Dev.</i>	17,21	2,30	25,30	6,53	3,50	18,03	1,43	0,42
2 011	8,25	0,74	12,95	2,78	0,65	4,48	0,19	0,11
<i>Std. Dev.</i>	17,08	4,93	25,08	6,75	3,86	26,50	1,64	0,70
2 012	7,99	0,82	14,34	3,15	0,77	4,70	0,23	0,12
<i>Std. Dev.</i>	17,96	8,62	27,32	8,69	4,68	20,40	3,53	0,57
2 013	7,86	0,72	13,53	2,90	0,79	4,84	0,26	0,12
<i>Std. Dev.</i>	16,90	3,40	25,98	7,33	4,73	27,90	8,04	0,60

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

In this table, production technology is calculated as the relative goods intensity of time use for each consumption group for different subpopulations<sup>9</sup>. Thus, the relative goods/time intensity is obtained by dividing the monetary values by the corresponding monthly time spent amounts. For each activity and subpopulation, we calculate the ratio of the goods to time inputs allocated to commodity production.

As observed previously, housing takes relatively large shares of total expenditure compared to the time inputs for home maintenance. By contrast, commodity amounts per time spent on transport, clothing, education, leisure and other expenditures take lower values relative to food. One of the interesting findings from this statistics summary is that good intensity of health with personal care time spending is very low. Even if average monthly time spent on health with personal care activities takes the second highest values (such as 239 hours) among other activities, the average monetary expenditure amount took very low values.

Table 2 reports  $RDPs_{t_i/x_i}$  of time use over goods as the elasticity of substitution between time and commodity use in domestic production for the period from 2007 to 2013<sup>10</sup>. The estimation results shows that time use in domestic production is substituted with commodity use since they all take negative values for all groups. There isn't a unitary variation between time use and commodity use which means that a percentage changes in consumption causes relatively lower changes in time use. Elasticity results confirm that time use in two necessities, housing and food, is scarce in domestic production since households have a tendency to decrease in time spent relative to an increase in commodity use. The results are greater for food while smaller for housing for the years from 2007 to 2013. The last column in Table 2 reports the average elasticity values for these years. Finally, the estimation results report that clothing, health with personal cares, leisure, other expenditures, education and transport have higher discretionary time uses in domestic production as supposed by the theory.

Table 2: Time Use Demand Elasticity of Commodity Used in Domestic Production  
(Whole population, from 2007 to 2013)

Et/x	2007	2008	2009	2010	2011	2012	2013 Average	
Food	-0.170*** (0.01)	-0.195*** (0.01)	-0.162*** (0.01)	-0.141*** (0.01)	-0.125*** (0.01)	-0.111*** (0.01)	-0.110*** (0.01)	<b>-0,145</b>
Health and Perso. Care	-0.036*** (0.00)	-0.037*** (0.00)	-0.024*** (0.00)	-0.040*** (0.00)	-0.037*** (0.00)	-0.031*** (0.00)	-0.050*** (0.00)	<b>-0,036</b>
Housing	-0.183*** (0.01)	-0.244*** (0.01)	-0.204*** (0.01)	-0.184*** (0.01)	-0.233*** (0.01)	-0.255*** (0.01)	-0.258*** (0.01)	<b>-0,223</b>
Clothing	-0.020*** (0.00)	-0.036*** (0.00)	-0.029*** (0.01)	-0.038*** (0.01)	-0.054*** (0.00)	-0.042*** (0.00)	-0.042*** (0.00)	<b>-0,037</b>
Education	-0.072*** (0.01)	-0.092*** (0.01)	-0.101*** (0.01)	-0.075*** (0.00)	-0.090*** (0.01)	-0.091*** (0.00)	-0.092*** (0.00)	<b>-0,088</b>
Transport	-0.073*** (0.00)	-0.089*** (0.00)	-0.086*** (0.00)	-0.094*** (0.00)	-0.080*** (0.00)	-0.096*** (0.00)	-0.100*** (0.00)	<b>-0,088</b>
Leisure	-0.035*** (0.00)	-0.050*** (0.00)	-0.054*** (0.00)	-0.048*** (0.00)	-0.045*** (0.00)	-0.041*** (0.00)	-0.043*** (0.00)	<b>-0,045</b>
Others	-0.061*** (0.01)	-0.048*** (0.01)	-0.068*** (0.01)	-0.047*** (0.01)	-0.050*** (0.00)	-0.062*** (0.01)	-0.053*** (0.01)	<b>-0,056</b>

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

<sup>9</sup> Summary statistics on time use and monetary expenditures are given at the Appendix.

<sup>10</sup> The elasticity estimation results for all years are given at the Appendix from Table 15 to Table 21.

According to elasticity of time use commodities in domestic production by age reported in Table 3, the time use in education, transport and other activities are complementary for all ages. Therefore, the degree of complementarity increased for education and transport from 2007 to 2013. This result confirms the fact that any changes in consumption of education and transport for the younger population require more time spent on them than it would for the older population.

Table 3: Time Use Demand Elasticity of Commodities Used in Domestic Production (By age from 2007 to 2013)

		Age between 15-24						
		2007	2008	2009	2010	2011	2012	2013
Food		-0.216*** (0.03)	-0.150*** (0.03)	-0.116*** (0.03)	-0.150*** (0.03)	-0.402*** (0.03)	-0.390*** (0.03)	-0.375*** (0.03)
Health and Perso. Care		-0.094*** (0.00)	-0.071*** (0.00)	-0.072*** (0.00)	-0.061*** (0.00)	-0.088*** (0.00)	-0.088*** (0.00)	-0.087*** (0.00)
Housing		-0.391*** (0.02)	-0.284*** (0.02)	-0.276*** (0.02)	-0.285*** (0.02)	-0.472*** (0.02)	-0.413*** (0.02)	-0.447*** (0.02)
Clothing		-0.176*** (0.03)	-0.311*** (0.03)	-0.265*** (0.03)	-0.367*** (0.03)	-0.275*** (0.03)	-0.326*** (0.03)	-0.333*** (0.03)
Education		2.539*** (0.44)	2.525*** (0.41)	2.254*** (0.22)	2.436*** (0.20)	2.402*** (0.12)	2.481*** (0.10)	2.321*** (0.12)
Transport		0.249*** (0.01)	0.390*** (0.01)	0.404*** (0.01)	0.395*** (0.01)	0.291*** (0.01)	0.309*** (0.01)	0.298*** (0.01)
Leisure		-0.544*** (0.01)	-0.585*** (0.01)	-0.592*** (0.01)	-0.589*** (0.01)	-0.564*** (0.01)	-0.527*** (0.01)	-0.537*** (0.01)
Others		0.391*** (0.07)	0.239*** (0.06)	0.253*** (0.07)	0.240*** (0.07)	0.372*** (0.06)	1.415*** (0.09)	1.560*** (0.08)
		Age between 25-34						
		2007	2008	2009	2010	2011	2012	2013
Food		-0.175*** (0.03)	-0.094** (0.03)	-0.165*** (0.03)	-0.150*** (0.03)	-0.338*** (0.03)	-0.323*** (0.02)	-0.331*** (0.02)
Health and Perso. Care		-0.098*** (0.00)	-0.070*** (0.00)	-0.072*** (0.00)	-0.064*** (0.00)	-0.088*** (0.00)	-0.092*** (0.00)	-0.083*** (0.00)
Housing		-0.505*** (0.02)	-0.450*** (0.02)	-0.441*** (0.02)	-0.473*** (0.02)	-0.615*** (0.02)	-0.613*** (0.02)	-0.617*** (0.02)
Clothing		-0.286*** (0.03)	-0.368*** (0.03)	-0.376*** (0.03)	-0.385*** (0.03)	-0.227*** (0.03)	-0.101*** (0.03)	-0.074** (0.02)
Education		1.949*** (0.44)	1.923*** (0.41)	1.725*** (0.22)	1.892*** (0.20)	1.839*** (0.12)	1.972*** (0.10)	1.852*** (0.12)
Transport		0.260*** (0.01)	0.384*** (0.01)	0.411*** (0.01)	0.383*** (0.01)	0.261*** (0.01)	0.266*** (0.01)	0.264*** (0.01)
Leisure		-0.578*** (0.01)	-0.607*** (0.01)	-0.584*** (0.01)	-0.613*** (0.01)	-0.589*** (0.01)	-0.545*** (0.01)	-0.550*** (0.01)
Others		1.008*** (0.06)	0.921*** (0.06)	0.871*** (0.06)	0.891*** (0.06)	1.028*** (0.05)	2.040*** (0.08)	2.151*** (0.08)
		Age between 35-44						
		2007	2008	2009	2010	2011	2012	2013
Food		-0.171*** (0.03)	-0.081** (0.03)	-0.107*** (0.03)	-0.101*** (0.03)	-0.313*** (0.03)	-0.180*** (0.03)	-0.176*** (0.02)
Health and Perso. Care		-0.086*** (0.00)	-0.061*** (0.00)	-0.060*** (0.00)	-0.054*** (0.00)	-0.077*** (0.00)	-0.076*** (0.00)	-0.069*** (0.00)
Housing		-0.467*** (0.02)	-0.408*** (0.02)	-0.385*** (0.02)	-0.401*** (0.02)	-0.551*** (0.02)	-0.539*** (0.02)	-0.509*** (0.02)
Clothing		-0.070* (0.03)	-0.202*** (0.03)	-0.158*** (0.03)	-0.194*** (0.03)	-0.067* (0.03)	-0.007 (0.03)	0.000 (0.03)
Education		1.388** (0.44)	1.350** (0.41)	1.131*** (0.22)	1.288*** (0.20)	1.223*** (0.12)	1.550*** (0.10)	1.408*** (0.12)
Transport		0.209*** (0.01)	0.324*** (0.01)	0.362*** (0.01)	0.314*** (0.01)	0.226*** (0.01)	0.218*** (0.01)	0.204*** (0.01)
Leisure		-0.482*** (0.01)	-0.507*** (0.01)	-0.493*** (0.01)	-0.507*** (0.01)	-0.495*** (0.01)	-0.445*** (0.01)	-0.448*** (0.01)
Others		1.054*** (0.06)	0.942*** (0.06)	0.849*** (0.06)	0.916*** (0.06)	1.022*** (0.05)	2.031*** (0.08)	2.120*** (0.08)

Age between 45-54							
	2007	2008	2009	2010	2011	2012	2013
Food	-0.168*** (0.03)	-0.082** (0.03)	-0.117*** (0.03)	-0.101*** (0.03)	-0.252*** (0.03)	-0.217*** (0.02)	-0.223*** (0.02)
Health and Perso. Care	-0.059*** (0.00)	-0.038*** (0.00)	-0.045*** (0.00)	-0.041*** (0.00)	-0.058*** (0.00)	-0.053*** (0.00)	-0.054*** (0.00)
Housing	-0.298*** (0.02)	-0.269*** (0.02)	-0.269*** (0.02)	-0.260*** (0.02)	-0.363*** (0.02)	-0.312*** (0.02)	-0.323*** (0.02)
Clothing	-0.089** (0.03)	-0.189*** (0.03)	-0.178*** (0.03)	-0.150*** (0.03)	-0.129*** (0.03)	-0.073** (0.03)	-0.056* (0.03)
Education	1.315** (0.44)	1.303** (0.41)	1.060*** (0.22)	1.281*** (0.20)	1.245*** (0.12)	1.211*** (0.10)	1.095*** (0.12)
Transport	0.156*** (0.01)	0.291*** (0.01)	0.309*** (0.01)	0.275*** (0.01)	0.167*** (0.01)	0.157*** (0.01)	0.158*** (0.01)
Leisure	-0.304*** (0.01)	-0.324*** (0.01)	-0.322*** (0.01)	-0.325*** (0.01)	-0.335*** (0.01)	-0.286*** (0.01)	-0.312*** (0.01)
Others	0.993*** (0.07)	0.877*** (0.06)	0.807*** (0.06)	0.894*** (0.06)	1.000*** (0.05)	1.978*** (0.09)	2.069*** (0.08)

Age between 55-64							
	2007	2008	2009	2010	2011	2012	2013
Food	-0.077** (0.03)	-0.047 (0.03)	-0.102*** (0.03)	-0.077* (0.03)	-0.075** (0.03)	-0.140*** (0.02)	-0.104*** (0.02)
Health and Perso. Care	-0.037*** (0.00)	-0.003 (0.00)	-0.009** (0.00)	-0.010** (0.00)	-0.024*** (0.00)	-0.029*** (0.00)	-0.024*** (0.00)
Housing	-0.136*** (0.02)	-0.146*** (0.02)	-0.148*** (0.02)	-0.139*** (0.02)	-0.161*** (0.02)	-0.112*** (0.02)	-0.101*** (0.02)
Clothing	-0.212*** (0.03)	-0.384*** (0.03)	-0.380*** (0.03)	-0.354*** (0.03)	-0.195*** (0.03)	-0.191*** (0.03)	-0.174*** (0.03)
Education	0.937* (0.45)	0.988* (0.41)	0.795*** (0.23)	1.018*** (0.21)	0.913*** (0.12)	0.820*** (0.11)	0.678*** (0.12)
Transport	0.104*** (0.01)	0.231*** (0.01)	0.267*** (0.01)	0.202*** (0.01)	0.105*** (0.01)	0.107*** (0.01)	0.097*** (0.01)
Leisure	-0.117*** (0.01)	-0.135*** (0.01)	-0.148*** (0.01)	-0.140*** (0.01)	-0.148*** (0.01)	-0.113*** (0.01)	-0.120*** (0.01)
Others	0.826*** (0.07)	0.827*** (0.06)	0.708*** (0.07)	0.749*** (0.07)	0.876*** (0.06)	1.919*** (0.09)	1.942*** (0.09)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

As can be seen in Table 4, there is a substitution between time and commodity use in domestic production relative to the education level of the male<sup>11</sup>. However, it is surprising to see that complementarity can only be observed in transport and other expenditure groups. Furthermore, the scarcity in time use for food increased by the number of years of education present in the male population. That is to say, the part of time use in food decreased as an increasing trend since there is a strong substitution between time use and commodity use in food. In other words, good intensive consumption increased relative to the education levels of males for each year. The substitution in clothing takes the largest values for secondary and tertiary education levels. These results indicate that time use for food and housing in a household's full budget becomes scarcer when commodity uses increase between these years. We can intuitively grasp the underlying logic by observing that complementarity in health and personal care, the increase in transportation and how the degree of substitution decreases for clothing expenditures.

<sup>11</sup> We chose to give only the years 2007, 2010 and 2013. The rest of the years see the Appendix.

