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ABSTRACT:

The ability to measure the predictive power of consumer surveys is very important especially for central banks in order to have a forward-looking perspective about consumer tendencies and expenditures. Particularly, most studies have found that diffusion indices obtained from surveys are linked to aggregate GDP or consumer expenditures. Therefore, the performance of prediction can be assessed at an aggregate level via the diffusion indices. On the other hand, our paper, while restricting itself to the evaluation of Turkish data provided by Consumer Tendency Survey (CTS) for the period 2003-2012, differs from previous studies in looking at disaggregated measures of both consumers' opinion and household's expenditures. In particular, various demographic characteristics such as employment type, age and income of the people interviewed are considered in this paper. Moreover, as a reference series, different categories of consumption are used (services, food and non-food items) instead of more aggregate measures of economic activity (total consumption, GDP). First of all, the survey results are analyzed monthly and quarterly. The quarterly series, which shows less volatility compared with monthly series, are used in order to examine the leading/coincident relationships with the related reference series; then, we test the significance of these relationships. We also construct regression models. The disaggregated analysis confirms that the CTS-consumption relationship is stronger for different demographic categories of consumers and some specific groups of expenditures than the aggregated categories of consumers.

Key Words: Consumers, Consumption, Time series, Demographics

JEL classification: N3, E2, C1, J11

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1. INTRODUCTION:

Consumer behavior plays an important role in providing economic decision-makers and economic forecasters with necessary information about future expectations. Optimistic consumer confidence may cause desire for making large expenses and increase the tendency for borrowing, while pessimism may cause consumers to reduce their expenditures, to review their financial situations.

Consumer surveys provide regular assessments of consumer attitudes and expectations and are used to evaluate economic trends and prospects. The surveys are designed to explore why changes in consumer expectations occur and how these changes influence consumer spending and saving decisions. They also provide the necessary data for the measurement of the consumer confidence (Kershoff, 2000).

There are lots of studies concerning the relationship between diffusion indices obtained from consumer survey with consumer expenditures or total GDP. Fuhrer (1988) found evidence about the survey data that contains useful information not present in the standard macroeconomic data base. He stated that the question on unemployment situation over twelve months seems to be rather essential in explaining forecast errors in real consumption. Carroll et al. (1994) presented the result that lagged consumer sentiment has explanatory power for current changes in household spending. Matsusaka and Sbordone (1995) investigated the link between consumer confidence and economic fluctuations and found that consumer sentiment Granger causes GDP. Golinelli and Parigi (2004) analyzed the consumer sentiment indices of different countries in anticipating the evolution of GDP via different statistical techniques such as Granger non-causality tests and cointegrated VAR. They discovered that consumer sentiment indices have the leading property for GDP. Gelper et al. (2007) also found strong long-run Granger causality relation between consumer sentiment index and consumption.

Kwan and Cotsomitis (2004) examined the predictive ability of various measures of consumer confidence and considered four categories of consumption; total consumption expenditures, durable goods, nondurable goods and services. Levanon (2006) observed questions that construct confidence index with variables related to business decisions like investment in equipment, employment and unemployment as well as GDP. He found that questions of consumer confidence index are more related to business conditions than to consumption. Dudek (2008) examined all consumer survey questions for detecting their predictive ability.

Leproux et al (2004) found the relationship between diffusion indices and macroeconomic variables weak and stated that this can be caused mostly because of the aggregation. Therefore, they assessed the performance of prediction at a disaggregated level.

The State Institute of Statistics (SIS) and the Central Bank of Turkey (CBRT) have jointly launched a study within the framework of "Consumer Survey" Protocol in 2003. The Consumer Tendency Survey (CTS) has been constructed in order to find out consumer tendencies and expectations for general economic course, job opportunities, personal financial standing and market developments in order to assess their expenditure behavior as well as their expectations, and therefore deciding monthly consumer tendencies in the short-run.

The main aim of the paper is an investigation whether CTS data can be useful for short-term forecasting of real private consumption expenditures in Turkey at a disaggregated level. An investigation of predictive relationship between CTS results and real private consumption has been done.