Table 4: Time Use Demand Elasticity of Commodity Used in Domestic Production  
(By education of male for 2007, 2010 and 2013)

2007(Male)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	-0.847*** (0.04)	-1.268*** (0.02)	-1.731*** (0.04)	-1.662*** (0.07)
Health and Perso. Care	-0.016*** (0.00)	0.015*** (0.00)	0.052*** (0.00)	0.044*** (0.00)
Housing	-0.455*** (0.02)	-0.678*** (0.02)	-0.946*** (0.02)	-1.053*** (0.04)
Clothing	-0.117* (0.05)	-1.332*** (0.03)	-1.553*** (0.05)	-0.697*** (0.13)
Education	0.011 (0.13)	-0.486*** (0.06)	-0.111 (0.07)	-0.429*** (0.08)
Transport	0.110*** (0.01)	0.298*** (0.01)	0.392*** (0.01)	0.440*** (0.01)
Leisure	-0.073*** (0.02)	-0.044*** (0.01)	-0.026* (0.01)	-0.081*** (0.01)
Others	0.357*** (0.07)	0.220*** (0.04)	0.322*** (0.04)	0.393*** (0.05)
2010(Male)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	-0.892*** (0.04)	-1.280*** (0.03)	-1.633*** (0.04)	-1.376*** (0.06)
Health and Perso. Care	-0.015** (0.00)	0.015*** (0.00)	0.057*** (0.00)	0.046*** (0.00)
Housing	-0.403*** (0.03)	-0.611*** (0.02)	-0.773*** (0.02)	-0.962*** (0.03)
Clothing	-0.164** (0.05)	-1.469*** (0.03)	-1.681*** (0.05)	-0.628*** (0.09)
Education	-0.497*** (0.11)	-0.609*** (0.04)	-0.245*** (0.04)	-0.450*** (0.05)
Transport	0.114*** (0.02)	0.355*** (0.01)	0.428*** (0.01)	0.476*** (0.01)
Leisure	-0.107*** (0.02)	-0.076*** (0.01)	-0.035** (0.01)	-0.101*** (0.01)
Others	0.292*** (0.06)	0.187*** (0.04)	0.282*** (0.04)	0.408*** (0.04)
2013(Male)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	-0.979*** (0.03)	-1.433*** (0.02)	-1.794*** (0.04)	-1.490*** (0.05)
Health and Perso. Care	-0.048*** (0.00)	0.013*** (0.00)	0.040*** (0.00)	0.060*** (0.00)
Housing	-0.465*** (0.02)	-0.713*** (0.02)	-0.943*** (0.02)	-1.209*** (0.02)
Clothing	-0.652*** (0.05)	-1.525*** (0.03)	-1.541*** (0.05)	-0.835*** (0.06)
Education	-0.703*** (0.08)	-0.534*** (0.03)	-0.196*** (0.03)	-0.231*** (0.03)
Transport	0.092*** (0.01)	0.316*** (0.01)	0.390*** (0.01)	0.447*** (0.01)
Leisure	-0.029* (0.01)	-0.000 (0.01)	0.049*** (0.01)	0.031** (0.01)
Others	0.427*** (0.08)	0.168*** (0.04)	0.286*** (0.04)	0.296*** (0.04)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

As expected the elasticity in food, housing maintenance, clothing and education have positive values for females relative to education level, meaning that there is an important complementarity between time use and commodity (see Table 5)<sup>12</sup>. The intensity of complementarity takes the largest elasticities for tertiary-level educated females. The degree of complementarity for food, housing and clothing is the lowest for those females who have higher level of education. Additionally, time use scarcity in leisure for higher-educated

<sup>12</sup> We chose to give only years 2007, 2010 and 2013. For the other years see the Appendix.

females is higher than for females with only a primary education. This is a likely explanation for why females who are educated to a higher level have less time for leisure activities due to the fact that they are taking part in the labour market; hence a more intensive rate of commodity consumption. It is interesting to observe for primary and secondary level-educated females that there is a substitution between time use and commodity combination for both health and personal care while there is complementarity for tertiary and higher educated females. Generally speaking, time use in transport and leisure decreases due to an increasing demand for food, health and personal care, housing, clothing, education and other expenditures with respect to the education level of females. In this respect, it can be concluded that females demand more time use in domestic activities than males since females have more complementary input use in domestic production than males.

Table 5: Time Use Demand Elasticity of Commodity Used in Domestic Production  
(By education of female for 2007, 2010 and 2013)

2007(Female)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	0.927*** (0.03)	0.952*** (0.02)	0.930*** (0.04)	0.782*** (0.05)
Health and Perso. Care	-0.043*** (0.00)	-0.012*** (0.00)	0.031*** (0.00)	0.034*** (0.01)
Housing	0.623*** (0.02)	0.752*** (0.02)	0.772*** (0.03)	0.455*** (0.04)
Clothing	0.522*** (0.03)	0.522*** (0.02)	0.406*** (0.03)	0.198*** (0.05)
Education	0.274*** (0.07)	0.429*** (0.05)	0.502*** (0.07)	-0.090 (0.09)
Transport	-0.392*** (0.01)	-0.316*** (0.01)	-0.186*** (0.01)	-0.147*** (0.02)
Leisure	-0.054*** (0.01)	0.008 (0.01)	0.045*** (0.01)	-0.253*** (0.02)
Others	0.008 (0.06)	-0.051 (0.05)	0.170 (0.09)	0.296*** (0.08)
2010(Female)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	0.965*** (0.03)	0.999*** (0.03)	0.970*** (0.04)	0.821*** (0.05)
Health and Perso. Care	-0.047*** (0.00)	-0.015*** (0.00)	0.027*** (0.00)	0.022*** (0.01)
Housing	0.681*** (0.02)	0.818*** (0.02)	0.826*** (0.03)	0.506*** (0.03)
Clothing	0.467*** (0.03)	0.473*** (0.03)	0.320*** (0.03)	0.156*** (0.04)
Education	0.035 (0.05)	0.271*** (0.04)	0.471*** (0.05)	-0.021 (0.06)
Transport	-0.357*** (0.01)	-0.282*** (0.01)	-0.149*** (0.01)	-0.025 (0.02)
Leisure	-0.130*** (0.01)	-0.048*** (0.01)	-0.001 (0.01)	-0.295*** (0.02)
Others	0.032 (0.06)	-0.005 (0.04)	0.192** (0.07)	0.252*** (0.06)
2013(Female)	Primary Education	Secondary Education	Tertiary Education	Higher Education
Food	0.772*** (0.03)	0.853*** (0.02)	0.872*** (0.03)	0.751*** (0.04)
Health and Perso. Care	-0.061*** (0.00)	-0.029*** (0.00)	0.021*** (0.00)	0.002 (0.00)
Housing	0.532*** (0.02)	0.692*** (0.02)	0.750*** (0.02)	0.595*** (0.03)
Clothing	0.395*** (0.02)	0.374*** (0.02)	0.273*** (0.03)	0.073* (0.03)
Education	-0.046 (0.04)	0.221*** (0.03)	0.435*** (0.04)	0.087* (0.04)
Transport	-0.407*** (0.01)	-0.316*** (0.01)	-0.182*** (0.01)	-0.113*** (0.01)
Leisure	-0.066*** (0.01)	-0.006 (0.01)	0.059*** (0.01)	-0.196*** (0.01)
Others	0.221 (0.16)	0.140** (0.05)	-0.181** (0.07)	0.131** (0.05)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

Finally, Table 6 shows a general picture of how time use scarcity may differ according to family types. Time use scarcity for food, housing, clothing tends to increase for married couples without children which implies the existence of substitution in these groups. However, couples without children have complementary-type household production for food, housing, clothing, education after having children, which in turn means that they sacrifice the largest part of their time resources for their children. They compensate for this time loss by lessening their time use in health and personal care activities, transportation and their leisure time activities, by way of favouring more commodity intensive household production. Conversely, single people show time use substitution with commodity for food while time use with commodity becomes complementary for the singles having children. Single people with children show increasing time use in health with personal care, housing and for clothing, in Turkey.

Table 6: Time Use Demand Elasticity of Commodity Use in Domestic Production  
(By family type for 2013)

Age	Married without children	Married with children	Single persons without children	Single persons with children
Food	-0.077*** (0.02)	1.560*** (0.03)	-0.173*** (0.04)	0.130*** (0.03)
Health and Perso. Care	0.008** (0.00)	-0.039*** (0.00)	0.005 (0.01)	0.007* (0.00)
Housing	-0.054*** (0.01)	0.873*** (0.02)	-0.025 (0.03)	0.049** (0.02)
Clothing	-0.075*** (0.02)	1.311*** (0.04)	-0.023 (0.04)	0.141*** (0.03)
Education	-0.064 (0.03)	0.369*** (0.05)	-0.088 (0.05)	-0.066 (0.04)
Transport	0.020** (0.01)	-0.433*** (0.01)	-0.014 (0.02)	-0.017 (0.01)
Leisure	0.022** (0.01)	-0.073*** (0.01)	0.007 (0.02)	0.002 (0.01)
Others	0.068 (0.04)	0.079 (0.07)	0.215** (0.07)	0.068 (0.05)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Authors calculation from TUS in 2006 and HBS for the years between 2007 and 2013 inclusive conducted by TURKSTAT

#### 4. Conclusion

In this paper we propose measuring relative domestic production scarcity of time use through the estimation of time use demand elasticity of commodity use in domestic activity. The method proposed here combines the methodology proposed by Gronau and Hamermesh (2006) and Hamermesh (2008). We integrate domestic production technology as the good intensity of time use into scarcity in time use and monetary expenditure which enables us to better differentiate for which consumption groups the combination of time use and commodity are complementary or substitutable in domestic production. To this end, we use two different datasets: the Time Use Survey for 2006 and the Household Budget Survey for the years 2007 to 2013 for Turkey. We match these datasets by using a new method proposed by Rubin's (1986) which gives reliable matching results between time use values and monetary expenditure values from both dataset. Our methodology enables us to understand the reason behind increasing time scarcity in households' domestic activities by identifying the level of substitution and complementarity between time use and market good use for all consumption groups in domestic production. We broke down the population into subpopulations according to age, education level, sex, living area etc. so as to better

understand time use tendencies for the households. The main results that can be gleaned from our analysis are as follows:

- The scarcity of the time use in two necessities such as housing and food increased over the years since households have a tendency to decrease time spent with respect to an increase in commodity use. We also observed that the elasticity results are greater for food while smaller for housing. The average elasticity values report that clothing, health with personal care, leisure, other expenditures, education and transport have higher discretionary time uses in domestic production than supposed by the theory.
- However, the substitution relationship does not hold when we broke down by age. The time use in education, transport and other activities became complementary when we measure for five different age group categories. Education and transportation take the largest values for the youth subpopulation ages 15 to 24 while the smallest values for these categories is present in from ages 55 to 64.
- Furthermore, we observe that there is also complementarity between transport and other groups when we consider males with respect to their education level. The elasticity values change according to education level. We can intuitively grasp the underlying logic by observing that the complementarity in health and personal care, transportation increase owing to decreasing time use demand for clothing expenditures for males with respect to their education level.
- On the other hand, the time use elasticity results indicate a complementary relationship between time use and market good use at food, housing maintenance, clothing and health with personal care for females relative to their education level. Generally speaking, time scarcity in transport and leisure increase due to growing time use demands for food, health and personal care, housing, clothing, education and other expenditures again, relative to the education level of females in question.
- In this respect, it can be concluded that females are more time scarce and more complementary in domestic activities than males due to simply the fact that they have more time use demanded nature in domestic activities. The daily tasks of females such as child care, house and family maintenance promote our findings. In fact, the elasticity results for different household types confirm our findings. The food is complementary for single parents or couples with children while it is substitutable for those who do not have children. The same is also true for housing and clothing categories.

## References

- Aktuna-Gunes, A.T, C. Starzec and F. Gardes (2014), “Une évaluation de la taille de l'économie informelle par un système complet de demande estimé sur données monétaires et temporelles”, *Revue Economique*, 65,4, p. 567–590.
- Aktuna-Gunes, A.T, F. Gardes and C. Starzec (2016), “Informal Markets, Domestic Production and Demand Elasticities: A Case Study for Turkey”, *Economics Bulletin*, Forthcoming.
- Alpman, A. (2016), “Implementing Rubin's alternative multiple-imputation method for statistical matching in Stata”, *Stata Journal*, Volume 16,3.
- Alpman, A. and F. Gardes (2016), “Welfare Analysis of the Allocation of Time During the Great Recession”, Working Paper, Centre d'Economie de la Sorbonne (CES), 2015.12- ISSN: p.1955-611X.

- Canelas, C., F. Gardes and S. Salazar (2014), "Price and Income Elasticities in LAC Countries: The Importance of Domestic Production", Working Paper, Centre d'Economie de la Sorbonne (CES), 2014.38 - ISSN:p. 1955-611X. 2014
- Gardes, F. and C. Starzec (2009), "Polish Households' Behavior in the Regular and Informal Economies", *Revue Economique*, 2009/5, 60.
- Baral, R., G. C. Davis and W. You (2011) "Consumption Time in Household Production: Implications for the Goods-time Elasticity of Substitution", *Economics Letters*, 112, p.139–140
- Becker, G.S. (1965), "A Theory of the Allocation of Time", *The Economic Journal*, Vol. 75, 299, p. 493–517
- Becker G.S. and Michael. "On the New Theory of Consumer Behavior." *Swedish Journal of Economics*, 75.4 (1973): 378-396.
- Chin, Y.M. (2008), "A Household Production Model of Demand for Childcare and Meals: Theory and Evidence from the Philippines", *Review of Economics of the Household*, 6(1), p.47–64.
- Davis, G. C. and W. You (2013), "Estimates of returns to scale, elasticity of substitution, and the thrifty food plan meal poverty rate from a direct household meal production function", *Food Policy*, 43, p. 204–212.
- Gardes F. (2016), "The estimation of price elasticities and the value of time in a domestic framework: an application on French micro-data", *Annals of Economics and Statistics*, Forthcoming.
- Gardes F. and P. Merrigan (2005), "Individual needs and social pressure: Evidence on the Easterlin hypothesis using repeated cross-section surveys of Canadian households", *Journal of Economic Behavior & Organization*, Volume 66, Issues 3–4, p. 582–596
- Gronau, R. and D. Hamermesh, (2006) "Time vs. goods: the value of measuring household technologies", *Review of Income and Wealth*, 52, p.1–16.
- Gronau, R. (1986), Home production—a survey. In O. Ashenfelter & R. Layard (Eds.), *Handbook of labor economics*, Handbooks in economics series, No. 5 (Vol. 1, pp. 273–304). New York, Amsterdam and Oxford: North-Holland, distributed in North America by Elsevier Science.
- Hamermesh, D.S., (2008), "Direct estimates of household production", *Economic Letters*, 98, p. 31–34.
- Mincer, J. (1963), "Market Prices, Opportunity Costs, and Income Effects". In *Measurement in Economics*, ed. C. Christ. Stanford, Calif.: Stanford University Press, p.67-82.
- Moriarity, C., and F. Scheuren (2003), "A Note on Rubin's Statistical Matching Using File Concatenation with Adjusted Weights and Multiple Imputations", *Journal of Business & Economic Statistics*, 21, p. 65–73.
- Robert, A. P. and L. W. Michael (1975), "The Relevance of the Household Production Function and Its Implications for the Allocation of Time", *Journal of Political Economy*, Vol. 83, 2, p. 255-278.
- Rubin, D. B. (1986), "Statistical Matching Using File Concatenation with Adjusted Weights and Multiple Imputations", *Journal of Business & Economic Statistics*, 4, p. 87–94.
- Rubin, D. B. (1987), *Multiple imputation for non-response in surveys*, New York: John Wiley & Sons.

## Appendix:

### *Elasticity of time use substitution:*

Following Becker and Michael (1973, p.383), the full expenditure can be written as

$$p_i^f z_i = m_i + \omega t_i \quad (1)$$

Let  $m_i$  is monetary expenditure ( $p_i x_i$ ) where  $p$  denotes monetary prices. Where  $\omega$  is the opportunity cost of time use activities,  $p^f$  is the full price<sup>13</sup> which is the price index of final commodities ( $z_i$ ). The equation measures the monetary value of domestic production ( $p_i^f z_i$ ) by adding the monetary costs ( $m_i$ ) and monetary values of time spent ( $\omega t_i$ ) for the activity  $i$ . The full price is the derivative of the full expenditure over  $z_i$  as:

$$p_i^{f_s} = p_i \frac{\partial x_i}{\partial z_i} + \omega \frac{\partial t_i}{\partial z_i} \quad (2)$$

The index  $s$  in  $p_i^{f_s}$  is used to specify full price in terms of monetary value of marginal substitution between time use and commodity use when domestic production is changing ( $\partial z_i$ ). There are two information that can be gleaned from equation (2): The left hand side of this equation is considered as full price since it is defined as a function of time use activities  $t_i$ . Besides this it enables us derive how the price of domestic production changes.

Using full price in (2) with the full expenditure equation (1) we can write the monetary expenditures as

$$m_i = \left( p_i \frac{\partial x_i}{\partial z_i} + \omega \frac{\partial t_i}{\partial z_i} \right) z_i - \omega t_i \quad (3)$$

By dividing both sides with  $t_i$  we get

$$\frac{m_i}{t_i} = p_i \frac{\partial x_i}{\partial z_i} \frac{z_i}{t_i} + \omega \frac{\partial t_i}{\partial z_i} \frac{z_i}{t_i} - \omega \quad (4)$$

Multiplying the first operation at the right hand side in the equation (4) by  $(x_i/x_i)$  doesn't change the equation.

$$\frac{m_i}{t_i} = p_i \frac{\partial x_i}{\partial z_i} \frac{z_i}{t_i} \left( \frac{x_i}{x_i} \right) + \omega \frac{\partial t_i}{\partial z_i} \frac{z_i}{t_i} - \omega \quad (5)$$

The equation (5) can be further simplified as

$$\frac{m_i}{t_i} = \left( \frac{m_i}{t_i} \right) \epsilon_{x_i/z_i} + \omega (\epsilon_{t_i/z_i} - 1) \quad (6)$$

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<sup>13</sup> In fact, the price of final good  $Z_i$  depends on the price of its input components. In the Beckerian theory, each final good is supposed to be homogeneous of degree 1. An invariant scale price index for each commodity can be constructed.

Where  $\varepsilon_{x_i/z_i}$  and  $\varepsilon_{t_i/z_i}$  measures the domestic production elasticity of commodity use and the domestic production elasticity of time use respectively. The equation (6) becomes

$$\begin{aligned} \frac{m_i}{t_i}(1 - \varepsilon_{x_i/z_i}) &= \omega(\varepsilon_{t_i/z_i} - 1) \\ \Leftrightarrow \frac{m_i}{t_i} &= \omega \frac{(\varepsilon_{t_i/z_i} - 1)}{(1 - \varepsilon_{x_i/z_i})} \end{aligned} \quad (7)$$

Hypothesis:  $\frac{(\varepsilon_{t_i/z_i} - 1)}{(1 - \varepsilon_{x_i/z_i})} = \varepsilon_{t_i/x_i}$  if and only if the technology used in domestic production gives  $\frac{\partial x_i}{\partial z_i} = \frac{\partial t_i}{\partial z_i}$

Proof: Supposing that a Leontief technology allows the quantities of the time and commodity factors to be proportional to the activity:

$$x_i = \xi_i z_i \quad ; \quad t_i = \theta_i z_i \quad \text{which yields} \quad \tau_i = \frac{t_i}{x_i} = \frac{\theta_i}{\xi_i} \quad (8)$$

(i) We can get that  $\varepsilon_{t_i/z_i} - \varepsilon_{x_i/z_i} = \left( \frac{\partial t_i}{t_i} - \frac{\partial x_i}{x_i} \right) \frac{\partial z_i}{z_i}$  which yields to two solutions:

$$\left. \begin{aligned} 1. \quad & \left( \frac{\partial t_i}{t_i} \left( \frac{\partial x_i}{x_i} \cdot \frac{x_i}{\partial x_i} \right) - \frac{\partial x_i}{x_i} \right) \frac{\partial z_i}{z_i} = (\varepsilon_{t_i/x_i} - 1) \varepsilon_{x_i/z_i} \\ 2. \quad & \left( \frac{\partial t_i}{t_i} - \frac{\partial x_i}{x_i} \left( \frac{\partial t_i}{t_i} \cdot \frac{t_i}{\partial t_i} \right) \right) \frac{\partial z_i}{z_i} = (1 - \varepsilon_{x_i/t_i}) \varepsilon_{t_i/z_i} \end{aligned} \right\} \begin{aligned} & (\varepsilon_{t_i/x_i} - 1) \varepsilon_{x_i/z_i} = (1 - \varepsilon_{x_i/t_i}) \varepsilon_{t_i/z_i} \end{aligned} \quad (9)$$

(ii) The equality  $(\varepsilon_{t_i/x_i} - 1) \varepsilon_{x_i/z_i} = (1 - \varepsilon_{x_i/t_i}) \varepsilon_{t_i/z_i}$  in (9) implies that

$$\frac{(\varepsilon_{t_i/x_i} - 1)}{(1 - \varepsilon_{x_i/t_i})} = \varepsilon_{t_i/x_i} \quad \text{or} \quad \varepsilon_{t_i/z_i} = \frac{(\varepsilon_{t_i/x_i} - 1)}{(1 - \varepsilon_{x_i/t_i})} \varepsilon_{x_i/z_i} \quad (10)$$

By using the second equation (10) in (7) we get

$$\frac{m_i}{t_i} = \omega \frac{\left( \left[ \frac{(\varepsilon_{t_i/x_i} - 1)}{(1 - \varepsilon_{x_i/t_i})} \varepsilon_{x_i/z_i} \right] - 1 \right)}{(1 - \varepsilon_{x_i/z_i})} = \frac{(\varepsilon_{t_i/x_i} - 1) \varepsilon_{x_i/z_i} - (1 - \varepsilon_{x_i/t_i})}{(1 - \varepsilon_{x_i/t_i})(1 - \varepsilon_{x_i/z_i})} \quad (11)$$

The optimum combination of inputs in the production of  $z_i$  is determined by familiar condition that the marginal rate of substitution in production equals to  $\frac{\partial z_i / \partial t_i}{\partial z_i / \partial x_i} = \frac{x_i}{t_i}$ , (see

Gronau, 1986, p:276, equation (9)). Thus, we can get  $\varepsilon_{t_i/x_i} = \varepsilon_{x_i/t_i}$ . The equation (11) can also be written as

$$\frac{m_i}{t_i} = \omega \frac{(\varepsilon_{t_i/x_i} - 1)(\varepsilon_{x_i/z_i} - 1)}{(1 - \varepsilon_{x_i/t_i})(\varepsilon_{x_i/z_i} - 1)} \quad (12)$$

further as

$$\frac{m_i}{t_i} = \omega \varepsilon_{t_i/x_i} \quad (13)$$

since  $\left(\frac{\varepsilon_{t_i/x_i} - 1}{1 - \varepsilon_{x_i/t_i}}\right) = \varepsilon_{t_i/x_i}$  as given at the first equality in the equation (10).

The equations from (1) to (13) indicates that the time use elasticity of commodity use used by Hamermesh (2008), Baral et al. (2011), Davis and You (2013) and Canelas et al. (2014) is equals to.

$$\frac{\partial \left(\frac{m_i}{t_i}\right)}{\partial \omega} = \varepsilon_{t_i/x_i} \quad (14)$$

In this specification we used  $\omega$  instead of market wage  $w$  as fixed wage assumption made by those authors. As a matter of fact, difficulties determining a convenient opportunity cost would be expected to bias the measurement of time allocation decisions, especially for those in developing economies for two reasons: firstly, if consumers all pay the same market prices for consumption goods, variation in earnings across individuals results in cross-sectional variation in the shadow prices for consumption goods and, as a result, estimated Engel curves will, by omitting these shadow price effects, tend to underestimate the true income effects of earnings intensive goods<sup>14</sup>. Secondly, it is more convenient to assume that monetary expenditures are determined by domestic production technology and by time scarcity which in turn determines the shadow wage rates. If labor supply is supposed to be endogenously determined under market conditions, time scarcity (i.e. used for the domestic production) depends totally on the relationship between income and non-labor time. The higher the labor supply and the lower the non-labor time, hence the greater the shadow price of time<sup>15</sup> and good intensive consumption. However, it is still optimistic to believe that in the case of developing economies, that average time costs are equal to marginal time costs of different activities and that marginal costs are what determine behavior. In fact, constraints in elastic labor markets may increase the adjustment and transaction costs which would in turn likely render shadow wages lower than market wage rates. Thus, it becomes more reasonable to consider that shadow wages are expected to be different among activities and that households may try to compensate any loss due to market constraints or to inflation and decreasing incomes by replacing monetary expenditures with domestic production, which in turn depends on the capacity of combining time spent with market commodities. Be that as it may, for any given shadow wage rate, the welfare of households would depend on the complementary and substitutable nature of household domestic production

<sup>14</sup> See Chiappori and Lewbel (2015)

<sup>15</sup> See Gronau (1986).

Table 7: Summary Statistics on Time Spent (for 8 activities by categorical variables)

2006 TUS average for Time (hrs/month)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	TOTAL
<b>Age</b>									
15-24	94	201	61	29	125	102	430	170	1212
<i>Std. Dev.</i>	77	105	74	39	135	110	304	193	606
25-34	94	192	55	26	82	87	333	253	1123
<i>Std. Dev.</i>	44	89	48	34	72	56	186	152	343
35-44	108	236	72	33	82	109	453	268	1361
<i>Std. Dev.</i>	62	131	69	40	95	75	273	190	545
45-54	124	303	92	38	79	135	608	293	1672
<i>Std. Dev.</i>	71	154	86	49	112	96	315	273	704
55-64	120	287	92	36	49	119	599	223	1524
<i>Std. Dev.</i>	72	159	93	50	94	98	286	262	715
65	102	226	71	26	26	86	524	121	1181
<i>Std. Dev.</i>	60	162	72	41	59	81	289	244	717
<b>Area</b>									
Rural	121	247	96	37	60	109	511	243	1425
<i>Std. Dev.</i>	76	168	96	50	87	90	322	267	778
Urban	98	234	61	28	69	102	461	221	1273
<i>Std. Dev.</i>	58	139	60	39	96	83	290	211	625
<b>Husband</b>									
<b>Education</b>									
Without Diplome	120	257	86	35	50	102	549	192	1391
<i>Std. Dev.</i>	77	184	82	49	86	101	336	269	829
Primary education	115	260	82	35	65	113	513	257	1441
<i>Std. Dev.</i>	65	148	82	46	88	85	294	240	652
Secondary education	97	225	60	25	87	103	436	249	1282
<i>Std. Dev.</i>	52	108	54	31	112	72	266	200	521
Superior education	87	227	58	25	79	107	466	211	1260
<i>Std. Dev.</i>	48	110	53	32	99	73	234	166	421
<b>Wife Education</b>									
Without Diplome	140	304	106	42	65	125	645	253	1681
<i>Std. Dev.</i>	79	181	97	56	99	99	333	302	822
Primary education	112	252	77	33	74	113	488	259	1408
<i>Std. Dev.</i>	55	131	70	41	91	80	271	213	545
Secondary education	92	229	60	26	85	105	434	247	1278
<i>Std. Dev.</i>	45	97	58	33	96	71	248	184	414
Superior education	82	238	52	22	78	106	432	254	1264
<i>Std. Dev.</i>	41	110	36	23	90	67	206	187	333
<b>TOTAL</b>	106	239	74	31	66	104	479	228	1327
<b>Std. Dev.</b>	66	150	76	43	93	86	303	232	687

Source: Authors' calculations from Time Use Survey data covering 2006

Table 8: 2007 Summary Statistics on Expenditure

2007 HBS Expenditures (Mean) (monthly TL)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	Income (Mean) (monthly TL)
<b>Age</b>									
15-24	361,666	88,505	433,199	92,531	46,391	152,789	33,505	23,528	123,935
<i>Std. Dev.</i>	209,028	252,921	338,553	157,023	443,749	328,596	115,722	71,729	259,403
25-34	331,785	101,926	447,954	87,270	16,673	170,748	36,972	14,247	475,201
<i>Std. Dev.</i>	215,663	252,527	355,135	141,028	88,194	420,261	155,181	68,885	807,634
35-44	338,346	80,777	441,729	89,058	51,856	158,893	38,163	23,704	598,521
<i>Std. Dev.</i>	188,829	179,099	334,178	155,878	421,819	354,555	114,751	77,955	889,073
45-54	360,830	100,567	491,493	91,129	41,332	187,470	36,191	24,109	658,605
<i>Std. Dev.</i>	209,560	300,508	382,899	163,664	258,549	396,789	126,205	80,356	1041,902
55-64	359,469	113,637	490,352	79,155	20,258	148,729	25,277	13,076	533,163
<i>Std. Dev.</i>	207,004	336,114	508,358	137,682	416,392	394,083	85,828	60,041	742,538
65	319,999	71,533	412,618	54,867	10,836	103,729	22,293	11,645	402,975
<i>Std. Dev.</i>	205,151	156,624	363,521	103,102	71,136	288,063	145,938	50,638	544,967
<b>Area</b>									
Rural	356,278	79,844	284,000	72,657	14,166	114,758	23,649	12,516	327,943
<i>Std. Dev.</i>	232,972	255,267	290,138	131,112	87,721	279,851	163,720	48,423	562,954
Urban	342,149	99,294	531,913	92,304	44,178	180,188	38,700	22,949	498,891
<i>Std. Dev.</i>	192,998	250,914	379,666	156,573	402,042	405,595	105,169	79,933	857,240
<b>Family Status</b>									
Couple without children	288,264	77,826	470,481	51,775	1,838	111,421	17,567	6,089	529,181
<i>Std. Dev.</i>	173,057	261,731	513,350	98,719	18,850	271,963	66,282	46,802	758,136
Couple with children	331,874	91,621	460,660	90,916	47,840	168,809	36,725	23,351	480,025
<i>Std. Dev.</i>	173,906	249,232	348,207	154,084	434,029	391,658	96,157	79,076	875,482
Single	177,810	56,477	453,037	43,517	10,341	67,590	23,105	6,320	688,989
<i>Std. Dev.</i>	117,206	113,324	409,228	87,640	106,030	257,218	81,206	53,553	561,062
Monoparental family	279,310	74,732	412,232	67,600	29,668	101,942	25,798	15,105	429,861
<i>Std. Dev.</i>	150,990	162,909	301,591	121,139	137,502	284,885	71,697	58,154	515,154
Other family*	411,882	104,596	431,385	91,245	19,846	165,797	34,715	17,507	331,305
<i>Std. Dev.</i>	261,352	268,482	367,041	155,709	95,956	366,732	189,011	62,766	570,975
<b>Husband Education</b>									
Without Diplôme	286,450	50,255	280,259	50,637	4,730	56,620	11,403	8,490	477,422
<i>Std. Dev.</i>	182,011	127,756	263,740	88,266	28,295	183,974	44,133	38,943	402,113
Primary education	313,446	77,315	420,372	68,233	18,982	124,838	25,408	15,214	879,507
<i>Std. Dev.</i>	184,507	226,950	359,034	127,234	136,597	299,739	80,313	53,082	798,137
Secondary education	324,797	101,613	539,730	96,157	40,973	208,470	45,058	23,914	1289,422
<i>Std. Dev.</i>	170,673	211,051	379,071	151,699	199,346	468,179	131,296	92,909	1334,760
Superior education	377,348	172,872	707,886	162,265	129,067	314,855	75,829	36,882	1834,039
<i>Std. Dev.</i>	216,077	376,435	450,436	220,238	878,621	557,249	145,866	133,490	1510,540
<b>Wife Education</b>									
Without Diplôme	336,747	68,843	336,445	63,507	8,839	95,014	15,372	12,072	27,233
<i>Std. Dev.</i>	193,271	241,302	387,870	113,572	65,038	256,041	50,666	55,365	106,146
Primary education	322,050	83,175	448,379	74,252	27,394	150,506	30,426	18,272	62,516
<i>Std. Dev.</i>	187,077	233,470	333,691	134,188	235,183	357,608	92,372	66,149	257,563
Secondary education	333,741	123,187	599,883	121,362	70,610	230,557	50,609	24,806	200,522
<i>Std. Dev.</i>	181,312	254,556	393,605	182,768	287,531	434,238	117,935	103,754	418,856
Superior education	394,553	214,112	825,316	204,930	165,269	431,712	107,733	37,409	907,277
<i>Std. Dev.</i>	204,923	350,864	498,535	237,914	1204,092	684,146	171,935	106,511	746,904
TOTAL	346,732	92,985	451,495	85,931	34,443	158,964	33,818	19,565	443,439
<i>Std. Dev.</i>	206,915	252,493	371,700	149,074	334,510	370,787	127,343	71,422	778,251