The study is composed of three sections. Introduction part highlights the importance of the expectations obtained from Consumer Surveys as leading indicators for the central banks. The studies on searching the relationship between macroeconomic variables and survey measures are

introduced. Then the aims of the study which are examining the variations of consumers' expectations across demographic groups and the relationship between realizations are presented in the introduction part. The detailed knowledge about the survey is given in the second section. The empirical evidence is given in the third section. Finally, the conclusion part gives the final results.

2. CONSUMER TENDENCY SURVEY:

Consumer Tendency Survey (CTS) has been carried out with the cooperation of Turkish Statistical Institute (TurkStat) and Central Bank of the Republic of Turkey since December 2003.

CTS aims to measure present situation assessments and future period expectations of consumers' on personal financial standing and general economic course and to determine consumers' expenditure and saving tendencies for near future.

Diffusion indices of every question of CTS are computed based on the responses to the monthly survey which aim to mirror the consumers' spending aims. These indices are compiled in accordance with the balance method of European Union (User Guide, 2003). The balance is calculated as the difference between the percentages of positive and negative responses and 100 is added to this difference, thus forming a separate diffusion index for each question. The index is evaluated between 0 and 200. If it is above 100, it reflects optimistic opinion of consumers whereas if it is below 100, it means pessimistic outlook. 100 refers to neutral opinion.

CTS started to be applied in accordance with the Joint Harmonized European Union Programme of Business and Consumer Surveys in 2012. CTS and the Consumer Confidence Index have been built-up according to the EU coverage in 2013. New harmonized survey covers households at the age of 16 and above in urban and rural areas of Turkey. The person is selected randomly by the data entry programme and the target area is the whole country. CTS is conducted on a monthly basis with an independent survey. The survey results are weighted by age and gender categories. Address Based Population Registration System is used as frame. A computer-based, face-to-face interview method is applied. The fieldwork period of the survey is the 1st-15th day of each month. The survey results concerning the reference month are published on the last week of the month as is in the National Data Release Calendar. The comparisons between old and new survey can be seen in Appendix A. Detailed information and survey questions can be found on the Turkish Statistical Institute's (Turkstat) web site http://www.turkstat.gov.tr. The questions of CTS conducted until 2013 are also given in Appendix B.

3. EMPIRICAL EVIDENCE:

First of all, all questions of CTS with respect to different categories are examined monthly. Due to the fact that monthly data exhibit volatile pattern, quarterly data are used for further analyses. CTS data for the period 2005Q1-2012Q4 are used. The first evaluation year of CTS, 2004, is skipped so as to have a consistent sample.

The main aim is to measure the differences of consumers' demographic characteristics and forecasting performances. Therefore, we calculate all the diffusion indices of survey at disaggregated level. The survey results are analyzed at disaggregated level according to the consumers' socioeconomic characteristics.

There are 3 categories of CTS such as age, employment type and income. In the employment type, there are 3 categories: Regular or casual employee, employer and self-employed. Age categories are examined in 4 groups such as 15-24, 25-34, 35-54 and 55+. The number of income levels is 5: 0-499 TRY, 500-999 TRY, 1000-2999 TRY, 3000-4999 TRY, 5000 TRY and more. The percentages of each category are given in Figure 1 (Current values in the figure are the arithmetic mean of the 12 months of 2012).

Figure 1: Percentages of Employment, Age and Income

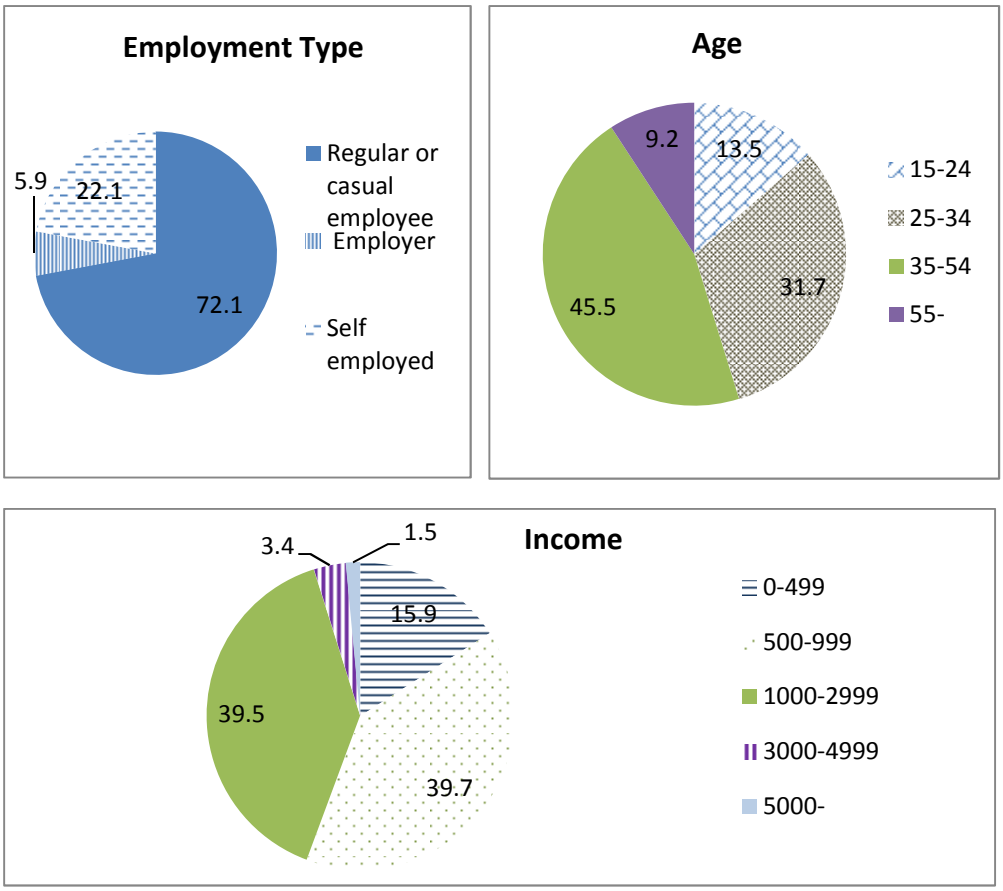


Table 1 and 2 indicate divergence across employment type and age groups respectively.

Table 1: Consumer Behavior Differences According to Employment Type

Questions	***Divergence***	***Explanation of Divergence***	
		More optimistic group	***More pessimistic group***
Q1	+	Groups 1 & 2	Group 3
Q2	+	Group 2	Groups 1 & 3
Q3	–		
Q4	–		
Q5	+	Group 2	Groups 1 & 3
Q6	+	Group 2	Groups 1 & 3
Q7	+	Group 2	Groups 1 & 3
Q8	+	Group 2 then Group 1	Group 3
Q9	+	Group 2 then Group 1	Group 3
Q10	+	Group 2 then Group 1	Group 3
Q11	+	Group 2	Group 1 & 3
Q12	+	Group 2 then Group 1	Group 3
Q13	+	Group 2	Groups 1 & 3
Q14	+	Group 2 then Group 1	Group 3
Q15	+	Groups 2 & 3	Group 1

Groups 1, 2 and 3 stand for "Regular or casual employee", "Employer" and "Self-employed" respectively.

When we investigate answers in line with the employment type of the consumers, the most optimistic group consists of employers and the self-employed consumers comprise most pessimistic group for many questions.

Table 2: Consumer Behavior Differences According to Different Age Groups

Questions	*Divergence*	*Explanation of Divergence*	
		More optimistic group	***More pessimistic group***
Q1	+	Groups 1 & 2	Groups 3 & 4
Q2	+	Groups 1 & 2	Groups 3 & 4
Q3	+	Group 4 then Groups 2 & 3	Group 1
Q4	+	Group 4 then Groups 2 & 3	Group 1
Q5	–		
Q6	–		
Q7	+	Groups 2 & 3 & 4	Group 1
Q8	+	Groups 1 & 2 & 3	Group 4
Q9	+	Group 2 then Groups 1 & 3	Group 4
Q10	+	Group 2 then Group 3	Groups 1 & 4
Q11	+	Groups 3 & 4	Groups 1 & 2
Q12	+	Groups 2 & 3 then Group 1	Group 4
Q13	+	Groups 2 & 3 & 4	Group 1
Q14	+	Group 2	Groups 1 & 3 & 4
Q15	+	Group 4	Groups 1 & 2 & 3

Groups 1, 2, 3 and 4 stand for "15-24", "25-34", "35-54" and "55+" respectively.