Source: Authors' calculations from Household Budget Survey data covering 2007

Table 9: 2008 Summary Statistics on Expenditure

2008 HBS Expenditures (Mean) (monthly TL)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	Income (Mean) (monthly TL)
<b>Age</b>									
15-24	413,806	94,910	533,332	110,475	42,216	239,209	39,410	30,523	145,861
<i>Std. Dev.</i>	253,030	186,790	372,051	175,665	138,640	508,846	91,643	135,578	331,704
25-34	377,443	99,064	534,205	98,965	17,673	248,080	40,657	21,570	516,190
<i>Std. Dev.</i>	290,265	189,174	370,958	204,036	101,684	538,110	94,544	231,607	715,629
35-44	384,473	91,043	546,572	100,730	48,405	260,739	49,028	28,152	752,018
<i>Std. Dev.</i>	283,472	175,239	372,283	156,134	176,284	566,107	103,853	72,451	1257,395
45-54	406,047	106,584	579,749	105,407	41,165	270,820	42,464	28,258	802,315
<i>Std. Dev.</i>	231,620	227,179	394,288	221,445	148,580	583,454	98,773	86,693	1258,463
55-64	411,153	93,592	554,583	82,778	15,593	206,896	36,777	18,990	654,347
<i>Std. Dev.</i>	250,182	190,178	401,854	234,164	88,760	480,034	102,174	67,826	948,045
65	372,561	85,616	481,206	58,133	9,136	148,568	29,524	12,040	501,935
<i>Std. Dev.</i>	244,082	339,299	362,596	123,252	48,627	432,099	94,253	47,952	814,303
<b>Area</b>									
Rural	401.7533	76.52272	346.839	77.92331	12.06104	160.493	24.64397	13.17369	406.2253
<i>Std. Dev.</i>	274.1271	225.8883	298.9652	152.7302	50.1878	333.8275	70.44077	45.54644	698.4683
Urban	391.5616	104.7242	629.0425	106.2576	41.38076	274.2406	48.27761	30.11982	603.6165
<i>Std. Dev.</i>	258.7763	204.2739	378.2935	203.8458	155.7326	596.8776	106.6854	160.4729	1056.252
<b>Family Status</b>									
Couple without children	334.1279	92.92725	517.7789	51.84112	3.826229	161.6814	27.86999	10.26318	597.331
<i>Std. Dev.</i>	197.3352	342.0405	372.0705	97.64247	36.32323	401.2813	89.28103	59.25751	793.4539
Couple with children	378.2935	97.11482	559.5451	103.0597	44.94135	262.9507	45.54471	28.2007	588.8519
<i>Std. Dev.</i>	249.1814	190.6525	387.0886	209.6136	165.0588	579.0176	97.16017	78.39497	1099.173
Single	226.308	57.96433	437.705	48.53572	17.64633	70.59987	22.35822	11.42666	777.4085
<i>Std. Dev.</i>	156.1598	150.9409	330.3202	107.1865	114.8897	208.9827	54.37214	48.1316	689.3612
Monoparental family	265.6461	75.92429	477.4547	68.09393	37.28215	111.3964	26.89804	21.14667	285.563
<i>Std. Dev.</i>	151.3292	226.4025	305.2612	150.3604	173.6951	270.931	62.12617	67.969	476.981
Other family*	468.3588	99.01897	525.9795	108.3865	19.002	239.5897	38.82579	24.93459	417.8813
<i>Std. Dev.</i>	300.2584	192.7858	368.1167	178.3602	64.72575	497.5287	104.0661	222.4446	728.2334
<b>Husband Education</b>									
Without Diplôme	313.4323	51.08523	315.4457	50.63092	4.614592	68.34836	19.14055	6.411653	534.3664
<i>Std. Dev.</i>	237.2895	132.9464	275.9476	108.3199	20.43084	182.5461	82.40169	28.54251	468.6597
Primary education	355.2458	76.65955	479.7969	73.42585	18.64168	182.0304	28.75617	18.41363	1034.105
<i>Std. Dev.</i>	212.5361	204.6719	308.2854	121.8519	80.0047	423.3254	74.44519	61.77831	1164.257
Secondary education	382.5837	116.2889	626.4621	110.5093	40.60212	282.4701	54.18266	27.10693	1409.968
<i>Std. Dev.</i>	370.5834	233.7704	360.8745	176.4344	116.3037	582.2817	98.97772	79.30842	1293.661
Superior education	428.4227	176.504	864.6368	159.1125	96.30801	496.6898	91.74464	48.90359	2082.116
<i>Std. Dev.</i>	229.0827	291.6883	510.5471	347.9791	309.0958	856.8024	146.8582	270.8786	1758.454
<b>Wife Education</b>									
Without Diplôme	381.0616	64.16048	380.7492	71.9504	10.89997	130.4951	23.53653	12.92849	33.62173
<i>Std. Dev.</i>	241.6634	140.3668	304.8703	141.2851	75.04984	333.0943	88.02776	44.75333	126.9314
Primary education	372.2055	86.92672	522.1476	85.48496	24.17724	220.2858	35.25303	22.389	80.00122
<i>Std. Dev.</i>	282.78	223.3124	315.75	193.9577	82.39577	471.1587	82.67019	138.8306	252.0684
Secondary education	382.0063	142.173	731.1988	116.879	60.73236	393.5872	67.89642	37.28152	247.2815
<i>Std. Dev.</i>	192.3914	288.0655	420.4841	177.4468	176.9562	826.8522	111.3938	96.73216	432.8933
Superior education	426.8167	216.1085	982.0585	181.0146	130.7654	607.5488	122.9488	44.03502	1093.49
<i>Std. Dev.</i>	198.0774	273.9106	570.1874	219.3096	402.1575	862.0266	171.6503	115.3041	1038.103
TOTAL	394.7337	95.94671	541.2087	97.43875	32.2552	238.8375	40.92181	24.84545	542.1799
<i>Std. Dev.</i>	263.6865	211.6369	378.7516	189.8713	132.9363	531.8173	97.48381	135.8065	963.6343

Source: Authors' calculations from Household Budget Survey data covering 2008

Table 10: 2009 Summary Statistics on Expenditure

<b>2009 HBS Expenditures (Mean) (monthly TL)</b>	<b>Food</b>	<b>Health and Personal Care</b>	<b>Housing</b>	<b>Clothing</b>	<b>Education</b>	<b>Transportation</b>	<b>Leisure</b>	<b>Other</b>	<b>Income (Mean) (monthly TL)</b>
<b>Age</b>									
15-24	416.398	147.1417	511.8631	97.18317	42.25607	221.5553	47.13736	27.78641	172.3893
<i>Std. Dev.</i>	272.7543	264.2596	359.7526	160.9724	130.5322	454.9523	133.5409	84.73817	369.8481
25-34	368.7017	175.3898	537.7389	90.79984	18.71828	253.9345	43.39319	18.5518	611.8637
<i>Std. Dev.</i>	245.64	540.8876	376.0568	164.2595	85.53373	539.3345	97.99861	63.76925	964.8225
35-44	379.2582	139.6492	530.8311	87.91457	49.61575	231.5221	49.12582	26.29723	768.5489
<i>Std. Dev.</i>	234.8843	220.9457	381.0539	148.2389	188.981	500.7055	118.4381	77.47152	1106.329
45-54	415.9668	157.1109	574.3198	95.01629	45.87034	257.6625	48.86749	28.51696	1052.371
<i>Std. Dev.</i>	285.3704	491.3739	427.2629	172.0973	160.5719	527.4095	127.5777	86.98161	14028.38
55-64	417.5357	140.9985	547.2669	77.64732	16.20172	202.9224	42.52335	17.74104	729.2666
<i>Std. Dev.</i>	297.8684	529.3656	468.274	171.0394	78.91505	437.4451	125.6551	62.1945	1492.463
65	376.0943	110.3847	462.4753	50.11914	9.47919	124.8382	26.36603	11.29938	519.5553
<i>Std. Dev.</i>	276.399	456.7756	513.7349	112.1214	62.29998	334.0914	88.747	53.90518	982.5381
<b>Area</b>									
Rural	413.9607	101.9843	325.0765	70.91211	14.13487	154.6203	27.50464	14.92129	507.5751
<i>Std. Dev.</i>	305.0933	228.39	299.4554	137.981	72.69303	321.0757	95.40493	56.80536	9904.915
Urban	385.0777	173.6539	634.8931	95.61638	43.27497	261.1615	52.9327	26.94663	677.3923
<i>Std. Dev.</i>	244.8923	495.9809	411.9135	167.4387	156.6295	544.1161	128.3933	80.49215	1226.128
<b>Family Status</b>									
Couple without children	333.6641	125.8643	536.7395	57.30319	8.504586	191.5958	33.26698	13.95971	732.1319
<i>Std. Dev.</i>	263.2644	468.0149	521.5673	127.6343	93.40129	448.9987	108.3656	58.95155	1178.939
Couple with children	379.8864	155.0467	551.3764	93.57415	45.60229	249.6376	49.10046	26.83141	618.641
<i>Std. Dev.</i>	226.7128	498.3427	387.3398	157.0856	163.5271	530.5915	124.0256	77.73565	1215.849
Single	216.7923	85.6909	422.0486	54.08802	14.47359	76.39125	33.7596	12.85186	959.8218
<i>Std. Dev.</i>	179.3797	164.8378	337.9364	119.9326	59.20483	189.0486	105.9463	49.30236	1404.732
Monoparental family	294.2781	79.10045	450.3136	79.46983	30.60772	93.48997	26.57155	25.15041	183.8086
<i>Std. Dev.</i>	178.7819	95.5714	268.6317	111.8747	83.31949	167.3682	65.75963	81.09406	298.1606
Other family*	468.5586	156.8922	500.3316	90.72352	22.67716	214.2227	41.38585	19.95954	559.9878
<i>Std. Dev.</i>	321.2051	263.118	393.6709	174.02	87.70323	427.0182	115.4721	72.00779	10542.39
<b>Husband Education</b>									
Without Diplôme	322.2376	79.63115	324.3409	44.99038	6.954496	79.32565	19.01781	8.676598	533.8605
<i>Std. Dev.</i>	257.9479	379.6577	276.5893	106.8708	73.70599	219.4194	78.88356	45.44784	582.927
Primary education	358.6738	119.7553	474.1181	68.74287	18.40408	169.5336	31.00104	17.31327	1058.605
<i>Std. Dev.</i>	249.5491	244.0996	320.7205	133.4878	98.27112	346.1004	92.33855	62.48227	1245.903
Secondary education	361.0318	191.8583	650.7666	101.8485	46.03963	298.7461	64.45521	28.7232	2158.597
<i>Std. Dev.</i>	243.4728	687.0492	418.3869	152.6522	147.5749	649.4594	142.1258	80.20596	23281.59
Superior education	413.7521	253.7022	883.1315	156.0006	104.4011	468.7254	106.0858	44.69787	2399.034
<i>Std. Dev.</i>	248.0021	338.2467	674.8093	218.7776	268.2801	741.6611	157.2839	101.9638	2283.774
<b>Wife Education</b>									
Without Diplôme	396.1282	104.1127	383.8708	65.41984	8.543487	125.8588	26.0109	13.35194	53.49579
<i>Std. Dev.</i>	269.5663	370.7475	301.3001	128.9624	43.74276	280.5824	103.0623	57.91335	174.9796
Primary education	367.2729	138.3478	522.2192	77.34412	26.37584	217.2974	37.96446	20.68556	110.5906
<i>Std. Dev.</i>	245.2956	449.7652	329.8874	145.8802	92.2768	454.5746	99.9759	67.96162	382.0981
Secondary education	367.4686	187.2072	744.6935	107.1501	70.9226	366.7199	70.1186	35.05479	337.9549
<i>Std. Dev.</i>	245.0741	222.2112	503.0044	161.9417	264.3817	718.7292	126.8205	90.63354	631.437
Superior education	437.938	322.9926	1005.986	193.5823	137.5112	621.2222	135.0773	60.26179	1270.595
<i>Std. Dev.</i>	264.9839	428.5675	813.94	230.5577	314.0561	950.0227	181.4147	129.4157	1173.432
TOTAL	395.1637	148.9263	530.0465	86.89488	33.23495	224.5365	44.45936	22.94183	618.0615
<i>Std. Dev.</i>	266.4866	420.9549	409.3007	158.7011	133.3881	484.6395	118.0591	74.85998	5701.972

Source: Authors' calculations from Household Budget Survey data covering 2009

Table 11: 2010 Summary Statistics on Expenditure

<b>2010 HBS Expenditures (Mean) (monthly TL)</b>	<b>Food</b>	<b>Health and Personal Care</b>	<b>Housing</b>	<b>Clothing</b>	<b>Education</b>	<b>Transportation</b>	<b>Leisure</b>	<b>Other</b>	<b>Income (Mean) (monthly TL)</b>
<b>Age</b>									
15-24	423.3549	172.3523	551.3572	104.0198	45.10977	250.4196	49.92014	29.80841	186.83
<i>Std. Dev.</i>	267.0521	286.9866	430.5178	163.4575	140.4785	468.7317	110.9629	95.60065	377.7871
25-34	384.5433	178.6423	565.3106	95.85641	22.71091	301.4615	50.86006	21.69973	677.2432
<i>Std. Dev.</i>	269.4145	262.9042	393.1406	165.787	88.29082	644.8485	126.7221	78.05671	1050.958
35-44	402.5071	162.69	576.4205	102.3333	55.85769	286.8571	57.10353	30.24198	866.724
<i>Std. Dev.</i>	253.5117	223.000	464.1845	166.6363	210.2565	607.8745	128.7915	107.2771	1319.244
45-54	434.498	179.5349	611.9106	102.3661	51.36988	293.3995	53.62658	27.78763	917.8561
<i>Std. Dev.</i>	298.9617	371.2994	526.8103	175.2297	182.0769	554.2317	126.3376	88.66247	1531.652
55-64	425.1822	137.5429	572.3103	74.37428	17.49347	252.0789	46.98018	18.64065	812.6303
<i>Std. Dev.</i>	287.6194	260.424	427.2567	140.4738	89.23389	613.7959	137.5658	79.21386	1758.649
65	388.6923	121.6058	499.3558	57.02438	12.86425	154.5872	33.10848	15.65786	599.6293
<i>Std. Dev.</i>	340.0741	292.8778	400.9378	128.5882	79.32789	418.3563	119.1982	75.6029	891.9182
<b>Area</b>									
Rural	422.7616	113.4458	392.0109	80.76502	18.14273	203.6459	30.43286	18.25622	493.1907
<i>Std. Dev.</i>	301.218	195.7688	331.0958	149.379	86.6176	429.6159	80.13078	71.24404	1095.71
Urban	402.9366	186.2277	650.2687	100.4421	46.46173	294.6482	60.67047	28.89986	726.5451
<i>Std. Dev.</i>	273.4412	295.0287	470.1693	168.9314	162.7657	620.3537	142.9055	98.91611	1244.986
<b>Family Status</b>									
Couple without children	359.2354	121.6167	565.1878	55.0963	10.69248	234.4458	37.17284	11.99701	811.3958
<i>Std. Dev.</i>	264.0492	208.97	428.2312	108.2559	101.89	553.5067	115.749	51.68181	1406.178
Couple with children	402.7469	170.1558	591.1121	103.3993	50.58011	289.4893	58.91764	30.64728	685.6846
<i>Std. Dev.</i>	244.2521	238.1725	473.6623	159.5372	168.2705	610.7732	133.194	106.039	1211.85
Single	226.9221	80.80984	471.7799	52.6201	21.29535	77.54111	32.85397	12.65831	1038.996
<i>Std. Dev.</i>	161.8202	166.6234	437.7761	113.0726	147.6971	234.246	84.1327	52.29686	2278.127
Monoparental family	304.2876	99.17354	499.3965	94.69302	49.38981	103.8566	37.76125	24.25286	233.4184
<i>Std. Dev.</i>	158.0468	131.2968	469.0289	162.4557	187.4902	212.5743	77.91497	71.07382	504.5808
Other family*	470.5788	178.2621	536.0154	96.88485	23.82414	263.3595	43.92021	22.54276	493.6068
<i>Std. Dev.</i>	350.7781	346.6514	394.0058	188.3139	88.74783	520.9655	123.9881	74.68321	848.8921
<b>Husband Education</b>									
Without Diplôme	319.582	81.35441	352.9793	50.44732	6.08703	94.73488	21.15108	9.232518	579.281
<i>Std. Dev.</i>	231.4579	265.4901	263.4182	105.9114	44.50211	279.4916	77.92186	46.28693	496.0408
Primary education	378.0596	135.9514	507.3565	74.21685	21.47515	206.5318	35.38836	19.24818	1159.656
<i>Std. Dev.</i>	270.9379	228.4127	336.0177	133.1259	88.35952	442.0881	99.18924	82.49927	1038.692
Secondary education	386.0174	187.8915	652.8028	101.8342	54.51107	324.3999	63.39546	26.8638	1635.959
<i>Std. Dev.</i>	257.4066	293.0771	510.4852	154.3574	164.9526	633.1407	121.1746	83.04549	1591.866
Superior education	437.8052	277.1395	933.9302	170.6067	106.8979	569.6294	125.3482	48.88469	2607.239
<i>Std. Dev.</i>	264.8536	353.3204	693.7396	245.8914	328.6411	1006.679	207.9846	123.5092	3357.457
<b>Wife Education</b>									
Without Diplôme	396.1788	114.5174	426.5839	68.90926	9.841601	159.9724	29.53439	14.69208	70.84675
<i>Std. Dev.</i>	251.5049	271.306	314.5228	123.3497	38.48757	364.2685	104.1875	59.97763	226.3178
Primary education	392.4941	146.4983	544.6935	81.15694	30.67923	252.6693	41.63534	21.12842	122.7505
<i>Std. Dev.</i>	274.1546	229.8018	338.2306	143.7758	107.5077	504.608	99.90799	86.51105	297.9086
Secondary education	386.0463	221.1495	718.7075	121.2937	61.39696	415.1257	75.20822	33.45495	333.8259
<i>Std. Dev.</i>	226.3482	257.8562	441.0681	162.2727	180.4962	835.6162	132.741	96.89731	552.8201
Superior education	461.4089	353.5126	1102.303	190.8056	166.4247	726.1748	170.4044	64.44447	1532.274
<i>Std. Dev.</i>	257.7087	376.2868	966.3408	237.9469	437.5171	1111.241	245.9297	151.5069	1463.28
TOTAL	409.8796	164.2102	566.3999	93.82836	37.37428	265.9419	50.12726	25.24353	652.1451
<i>Std. Dev.</i>	281.586	286.1193	445.4465	161.8905	147.8792	564.2111	124.3862	90.09965	1215.667

Source: Authors' calculations from Household Budget Survey data covering 2010

Table 12: 2011 Summary Statistics on Expenditure

2011 HBS Expenditures (Mean) (monthly TL)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	Income (Mean) (monthly TL)
<b>Age</b>									
15-24	473.9578	214.2755	621.6175	127.1564	58.97401	340.2835	59.58665	39.78266	237.9266
<i>Std. Dev.</i>	315.821	450.1583	475.2347	188.239	223.4055	708.3006	148.8	140.193	524.1755
25-34	412.9828	214.4157	621.3465	109.7278	23.49111	399.5979	62.74856	25.80889	790.6176
<i>Std. Dev.</i>	289.6925	362.3965	444.6222	173.9258	94.43348	887.7196	161.0635	124.8689	1158.01
35-44	441.1366	198.2107	654.132	116.8593	72.40652	382.2185	66.55262	34.22484	1026.053
<i>Std. Dev.</i>	291.7154	273.2113	513.8349	183.2241	231.8518	820.8631	140.6836	97.84444	1455.588
45-54	470.5311	211.3154	680.2803	114.8133	58.81906	380.2534	67.12285	39.09078	1060.629
<i>Std. Dev.</i>	327.8043	453.0344	535.6418	185.7206	225.2573	778.32	181.7743	146.7956	2130.107
55-64	470.2062	176.8962	654.3075	88.85025	23.1776	315.1471	50.3732	27.08501	915.1186
<i>Std. Dev.</i>	323.3758	437.3198	512.2004	156.4961	127.0886	1126.692	157.5635	136.3166	1394.995
65	433.816	136.0594	604.6827	65.98481	18.20648	195.6369	43.34478	20.16261	724.4504
<i>Std. Dev.</i>	319.6614	344.5818	555.2427	127.4452	138.0908	534.8204	144.672	97.48979	1240.348
<b>Area</b>									
Rural	464.3129	153.0962	440.5236	89.52107	23.14321	250.7566	37.29403	23.01906	579.9028
<i>Std. Dev.</i>	331.3502	519.6036	401.7118	152.0395	150.9625	515.9536	116.7536	132.8296	1240.813
Urban	443.4306	218.6533	730.0701	117.6699	58.08808	398.7926	71.73593	36.36728	860.2581
<i>Std. Dev.</i>	301.0251	316.148	499.0202	185.3955	207.9561	942.7252	174.2536	123.8351	1450.101
<b>Family Status</b>									
Couple without children	392.6355	139.4497	632.3599	67.91135	11.17723	276.3742	45.98745	19.88416	904.4839
<i>Std. Dev.</i>	290.6752	231.8223	508.6977	135.3697	92.7749	711.1467	145.102	94.03155	1348.554
Couple with children	441.654	197.6727	646.01	116.4066	62.35046	396.6389	65.1457	37.95222	793.4961
<i>Std. Dev.</i>	282.897	293.2264	476.8838	174.1565	218.4562	951.5548	156.0907	140.7574	1507.573
Single	278.0099	141.7775	588.696	74.75254	25.58355	179.3363	46.17063	15.84748	1205.154
<i>Std. Dev.</i>	214.0629	253.7502	508.9235	211.7856	130.3021	545.7898	125.7657	56.84595	1631.937
Monoparental family	368.0203	182.3807	609.2866	98.70395	37.24379	249.8144	63.16014	23.82018	567.1565
<i>Std. Dev.</i>	235.474	241.5543	464.5553	175.0472	156.6231	576.9369	137.6601	68.1643	1358.738
Other family*	540.9944	238.3792	630.8876	118.878	34.5136	331.654	60.44434	28.92931	594.9973
<i>Std. Dev.</i>	373.2374	621.4174	503.9067	186.0873	174.3887	648.7054	178.1499	122.6809	1033.899
<b>Husband Education</b>									
Without Diplôme	362.5833	111.8651	419.1398	62.71077	6.863905	110.8082	22.41552	13.02557	709.0669
<i>Std. Dev.</i>	268.5032	427.895	307.4503	112.7926	39.02105	315.2503	67.71626	77.67365	838.3264
Primary education	406.9201	158.8691	556.9421	82.44828	23.30628	264.711	42.06769	21.95003	1368.381
<i>Std. Dev.</i>	286.4518	312.3066	356.2651	135.7752	99.0574	584.932	116.8376	86.03342	1723.556
Secondary education	411.5642	208.0317	733.1724	113.5333	46.3112	406.9498	67.15865	31.94842	1756.554
<i>Std. Dev.</i>	295.2149	238.263	500.8888	173.9354	133.8144	799.7239	138.4961	118.3242	1485.468
Superior education	482.5333	325.4869	1027.337	195.752	149.8943	723.4775	152.9629	66.49433	2790.897
<i>Std. Dev.</i>	311.8607	365.393	820.0847	299.8153	402.0468	1464.411	284.1981	202.2231	2867.074
<b>Wife Education</b>									
Without Diplôme	441.7671	132.1265	473.9011	80.41569	12.14366	191.3753	34.13481	19.82579	67.66326
<i>Std. Dev.</i>	293.1036	357.2633	329.6424	142.6624	54.70682	484.7692	129.8584	82.79227	216.4635
Primary education	422.9241	169.5459	604.438	92.10736	30.92886	318.8823	48.29178	23.67641	138.8449
<i>Std. Dev.</i>	297.1269	280.4719	367.8361	139.1441	103.5144	677.5392	116.8137	86.52891	359.653
Secondary education	427.9159	244.0126	825.1583	136.5142	80.50053	544.2886	88.90256	40.85081	370.0251
<i>Std. Dev.</i>	274.8428	271.7204	615.3008	212.3546	237.3509	1409.546	159.9909	122.9923	657.216
Superior education	510.9786	400.6553	1145.891	221.6635	210.4734	908.8248	183.5384	97.99971	1538.933
<i>Std. Dev.</i>	320.3316	374.3514	941.2426	282.6481	477.3562	1362.725	300.9592	325.3118	1453.931
TOTAL	449.3092	198.4952	639.4893	108.8526	45.8806	350.1471	60.20337	32.17223	771.8049
<i>Std. Dev.</i>	309.9818	391.5078	500.5366	175.9051	188.6965	823.5805	156.6048	126.4696	1405.523

Source: Authors' calculations from Household Budget Survey data covering 2011

Table 13: 2012 Summary Statistics on Expenditure

2012 HBS Expenditures (Mean) (monthly TL)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	Income (Mean) (monthly TL)
<b>Age</b>									
15-24	555.0402	264.1114	754.6929	163.4725	85.14159	412.9614	82.56767	44.6691	212.5308
<i>Std. Dev.</i>	421.3933	837.6312	580.5925	300.0948	302.582	802.3099	327.666	139.6198	539.2622
25-34	483.8164	278.4903	794.8186	145.2683	44.36711	517.0335	82.36388	32.6262	881.6238
<i>Std. Dev.</i>	352.8418	684.0588	650.5886	230.5723	203.9613	1028.541	193.7885	116.5325	1554.322
35-44	501.7667	236.3874	799.0105	145.3473	87.09318	473.7562	94.51344	45.61335	1102.741
<i>Std. Dev.</i>	344.2518	311.1017	592.1222	229.7155	278.4177	975.7139	230.871	150.9778	1467.082
45-54	533.1569	260.3449	845.7935	147.3417	89.18803	452.6792	85.91687	46.53008	1148.996
<i>Std. Dev.</i>	343.8604	610.5584	709.469	264.0628	316.4647	891.7415	322.5528	167.1992	1972.982
55-64	535.0128	201.5129	801.4962	119.9547	32.0432	341.129	69.53329	25.07567	1036.593
<i>Std. Dev.</i>	397.434	526.8935	826.3352	259.3894	180.579	728.2344	202.6866	84.33274	1875.731
65	484.2489	145.7964	682.7385	72.5908	14.37998	232.8006	50.86989	21.26061	775.3555
<i>Std. Dev.</i>	392.573	283.2429	759.3266	150.8768	74.59135	640.5721	246.1284	127.5202	1561.864
<b>Area</b>									
Rural	549.3199	194.491	566.0183	117.0609	26.85346	319.3116	42.80722	26.45098	619.3543
<i>Std. Dev.</i>	458.5373	934.9567	559.1316	274.7859	141.7453	671.6966	122.3984	111.0933	1209.805
Urban	500.8056	264.124	890.9776	149.5603	82.32374	477.3501	98.91209	43.52343	941.1253
<i>Std. Dev.</i>	327.0857	347.4338	697.2766	237.219	292.4984	967.9124	307.696	146.8732	1685.532
<b>Family Status</b>									
Couple without children	433.4402	170.0348	768.8939	84.68213	14.11066	320.7523	73.42538	23.06036	1023.758
<i>Std. Dev.</i>	292.3387	331.6484	905.1168	202.0721	117.6481	719.9159	274.1388	127.4715	1875.822
Couple with children	506.169	245.4534	807.547	149.4408	89.44838	468.7772	88.52575	44.96975	861.8819
<i>Std. Dev.</i>	332.6071	360.3105	630.1743	240.4786	306.3579	943.4059	287.1401	154.4947	1493.852
Single	316.1835	173.3497	688.6373	91.78462	29.59304	230.1853	61.8311	23.4108	1251.481
<i>Std. Dev.</i>	229.8156	310.1186	544.7904	232.1059	187.9381	653.6285	190.759	95.71944	1240.117
Monoparental family	411.4249	202.2028	754.8054	118.701	53.26046	300.3636	65.42707	28.57711	526.1635
<i>Std. Dev.</i>	247.1665	281.1354	511.1219	191.467	240.0185	842.3967	165.7267	98.19349	704.1913
Other family*	641.7833	289.7762	767.8447	157.0109	43.03144	443.2145	72.88147	34.50449	635.5366
<i>Std. Dev.</i>	490.6155	1067.635	663.445	298.2251	175.4119	871.7961	222.6043	105.2199	1616.68
<b>Husband Education</b>									
Without Diplôme	410.7638	103.9329	498.1714	74.42034	9.723397	141.9819	23.45913	14.53331	788.3824
<i>Std. Dev.</i>	359.3854	197.3537	468.7259	190.0317	55.46144	466.2806	94.94333	59.30897	1166.78
Primary education	467.8944	185.949	677.5734	104.381	30.95366	313.0187	50.63862	28.74961	1378.438
<i>Std. Dev.</i>	342.2325	464.7755	451.9707	197.7941	153.7208	618.0172	136.0581	144.2902	1404.028
Secondary education	472.1313	262.16	899.0457	149.7093	74.88734	484.4852	98.13759	41.34142	1977.744
<i>Std. Dev.</i>	302.8154	334.7344	862.589	222.7774	248.7501	1002.521	219.3832	124.3974	2318.135
Superior education	529.0771	402.9603	1224.352	224.326	179.8457	870.3895	212.41	69.68557	3054.535
<i>Std. Dev.</i>	314.5446	474.7971	951.8013	330.2379	446.339	1420.587	495.338	161.7883	2706.052
<b>Wife Education</b>									
Without Diplôme	518.9314	160.8944	580.8071	101.0875	17.77041	251.3543	37.14118	21.63089	74.61091
<i>Std. Dev.</i>	407.4183	672.5113	482.7144	224.6298	118.8243	651.5311	139.0492	127.9564	217.3984
Primary education	477.1413	194.3312	726.5103	114.1409	40.30585	364.1094	59.47234	32.48452	150.7145
<i>Std. Dev.</i>	311.5628	276.9206	459.1236	197.8294	143.1211	664.2176	138.8578	137.2894	347.3152
Secondary education	489.9832	306.7682	1015.175	168.1201	115.4402	632.1388	130.1088	47.24947	504.295
<i>Std. Dev.</i>	298.006	334.8585	796.2748	239.301	355.0136	1177.009	262.3431	135.0843	1497.322
Superior education	568.6751	493.1662	1419.294	265.6657	248.2676	1089.129	266.5185	94.06316	1756.066
<i>Std. Dev.</i>	339.7874	493.1902	1399.491	331.0173	537.332	1643.547	610.9532	200.4631	1579.232
TOTAL	516.6394	241.3976	784.9193	138.9533	64.21968	425.7704	80.60092	37.95143	836.1076
<i>Std. Dev.</i>	375.7673	606.3451	672.8674	250.5597	254.6854	885.3308	263.3569	136.4655	1553.759