It can be observed that age category makes a difference in consumer behavior according to all survey questions except questions 5 and 6. In addition, consumers' expectations are examined for each question according to their different income levels and it is found that consumers who have high income are more optimistic than those of having low income (Owing to finding the same result for each question, divergence table for income levels is omitted).

Secondly, we think about different groups of consumers by combining the age categories and income levels in order to specify the different behavior of consumers who have low level income or high level income with respect to their ages. According to this mixture, we construct 4 groups given below:

- Income1&2 and Age2: Income Level: 0-999 TRY and Age group 25-34
- Income1&2 and Age3&4: Income Level: 0-999 TRY and Age group 35+
- Income3&4&5 and Age2: Income Level: 1000 TRY + and Age group 25-34
- Income3&4&5 and Age3&4: Income Level: 1000 TRY + and Age group 35+

The breakdown of demographics can be seen in Figures 2-7.

Figure 2: Assessment on spending money on semi-durable goods (next 3 months)

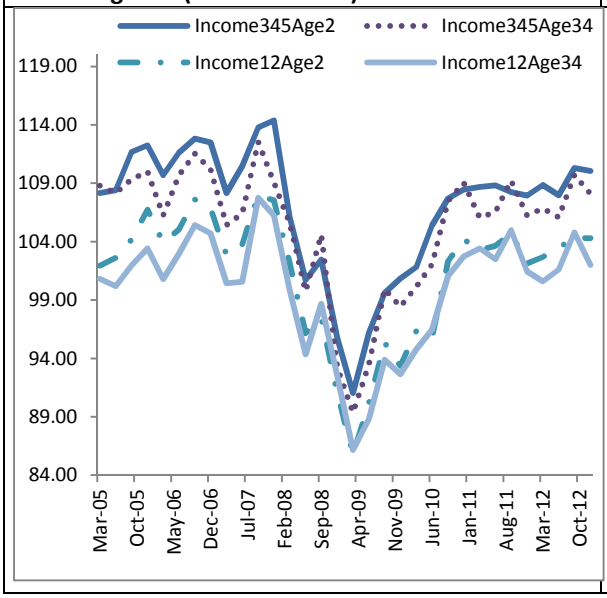
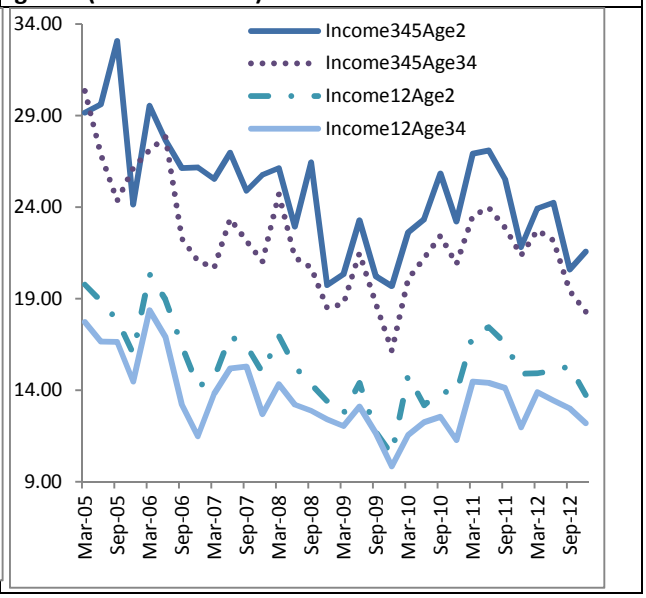


Figure 3: Probability of buying durable consumption goods (next 6 months)



It can be seen from Figure 2 that consumers who have high income level are more optimistic than those from low income group. Moreover, young people had higher indices than older people until 3rd quarter of 2008. As of this period, the expectations of the young and the old get closer to each other. Figure 3 states that high income earners have more positive attitudes than low income earners. Additionally, younger consumers have positive outlooks compared to old ones. The similar pattern can also be seen through Figures 4-7.