Source: Authors' calculations from Household Budget Survey data covering 2012

Table 14: 2013 Summary Statistics on Expenditure

2013 HBS Expenditures (Mean) (monthly TL)	Food	Health and Personal Care	Housing	Clothing	Education	Transportation	Leisure	Other	Income (Mean) (monthly TL)
<b>Age</b>									
15-24	590.1036	263.887	767.4849	160.042	86.46631	452.5988	89.11475	52.33841	234.6825
Std. Dev.	399.0521	361.4163	587.3884	259.6943	280.5012	899.1495	227.4003	134.2794	524.6675
25-34	508.5634	289.4351	808.8753	146.7636	41.76376	528.9165	96.60312	34.61517	946.6514
Std. Dev.	327.9669	349.6756	558.8136	223.648	165.8084	961.4837	237.7305	107.876	1146.056
35-44	544.489	260.7163	816.7249	157.3906	100.1468	514.1982	104.2462	49.88883	1213.739
Std. Dev.	363.169	311.8504	604.9792	239.9958	315.8737	1089.636	241.5733	136.353	1906.381
45-54	584.7356	273.5782	862.1449	155.9635	97.96923	495.3303	100.2814	52.30023	1254.219
Std. Dev.	380.1313	390.7642	667.4495	260.998	315.1768	917.78	318.6471	152.723	2151.015
55-64	570.8602	213.3184	819.7332	112.5199	29.41338	378.0011	72.49694	28.83715	1046.012
Std. Dev.	370.2171	327.6733	672.0852	206.6638	158.9126	792.609	202.4369	96.56533	1489.758
65	527.5785	177.6265	732.6722	87.62281	21.31846	272.2271	56.86415	33.72793	821.6721
Std. Dev.	418.8817	356.2214	774.0483	208.2714	151.4466	764.4736	203.4606	220.3412	1798.221
<b>Area</b>									
Rural	577.9547	183.828	554.1411	113.6054	26.502	344.2829	55.88371	33.85935	635.3764
Std. Dev.	428.1179	340.3142	601.6213	216.5844	134.7194	756.1915	192.9677	153.5658	1119.176
Urban	543.7219	288.1906	920.0215	156.7665	88.41315	513.6524	106.2276	48.15293	1021.606
Std. Dev.	347.6653	352.0602	612.0454	247.8106	292.6665	1005.077	264.1306	135.4514	1763.495
<b>Family Status</b>									
Couple without children	459.3845	193.4812	802.8647	92.69824	14.07884	393.908	67.1932	31.7794	1062.097
Std. Dev.	343.9285	341.139	785.4438	202.5156	101.1974	1001.608	209.6497	199.3162	1968.273
Couple with children	553.2386	275.2659	833.4764	158.9041	95.06896	508.4674	101.6501	48.23247	949.9843
Std. Dev.	349.5633	359.1643	644.9924	250.5628	300.3862	989.954	255.499	134.0804	1730.648
Single	339.4382	182.3017	687.4103	83.31098	27.01623	194.9881	66.60482	28.29056	1260.686
Std. Dev.	252.6546	302.4899	534.1204	155.7228	181.5637	533.3077	198.6908	127.9754	1280.127
Monoparental family	436.3281	211.9616	749.8066	109.2634	45.90344	224.6626	53.86729	44.54773	550.7762
Std. Dev.	287.0672	288.3228	516.8728	164.8352	210.2469	468.7094	117.8941	146.0534	666.5261
Other family*	672.9469	260.3971	765.4007	149.5793	48.73185	471.1641	82.97152	43.0155	663.000
Std. Dev.	440.1722	351.6045	535.1436	245.5126	203.9791	870.8348	248.7914	124.985	1090.168
<b>Husband Education</b>									
Without Diplôme	444.8698	125.5782	526.6765	78.03216	12.11722	125.2206	30.179	24.08088	792.8005
Std. Dev.	395.9636	270.7057	626.7763	186.2426	86.20571	306.736	116.3307	210.3897	578.4646
Primary education	499.7972	203.8918	694.4433	105.3143	35.63837	344.6737	62.42792	29.66546	1506.881
Std. Dev.	334.5091	303.1616	474.1289	183.3714	138.1027	708.6619	182.4737	104.0164	1530.963
Secondary education	516.97	288.1887	910.0879	162.7925	75.11922	553.7968	102.2951	47.18815	2060.065
Std. Dev.	350.4793	358.2148	625.6233	266.9511	280.4738	1116.646	300.8204	146.3072	1872.136
Superior education	578.8908	439.752	1286.202	243.9699	199.9127	934.4441	221.4782	87.06354	3483.922
Std. Dev.	374.9223	446.985	882.2693	296.0017	483.0678	1460.205	373.6291	193.6977	3705.116
<b>Wife Education</b>									
Without Diplôme	543.2104	164.813	592.3153	100.6301	18.99742	267.342	46.39468	21.93705	78.17965
Std. Dev.	402.6053	309.8711	577.146	206.451	105.1436	612.8934	170.1471	76.96274	220.4119
Primary education	526.9172	226.0497	762.5509	124.6181	47.74463	399.8866	73.9756	34.57145	167.6655
Std. Dev.	336.9384	304.314	509.8815	209.0204	162.9763	740.8648	234.8271	144.3788	390.1165
Secondary education	509.4149	332.4116	1043.22	170.74	107.8912	703.7671	124.3326	62.49274	458.5241
Std. Dev.	287.2064	429.295	816.5318	238.2048	283.9585	1441.07	235.6294	170.2276	1035.446
Superior education	613.4311	529.379	1408.767	293.1385	278.7222	1232.168	272.0062	114.2355	1783.835
Std. Dev.	423.2148	459.8255	883.7722	352.8403	610.9947	1653.953	413.8865	238.2007	1644.582
TOTAL	554.631	254.9331	803.4255	143.0123	68.68377	459.679	90.18437	43.59796	898.5307
Std. Dev.	375.5119	351.7318	632.156	239.1475	254.8974	936.3174	244.8421	141.6298	1596.988

Source: Authors' calculations from Household Budget Survey data covering 2013

Table 15: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2007)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.170***	-0.036***	-0.183***	-0.020***	-0.072***	-0.073***	-0.035***	-0.061***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
ln (Income)	-0.037***	-0.001	-0.108***	-0.076***	-0.096***	0.021***	-0.046***	0.078***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.02)
ln (OECD Equivalence Scale HH Size)	-0.211***	-0.005	-0.071***	-0.107***	-0.290***	-0.020	-0.026*	0.125**
	(0.03)	(0.00)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.05)
Rate Children (N. of children/N. of Adult)	0.116**	0.003	0.055*	-0.003	0.415***	0.059***	0.062***	-0.023
	(0.04)	(0.00)	(0.03)	(0.04)	(0.08)	(0.01)	(0.01)	(0.06)
Ln (Age) (15-24)	-0.216***	-0.094***	-0.391***	-0.176***	2.539***	0.249***	-0.544***	0.391***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.44)	(0.01)	(0.01)	(0.07)
Ln (Age) (25-34)	-0.175***	-0.098***	-0.505***	-0.286***	1.949***	0.260***	-0.578***	1.008***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.44)	(0.01)	(0.01)	(0.06)
Ln (Age) (35-44)	-0.171***	-0.086***	-0.467***	-0.070*	1.388**	0.209***	-0.482***	1.054***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.44)	(0.01)	(0.01)	(0.06)
Ln (Age) (45-54)	-0.168***	-0.059***	-0.298***	-0.089**	1.315**	0.156***	-0.304***	0.993***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.44)	(0.01)	(0.01)	(0.07)
Ln (Age) (55-64)	-0.077**	-0.037**	-0.136**	-0.212**	0.937*	0.104***	-0.117**	0.826***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.45)	(0.01)	(0.01)	(0.07)
Married without children	0.122***	0.002	0.085***	0.137***	0.401**	-0.038***	-0.003	0.074
	(0.03)	(0.00)	(0.02)	(0.03)	(0.15)	(0.01)	(0.01)	(0.06)
Married with children	1.536***	-0.035***	0.820***	1.055***	0.041	-0.447***	-0.167**	0.188
	(0.06)	(0.01)	(0.04)	(0.06)	(0.29)	(0.02)	(0.03)	(0.16)
Single persons without children	0.983***	-0.018***	0.510***	0.699***	0.516**	-0.281***	-0.075***	0.119
	(0.04)	(0.01)	(0.03)	(0.04)	(0.16)	(0.02)	(0.02)	(0.08)
Single persons with children	0.368***	-0.001	0.222**	0.304***	0.479**	-0.096***	-0.018	0.036
	(0.03)	(0.00)	(0.02)	(0.03)	(0.15)	(0.01)	(0.01)	(0.06)
Primary Education (Male)	-0.847***	-0.016***	-0.455***	-0.117*	0.011	0.110***	-0.073***	0.357***
	(0.04)	(0.00)	(0.02)	(0.05)	(0.13)	(0.01)	(0.02)	(0.07)
Secondary Education (Male)	-1.268***	0.015***	-0.678***	-1.332***	-0.486***	0.298***	-0.044***	0.220***
	(0.02)	(0.00)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.04)
Tertiary Education (Male)	-1.731***	0.052***	-0.946***	-1.553***	-0.111	0.392***	-0.026*	0.322***
	(0.04)	(0.00)	(0.02)	(0.05)	(0.07)	(0.01)	(0.01)	(0.04)
Higher Education (Male)	-1.662***	0.044***	-1.053***	-0.697***	-0.429***	0.440***	-0.081***	0.393***
	(0.07)	(0.00)	(0.04)	(0.13)	(0.08)	(0.01)	(0.01)	(0.05)
Primary Education (Female)	0.927***	-0.043***	0.623***	0.522***	0.274***	-0.392***	-0.054***	0.008
	(0.03)	(0.00)	(0.02)	(0.03)	(0.07)	(0.01)	(0.01)	(0.06)
Secondary Education (Female)	0.952***	-0.012**	0.752***	0.522***	0.429***	-0.316***	0.008	-0.051
	(0.02)	(0.00)	(0.02)	(0.02)	(0.05)	(0.01)	(0.01)	(0.05)
Tertiary Education (Female)	0.930***	0.031***	0.772***	0.406***	0.502***	-0.186***	0.045***	0.170
	(0.04)	(0.00)	(0.03)	(0.03)	(0.07)	(0.01)	(0.01)	(0.09)
Higher Education (Female)	0.782***	0.034***	0.455***	0.198***	-0.090	-0.147***	-0.253***	0.296***
	(0.05)	(0.01)	(0.04)	(0.05)	(0.09)	(0.02)	(0.02)	(0.08)
Area (Rural=1)	0.004	0.013***	0.234***	-0.004	0.171***	0.031***	0.065***	-0.034
	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.00)	(0.01)	(0.02)
Constant	5.785***	5.648***	5.914***	4.171***	2.948***	4.470***	6.847***	4.052***
	(0.11)	(0.01)	(0.07)	(0.10)	(0.51)	(0.04)	(0.04)	(0.17)
R2	0.512	0.221	0.469	0.425	0.501	0.428	0.342	0.335
DF	20231.000	23247.000	22259.000	11823.000	3087.000	21696.000	14827.000	4185.000
BIC	51434.745	-36326.080	42472.941	23815.506	6018.422	11801.574	2643.845	7476.432

<sup>a</sup> The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2007 Turkish Household Budget Survey by Turkish Statistical Institute

Table 16: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2008)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.195***	-0.037***	-0.244***	-0.036***	-0.092***	-0.089***	-0.050***	-0.048***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
ln (Income)	-0.031**	-0.006***	-0.100***	-0.047***	-0.050***	0.030***	-0.040***	0.069***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
ln (OECD Equivalence Scale HH Size)	-0.035	0.004	0.013	-0.022	-0.135**	-0.008	-0.042***	0.171***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.04)
Rate Children (N. of children/N. of Adult)	0.046	0.009	0.077**	-0.022	0.154**	0.069***	0.043**	-0.017
	(0.04)	(0.00)	(0.03)	(0.04)	(0.05)	(0.02)	(0.01)	(0.05)
Ln (Age) (15-24)	-0.150***	-0.071***	-0.284***	-0.311***	2.525***	0.390***	-0.585***	0.239***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.41)	(0.01)	(0.01)	(0.06)
Ln (Age) (25-34)	-0.094**	-0.070***	-0.450***	-0.368***	1.923***	0.384***	-0.607***	0.921***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.41)	(0.01)	(0.01)	(0.06)
Ln (Age) (35-44)	-0.081**	-0.061***	-0.408***	-0.202***	1.350**	0.324***	-0.507***	0.942***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.41)	(0.01)	(0.01)	(0.06)
Ln (Age) (45-54)	-0.082**	-0.038***	-0.269***	-0.189***	1.303**	0.291***	-0.324***	0.877***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.41)	(0.01)	(0.01)	(0.06)
Ln (Age) (55-64)	-0.047	-0.003	-0.146***	-0.384***	0.988*	0.231***	-0.135***	0.827***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.41)	(0.01)	(0.01)	(0.06)
Married without children	0.005	-0.007*	-0.029	0.062*	0.153	-0.057***	-0.001	0.010
	(0.03)	(0.00)	(0.02)	(0.03)	(0.08)	(0.01)	(0.01)	(0.05)
Married with children	2.123***	-0.092***	1.133***	1.487***	0.688***	-0.675***	-0.040	-0.021
	(0.06)	(0.01)	(0.04)	(0.06)	(0.12)	(0.03)	(0.02)	(0.12)
Single persons without children	-0.097	-0.038***	-0.142**	0.114	0.115	-0.046	-0.014	0.024
	(0.07)	(0.01)	(0.05)	(0.08)	(0.11)	(0.03)	(0.03)	(0.11)
Single persons with children	0.201***	-0.019***	0.081***	0.247***	0.169*	-0.107***	-0.028*	0.039
	(0.03)	(0.00)	(0.02)	(0.03)	(0.08)	(0.01)	(0.01)	(0.06)
Primary Education (Male)	-1.240***	-0.020***	-0.568***	-0.013	-0.570***	0.205***	-0.086***	0.368***
	(0.04)	(0.01)	(0.03)	(0.06)	(0.12)	(0.02)	(0.02)	(0.07)
Secondary Education (Male)	-1.405***	0.013***	-0.655***	-1.549***	-0.583***	0.361***	-0.074***	0.271***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Tertiary Education (Male)	-1.875***	0.047***	-0.814***	-1.649***	-0.261***	0.427***	-0.067***	0.392***
	(0.04)	(0.00)	(0.02)	(0.06)	(0.05)	(0.01)	(0.01)	(0.04)
Higher Education (Male)	-1.765***	0.050***	-0.989***	-0.770***	-0.470***	0.475***	-0.096***	0.500***
	(0.06)	(0.00)	(0.03)	(0.11)	(0.05)	(0.01)	(0.01)	(0.05)
Primary Education (Female)	0.889***	-0.043***	0.655***	0.498***	0.126*	-0.357***	-0.078***	-0.034
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.06)
Secondary Education (Female)	0.924***	-0.012***	0.807***	0.503***	0.320***	-0.291***	-0.001	-0.052
	(0.02)	(0.00)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)	(0.04)
Tertiary Education (Female)	0.912***	0.029***	0.817***	0.370***	0.481***	-0.178***	0.014	0.145*
	(0.03)	(0.00)	(0.03)	(0.03)	(0.05)	(0.01)	(0.01)	(0.07)
Higher Education (Female)	0.760***	0.039***	0.537***	0.129**	0.152*	-0.124***	-0.269***	0.356***
	(0.05)	(0.01)	(0.03)	(0.04)	(0.06)	(0.02)	(0.02)	(0.06)
Area (Rural=1)	-0.022	0.004*	0.241***	0.103***	0.195***	0.056***	0.077***	-0.019
	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
Constant	6.049***	5.875***	6.347***	4.077***	2.938***	4.467***	7.068***	4.353***
	(0.10)	(0.01)	(0.07)	(0.10)	(0.44)	(0.04)	(0.04)	(0.15)
R2	0.566	0.217	0.495	0.445	0.542	0.437	0.368	0.358
DF	18524.000	22009.000	20497.000	10963.000	5265.000	20012.000	15445.000	5169.000
BIC	45942.679	-34367.052	38420.796	21887.208	9400.015	13693.868	3430.843	9396.209

<sup>a</sup> The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2008 Turkish Household Budget Survey by Turkish Statistical Institute

Table 17: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2009)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.162***	-0.024***	-0.204***	-0.029***	-0.101***	-0.086***	-0.054***	-0.068***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
ln (Income)	-0.045***	-0.003**	-0.108***	-0.053***	-0.080***	0.031***	-0.027***	0.065***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
ln (OECD Equivalence Scale HH Size)	-0.012	0.008*	0.036	-0.087**	-0.051	-0.059***	0.001	0.095*
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Rate Children (N. of children/N. of Adult)	-0.105**	-0.009*	-0.055*	0.026	0.080	0.098***	-0.006	-0.006
	(0.04)	(0.00)	(0.03)	(0.04)	(0.05)	(0.01)	(0.01)	(0.05)
Ln (Age) (15-24)	-0.116***	-0.072***	-0.276***	-0.265***	2.254***	0.404***	-0.592***	0.253***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.22)	(0.01)	(0.01)	(0.07)
Ln (Age) (25-34)	-0.165***	-0.072***	-0.441***	-0.376***	1.725***	0.411***	-0.584***	0.871***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.22)	(0.01)	(0.01)	(0.06)
Ln (Age) (35-44)	-0.107***	-0.060***	-0.385***	-0.158***	1.131***	0.362***	-0.493***	0.849***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.22)	(0.01)	(0.01)	(0.06)
Ln (Age) (45-54)	-0.117***	-0.045***	-0.269***	-0.178***	1.060***	0.309***	-0.322***	0.807***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.22)	(0.01)	(0.01)	(0.06)
Ln (Age) (55-64)	-0.102***	-0.009**	-0.148***	-0.380***	0.795***	0.267***	-0.148***	0.708***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.23)	(0.01)	(0.01)	(0.07)
Married without children	0.046	0.002	0.044*	0.091**	0.049	-0.032**	0.016	-0.021
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.04)
Married with children	1.813***	-0.089***	0.914***	1.152***	0.645***	-0.556***	-0.093***	0.024
	(0.05)	(0.01)	(0.04)	(0.06)	(0.09)	(0.02)	(0.02)	(0.09)
Single persons without children	0.093	-0.002	0.118**	0.036	-0.059	-0.071**	0.009	0.048
	(0.06)	(0.01)	(0.04)	(0.06)	(0.08)	(0.03)	(0.02)	(0.09)
Single persons with children	0.238***	-0.017***	0.143***	0.297***	0.020	-0.071***	-0.027*	-0.033
	(0.03)	(0.00)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.05)
Primary Education (Male)	-0.965***	-0.015***	-0.436***	0.067	-0.520***	0.135***	-0.053**	0.313***
	(0.04)	(0.00)	(0.03)	(0.05)	(0.09)	(0.02)	(0.02)	(0.07)
Secondary Education (Male)	-1.287***	0.012***	-0.618***	-1.429***	-0.623***	0.340***	-0.065***	0.234***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Tertiary Education (Male)	-1.687***	0.043***	-0.800***	-1.497***	-0.206***	0.412***	-0.061***	0.350***
	(0.04)	(0.00)	(0.02)	(0.06)	(0.04)	(0.01)	(0.01)	(0.04)
Higher Education (Male)	-1.524***	0.051***	-0.966***	-0.644***	-0.305***	0.430***	-0.026*	0.323***
	(0.06)	(0.00)	(0.03)	(0.10)	(0.05)	(0.01)	(0.01)	(0.04)
Primary Education (Female)	0.918***	-0.046***	0.657***	0.544***	0.008	-0.347***	-0.112***	-0.002
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.06)
Secondary Education (Female)	0.959***	-0.019***	0.780***	0.517***	0.225***	-0.306***	-0.045***	-0.080
	(0.03)	(0.00)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.04)
Tertiary Education (Female)	0.930***	0.020***	0.747***	0.387***	0.409***	-0.164***	-0.013	0.043
	(0.04)	(0.00)	(0.03)	(0.04)	(0.05)	(0.01)	(0.01)	(0.07)
Higher Education (Female)	0.833***	0.033***	0.524***	0.167***	0.209***	-0.120***	-0.124***	-0.026
	(0.05)	(0.01)	(0.04)	(0.05)	(0.06)	(0.02)	(0.02)	(0.06)
Area (Rural=1)	-0.015	0.011***	0.243***	0.100***	0.236***	0.056***	0.083***	-0.066**
	(0.01)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Constant	6.027***	5.883***	6.193***	4.166***	3.577***	4.530***	7.001***	4.749***
	(0.10)	(0.01)	(0.07)	(0.11)	(0.26)	(0.04)	(0.04)	(0.16)
R2	0.516	0.184	0.458	0.408	0.536	0.426	0.313	0.282
DF	19077.000	22549.000	21135.000	11005.000	5680.000	20235.000	15204.000	4940.000
BIC	49218.145	-41290.207	40735.618	23114.643	10200.184	13975.395	4672.463	9032.186

<sup>a</sup> The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2009 Turkish Household Budget Survey by Turkish Statistical Institute

Table 18: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2010)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.141***	-0.040***	-0.184***	-0.038***	-0.075***	-0.094***	-0.048***	-0.047***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
ln (Income)	-0.053***	-0.007***	-0.129***	-0.081***	-0.099***	0.032***	-0.049***	0.068***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.02)
ln (OECD Equivalence Scale HH Size)	-0.026	-0.003	0.105***	-0.023	-0.123**	-0.031**	0.001	0.088*
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Rate Children (N. of children/N. of Adult)	-0.042	0.006	-0.119***	-0.071	0.102*	0.123***	0.009	-0.020
	(0.04)	(0.00)	(0.03)	(0.04)	(0.05)	(0.01)	(0.01)	(0.05)
Ln (Age) (15-24)	-0.150***	-0.061***	-0.285***	-0.367***	2.436***	0.395***	-0.589***	0.240***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.20)	(0.01)	(0.01)	(0.07)
Ln (Age) (25-34)	-0.150***	-0.064***	-0.473***	-0.385***	1.892***	0.383***	-0.613***	0.891***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.20)	(0.01)	(0.01)	(0.06)
Ln (Age) (35-44)	-0.101***	-0.054***	-0.401***	-0.194***	1.288***	0.314***	-0.507***	0.916***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.20)	(0.01)	(0.01)	(0.06)
Ln (Age) (45-54)	-0.101***	-0.041***	-0.260***	-0.150***	1.281***	0.275***	-0.325***	0.894***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.20)	(0.01)	(0.01)	(0.06)
Ln (Age) (55-64)	-0.077*	-0.010**	-0.139***	-0.354***	1.018***	0.202**	-0.140**	0.749***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.21)	(0.01)	(0.01)	(0.07)
Married without children	0.035	-0.001	0.014	0.083**	0.008	-0.035***	-0.001	-0.015
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.04)
Married with children	1.933***	-0.118***	1.014***	1.354***	0.514***	-0.564***	-0.066***	-0.014
	(0.05)	(0.01)	(0.04)	(0.06)	(0.09)	(0.02)	(0.02)	(0.09)
Single persons without children	-0.044	-0.012	0.080*	0.074	-0.061	-0.092***	0.009	-0.140
	(0.06)	(0.01)	(0.04)	(0.06)	(0.08)	(0.02)	(0.02)	(0.08)
Single persons with children	0.213***	-0.016***	0.092***	0.306***	0.014	-0.079***	-0.034**	0.039
	(0.03)	(0.00)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.05)
Primary Education (Male)	-0.892***	-0.015**	-0.403***	-0.164**	-0.497***	0.114***	-0.107***	0.292***
	(0.04)	(0.00)	(0.03)	(0.05)	(0.11)	(0.02)	(0.02)	(0.06)
Secondary Education (Male)	-1.280***	0.015***	-0.611***	-1.469***	-0.609***	0.355***	-0.076***	0.187***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Tertiary Education (Male)	-1.633***	0.057***	-0.773***	-1.681***	-0.245***	0.428***	-0.035**	0.282***
	(0.04)	(0.00)	(0.02)	(0.05)	(0.04)	(0.01)	(0.01)	(0.04)
Higher Education (Male)	-1.376***	0.046***	-0.962***	-0.628***	-0.450***	0.476***	-0.101***	0.408***
	(0.06)	(0.00)	(0.03)	(0.09)	(0.05)	(0.01)	(0.01)	(0.04)
Primary Education (Female)	0.965***	-0.047***	0.681***	0.467***	0.035	-0.357***	-0.130***	0.032
	(0.03)	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.06)
Secondary Education (Female)	0.999***	-0.015***	0.818***	0.473***	0.271***	-0.282***	-0.048***	-0.005
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.04)
Tertiary Education (Female)	0.970***	0.027***	0.826***	0.320***	0.471***	-0.149***	-0.001	0.192**
	(0.04)	(0.00)	(0.03)	(0.03)	(0.05)	(0.01)	(0.01)	(0.07)
Higher Education (Female)	0.821***	0.022***	0.506***	0.156***	-0.021	-0.025	-0.295***	0.252***
	(0.05)	(0.01)	(0.03)	(0.04)	(0.06)	(0.02)	(0.02)	(0.06)
Area (Rural=1)	-0.019	0.013***	0.180***	0.125***	0.221***	0.042***	0.052***	0.004
	(0.01)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Constant	6.051***	6.079***	6.463***	4.556***	3.698***	4.678***	7.371***	4.639***
	(0.12)	(0.01)	(0.08)	(0.12)	(0.26)	(0.04)	(0.04)	(0.17)
R2	0.523	0.219	0.467	0.417	0.522	0.436	0.340	0.320
DF	18739.000	22630.000	20871.000	10931.000	5978.000	20130.000	15760.000	4981.000
BIC	48199.348	-34763.243	40478.580	23010.704	11136.240	13409.380	5013.636	8915.321

<sup>a</sup> The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2010 Turkish Household Budget Survey by Turkish Statistical Institute

Table 19: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2011)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure)*	-0.125*** (0.01)	-0.037*** (0.00)	-0.233*** (0.01)	-0.054*** (0.00)	-0.090*** (0.01)	-0.080*** (0.00)	-0.045*** (0.00)	-0.050*** (0.00)
ln (Income)	-0.041*** (0.01)	-0.009*** (0.00)	-0.097*** (0.01)	-0.036*** (0.01)	-0.061*** (0.01)	0.021*** (0.00)	-0.043*** (0.00)	0.068*** (0.01)
ln (OECD Equivalence Scale HH Size)	0.024 (0.03)	-0.010** (0.00)	0.033 (0.02)	0.008 (0.03)	-0.011 (0.05)	-0.052*** (0.01)	0.007 (0.01)	0.201*** (0.04)
Rate Children (N. of children/N. of Adult)	0.168*** (0.05)	-0.004 (0.00)	0.109*** (0.03)	0.039 (0.04)	0.032 (0.06)	-0.009 (0.01)	0.004 (0.02)	-0.156** (0.06)
Ln (Age) (15-24)	-0.402*** (0.03)	-0.088*** (0.00)	-0.472*** (0.02)	-0.275*** (0.03)	2.402*** (0.12)	0.291*** (0.01)	-0.564*** (0.01)	0.372*** (0.06)
Ln (Age) (25-34)	-0.338*** (0.03)	-0.088*** (0.00)	-0.615*** (0.02)	-0.227*** (0.03)	1.839*** (0.12)	0.261*** (0.01)	-0.589*** (0.01)	1.028*** (0.05)
Ln (Age) (35-44)	-0.313*** (0.03)	-0.077*** (0.00)	-0.551*** (0.02)	-0.067** (0.03)	1.223*** (0.12)	0.226*** (0.01)	-0.495*** (0.01)	1.022*** (0.05)
Ln (Age) (45-54)	-0.252*** (0.03)	-0.058*** (0.00)	-0.363*** (0.02)	-0.129*** (0.03)	1.245*** (0.12)	0.167*** (0.01)	-0.335*** (0.01)	1.000*** (0.05)
Ln (Age) (55-64)	-0.075** (0.03)	-0.024*** (0.00)	-0.161*** (0.02)	-0.195*** (0.03)	0.913*** (0.12)	0.105*** (0.01)	-0.148*** (0.01)	0.876*** (0.06)
Married without children	-0.085*** (0.03)	0.013*** (0.00)	-0.037* (0.02)	-0.053* (0.03)	-0.019 (0.06)	0.017 (0.01)	0.010 (0.01)	0.045 (0.04)
Married with children	1.717*** (0.04)	-0.032*** (0.00)	0.963*** (0.03)	1.437*** (0.04)	0.434*** (0.08)	-0.435*** (0.01)	-0.057*** (0.01)	0.076 (0.06)
Single persons without children	-0.183*** (0.05)	0.018*** (0.01)	-0.053 (0.03)	-0.041 (0.05)	0.024 (0.08)	0.040* (0.02)	0.034* (0.02)	0.107 (0.07)
Single persons with children	0.123*** (0.03)	0.003 (0.00)	0.088*** (0.02)	0.140*** (0.03)	0.007 (0.06)	-0.020* (0.01)	-0.015 (0.01)	-0.017 (0.04)
Primary Education (Male)	-1.076*** (0.04)	-0.025*** (0.00)	-0.579*** (0.02)	-0.605*** (0.05)	-0.599*** (0.09)	0.121*** (0.01)	-0.039** (0.01)	0.344*** (0.06)
Secondary Education (Male)	-1.454*** (0.02)	0.007** (0.00)	-0.761*** (0.02)	-1.559*** (0.03)	-0.548*** (0.04)	0.306*** (0.01)	-0.016 (0.01)	0.217*** (0.03)
Tertiary Education (Male)	-1.876*** (0.04)	0.044*** (0.00)	-0.928*** (0.02)	-1.457*** (0.05)	-0.191*** (0.04)	0.401*** (0.01)	0.027** (0.01)	0.285*** (0.04)
Higher Education (Male)	-1.489*** (0.06)	0.039*** (0.00)	-1.010*** (0.03)	-0.994*** (0.07)	-0.380*** (0.05)	0.447*** (0.01)	-0.064*** (0.01)	0.439*** (0.04)
Primary Education (Female)	0.849*** (0.03)	-0.052*** (0.00)	0.566*** (0.02)	0.450*** (0.02)	0.021 (0.05)	-0.396*** (0.01)	-0.077** (0.01)	0.024 (0.06)
Secondary Education (Female)	0.942*** (0.02)	-0.023*** (0.00)	0.734*** (0.02)	0.464*** (0.02)	0.287*** (0.03)	-0.330*** (0.01)	0.005 (0.01)	0.031 (0.04)
Tertiary Education (Female)	0.950*** (0.03)	0.020*** (0.00)	0.747*** (0.02)	0.369*** (0.03)	0.518*** (0.04)	-0.214*** (0.01)	0.052*** (0.01)	0.114 (0.06)
Higher Education (Female)	0.771*** (0.04)	-0.002 (0.00)	0.517*** (0.03)	0.145*** (0.04)	0.045 (0.05)	-0.113*** (0.01)	-0.244*** (0.01)	0.343*** (0.05)
Area (Rural=1)	-0.030* (0.01)	0.025*** (0.00)	0.195*** (0.01)	-0.014 (0.01)	0.218*** (0.02)	0.019*** (0.00)	0.057*** (0.00)	0.022 (0.02)
Constant	6.192*** (0.10)	6.191*** (0.01)	6.801*** (0.07)	4.506*** (0.09)	3.468*** (0.18)	5.005*** (0.03)	7.323*** (0.03)	4.510*** (0.13)
R2	0.533	0.256	0.499	0.439	0.531	0.499	0.373	0.347
DF	19602.000	23229.000	21669.000	11349.000	5980.000	21023.000	16127.000	5215.000
BIC	49843.895	-40679.185	40287.322	22109.606	10803.750	7605.381	3168.030	9009.839

\*The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2011 Turkish Household Budget Survey by Turkish Statistical Institute

Table 20: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2012)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.111***	-0.031***	-0.255***	-0.042***	-0.091***	-0.096***	-0.041***	-0.062***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
ln (Income)	-0.019**	0.002*	-0.031***	-0.012	-0.016*	0.014***	-0.000	0.036***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
ln (OECD Equivalence Scale HH Size)	0.023	-0.005**	0.041***	-0.030*	-0.003	-0.047***	0.020***	-0.029
	(0.02)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)	(0.02)
Rate Children (N. of children/N. of Adult)	0.077	0.002	0.025	0.014	0.100*	0.115***	-0.050***	0.145*
	(0.04)	(0.00)	(0.03)	(0.04)	(0.04)	(0.01)	(0.01)	(0.06)
Ln (Age) (15-24)	-0.390***	-0.088***	-0.413***	-0.326***	2.481***	0.309***	-0.527***	1.415***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.10)	(0.01)	(0.01)	(0.09)
Ln (Age) (25-34)	-0.323***	-0.092***	-0.613***	-0.101***	1.972***	0.266***	-0.545***	2.040***
	(0.02)	(0.00)	(0.02)	(0.03)	(0.10)	(0.01)	(0.01)	(0.08)
Ln (Age) (35-44)	-0.180***	-0.076***	-0.539***	-0.007	1.550***	0.218***	-0.445***	2.031***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.10)	(0.01)	(0.01)	(0.08)
Ln (Age) (45-54)	-0.217***	-0.053***	-0.312***	-0.073**	1.211***	0.157***	-0.286***	1.978***
	(0.02)	(0.00)	(0.02)	(0.03)	(0.10)	(0.01)	(0.01)	(0.09)
Ln (Age) (55-64)	-0.140***	-0.029***	-0.112***	-0.191***	0.820***	0.107***	-0.113***	1.919***
	(0.02)	(0.00)	(0.02)	(0.03)	(0.11)	(0.01)	(0.01)	(0.09)
Married without children	-0.103***	0.009**	-0.055***	-0.025	-0.026	0.017*	0.009	0.003
	(0.02)	(0.00)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)	(0.04)
Married with children	1.565***	-0.035***	0.890***	1.391***	0.532***	-0.436***	-0.048***	0.023
	(0.03)	(0.00)	(0.02)	(0.04)	(0.05)	(0.01)	(0.01)	(0.06)
Single persons without children	-0.077	0.007	-0.051	-0.014	-0.028	-0.018	0.010	-0.133
	(0.04)	(0.00)	(0.03)	(0.04)	(0.05)	(0.02)	(0.01)	(0.07)
Single persons with children	0.088**	-0.001	0.047*	0.171***	0.018	-0.008	-0.032**	0.041
	(0.03)	(0.00)	(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.05)
Primary Education (Male)	-0.957***	-0.029***	-0.390***	-0.630***	-0.634***	0.105***	-0.017	0.381***
	(0.03)	(0.00)	(0.02)	(0.05)	(0.07)	(0.01)	(0.01)	(0.08)
Secondary Education (Male)	-1.444***	0.011***	-0.699***	-1.570***	-0.493***	0.328***	-0.007	0.144***
	(0.02)	(0.00)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.04)
Tertiary Education (Male)	-1.899***	0.028***	-0.941***	-1.434***	-0.171***	0.398***	0.032***	0.303***
	(0.04)	(0.00)	(0.02)	(0.05)	(0.03)	(0.01)	(0.01)	(0.04)
Higher Education (Male)	-1.508***	0.038***	-1.254***	-1.028***	-0.295***	0.456***	-0.016	0.331***
	(0.05)	(0.00)	(0.02)	(0.07)	(0.03)	(0.01)	(0.01)	(0.04)
Primary Education (Female)	0.793***	-0.055***	0.584***	0.442***	0.033	-0.391***	-0.059***	0.217
	(0.03)	(0.00)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)	(0.15)
Secondary Education (Female)	0.860***	-0.033***	0.712***	0.400***	0.281***	-0.312***	-0.011	0.155**
	(0.02)	(0.00)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.05)
Tertiary Education (Female)	0.855***	0.011**	0.731***	0.246***	0.450***	-0.178***	-0.001	-0.217***
	(0.03)	(0.00)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.06)
Higher Education (Female)	0.709***	-0.005	0.559***	0.051	0.016	-0.064***	-0.222***	0.191***
	(0.04)	(0.00)	(0.03)	(0.03)	(0.04)	(0.01)	(0.01)	(0.05)
Area (Rural=1)	-0.065***	0.018***	0.097***	-0.013	0.107***	0.084***	0.009*	0.392***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.02)
Constant	6.098***	6.205***	6.538***	4.395***	3.270***	5.200***	7.066***	3.443***
	(0.08)	(0.01)	(0.06)	(0.06)	(0.13)	(0.02)	(0.02)	(0.14)
R2	0.520	0.208	0.502	0.407	0.599	0.469	0.372	0.333
DF	21707.000	26059.000	24713.000	12645.000	7877.000	24336.000	18285.000	5340.000
BIC	54388.125	-45036.054	47016.339	24670.435	11853.759	12894.212	915.744	10634.754

<sup>a</sup>The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2012 Turkish Household Budget Survey by Turkish Statistical Institute

Table 21: Time Use Demand Elasticity of Market Commodity Versus Time Used in Domestic Production (2013)

	ln (Time Food)	ln (Time H&Pc)	ln (Time Housing)	ln (Time Clothing)	ln (Time Education)	ln (Time Transport)	ln (Time Leisure)	ln (Time Others)
ln (Monetary Expenditure) <sup>a</sup>	-0.110*** (0.01)	-0.050*** (0.00)	-0.258*** (0.01)	-0.042*** (0.00)	-0.092*** (0.00)	-0.100*** (0.00)	-0.043*** (0.00)	-0.053*** (0.01)
ln (Income)	-0.072*** (0.01)	-0.011*** (0.00)	-0.110*** (0.01)	-0.084*** (0.01)	-0.088*** (0.01)	0.030*** (0.00)	-0.043*** (0.00)	0.042** (0.02)
ln (OECD Equivalence Scale HH Size)	0.052 (0.03)	-0.013** (0.00)	0.117** (0.02)	-0.015 (0.03)	0.037 (0.04)	-0.111** (0.01)	0.005 (0.01)	0.042 (0.05)
Rate Children (N. of children/N. of Adult)	0.048 (0.04)	0.020*** (0.01)	0.070** (0.03)	0.032 (0.04)	0.019 (0.04)	0.099*** (0.01)	0.025 (0.01)	-0.017 (0.06)
Ln (Age) (15-24)	-0.375*** (0.03)	-0.087*** (0.00)	-0.447*** (0.02)	-0.333*** (0.03)	2.321*** (0.12)	0.298*** (0.01)	-0.537*** (0.01)	1.560*** (0.08)
Ln (Age) (25-34)	-0.331*** (0.02)	-0.083*** (0.00)	-0.617*** (0.02)	-0.074** (0.02)	1.852*** (0.12)	0.264*** (0.01)	-0.550*** (0.01)	2.151*** (0.08)
Ln (Age) (35-44)	-0.176*** (0.02)	-0.069*** (0.00)	-0.509*** (0.02)	0.000 (0.03)	1.408*** (0.12)	0.204*** (0.01)	-0.448*** (0.01)	2.120*** (0.08)
Ln (Age) (45-54)	-0.223*** (0.02)	-0.054*** (0.00)	-0.323*** (0.02)	-0.056* (0.03)	1.095*** (0.12)	0.158*** (0.01)	-0.312*** (0.01)	2.069*** (0.08)
Ln (Age) (55-64)	-0.104*** (0.02)	-0.024*** (0.00)	-0.101*** (0.02)	-0.174*** (0.03)	0.678*** (0.12)	0.097*** (0.01)	-0.120*** (0.01)	1.942*** (0.09)
Married without children	-0.077*** (0.02)	0.008** (0.00)	-0.054*** (0.01)	-0.075*** (0.02)	-0.064 (0.03)	0.020** (0.01)	0.022** (0.01)	0.068 (0.04)
Married with children	1.560*** (0.03)	-0.039*** (0.00)	0.873*** (0.02)	1.311*** (0.04)	0.369*** (0.05)	-0.433*** (0.01)	-0.073*** (0.01)	0.079 (0.07)
Single persons without children	-0.173*** (0.04)	0.005 (0.01)	-0.025 (0.03)	-0.023 (0.04)	-0.088 (0.05)	-0.014 (0.02)	0.007 (0.02)	0.215** (0.07)
Single persons with children	0.130*** (0.03)	0.007* (0.00)	0.049** (0.02)	0.141*** (0.03)	-0.066 (0.04)	-0.017 (0.01)	0.002 (0.01)	0.068 (0.05)
Primary Education (Male)	-0.979*** (0.03)	-0.048*** (0.00)	-0.465*** (0.02)	-0.652*** (0.05)	-0.703*** (0.08)	0.092*** (0.01)	-0.029* (0.01)	0.427*** (0.08)
Secondary Education (Male)	-1.433*** (0.02)	0.013*** (0.00)	-0.713*** (0.02)	-1.525*** (0.03)	-0.534*** (0.03)	0.316*** (0.01)	-0.000 (0.01)	0.168*** (0.04)
Tertiary Education (Male)	-1.794*** (0.04)	0.040*** (0.00)	-0.943*** (0.02)	-1.541*** (0.05)	-0.196*** (0.03)	0.390*** (0.01)	0.049*** (0.01)	0.286*** (0.04)
Higher Education (Male)	-1.490*** (0.05)	0.060*** (0.00)	-1.209*** (0.02)	-0.835*** (0.06)	-0.231*** (0.03)	0.447*** (0.01)	0.031** (0.01)	0.296*** (0.04)
Primary Education (Female)	0.772*** (0.03)	-0.061*** (0.00)	0.532*** (0.02)	0.395*** (0.02)	-0.046 (0.04)	-0.407*** (0.01)	-0.066*** (0.01)	0.221 (0.16)
Secondary Education (Female)	0.853*** (0.02)	-0.029*** (0.00)	0.692*** (0.02)	0.374*** (0.02)	0.221*** (0.03)	-0.316*** (0.01)	-0.006 (0.01)	0.140** (0.05)
Tertiary Education (Female)	0.872*** (0.03)	0.021*** (0.00)	0.750*** (0.02)	0.273*** (0.03)	0.435*** (0.04)	-0.182*** (0.01)	0.059*** (0.01)	-0.181** (0.07)
Higher Education (Female)	0.751*** (0.04)	0.002 (0.00)	0.595*** (0.03)	0.073* (0.03)	0.087* (0.04)	-0.113*** (0.01)	-0.196*** (0.01)	0.131** (0.05)
Area (Rural=1)	-0.052*** (0.01)	0.035*** (0.00)	0.132*** (0.01)	0.007 (0.01)	0.103*** (0.02)	0.078*** (0.00)	0.009* (0.00)	0.418*** (0.02)
Constant	6.739*** (0.11)	6.470*** (0.01)	7.462*** (0.07)	5.177*** (0.10)	4.310*** (0.18)	5.126*** (0.04)	7.602*** (0.04)	3.085*** (0.19)
R2	0.513	0.268	0.517	0.410	0.573	0.469	0.371	0.328
DF	21901.000	26548.000	24825.000	12771.000	7507.000	24771.000	18550.000	5632.000
BIC	55151.252	-38881.908	45907.998	24638.337	12009.711	13459.638	2004.228	11253.397

<sup>a</sup> The parameters are estimated separately for each time use and consumption group

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: 2006 Turkish Time Use Survey and 2013 Turkish Household Budget Survey by Turkish Statistical Institute