Figure 4: Probability of buying a car (next 6 months)

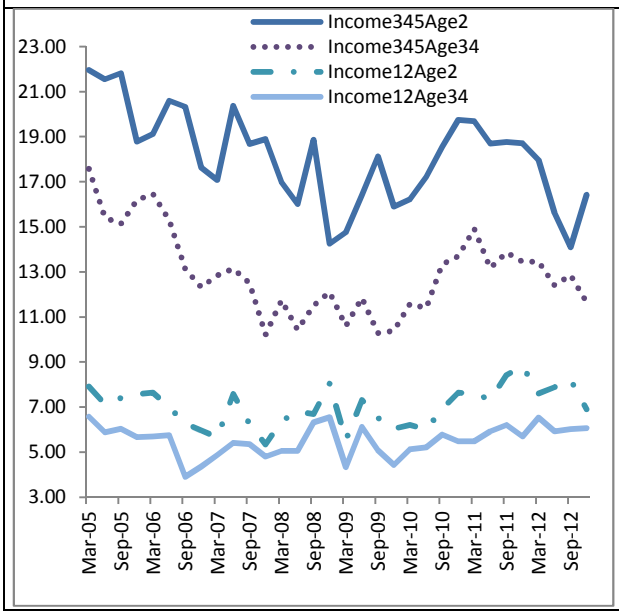


Figure 5: Probability of buying or building a home (next 12 months)

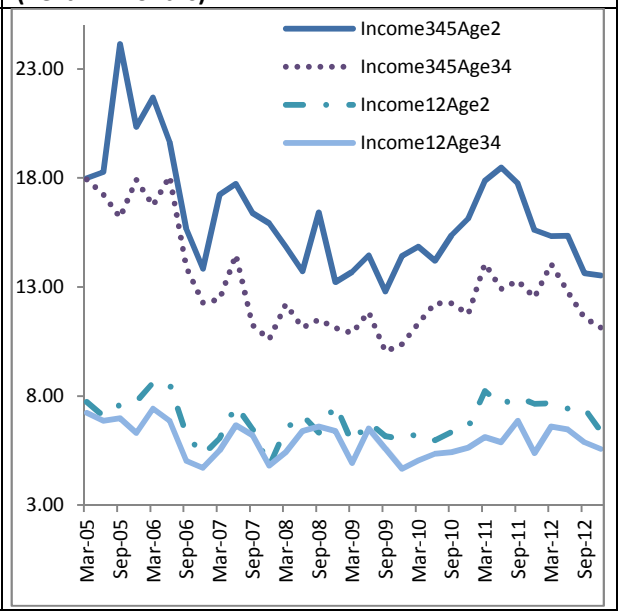


Figure 6: Probability of saving (next 6 months)

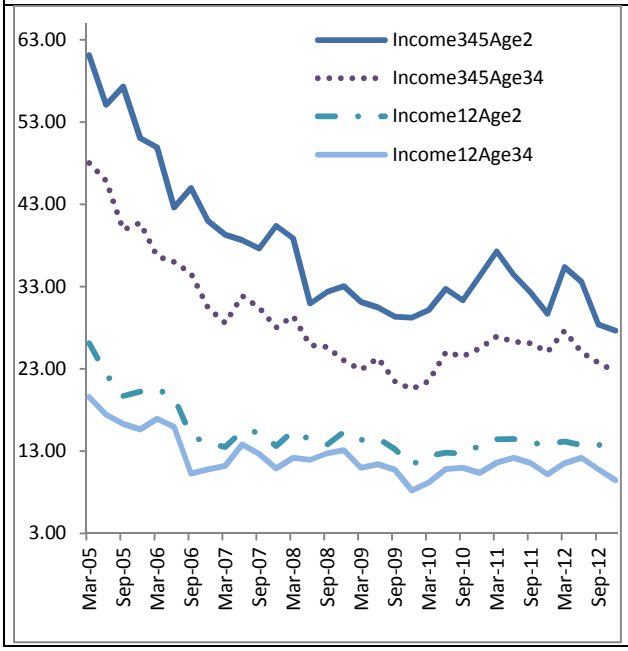
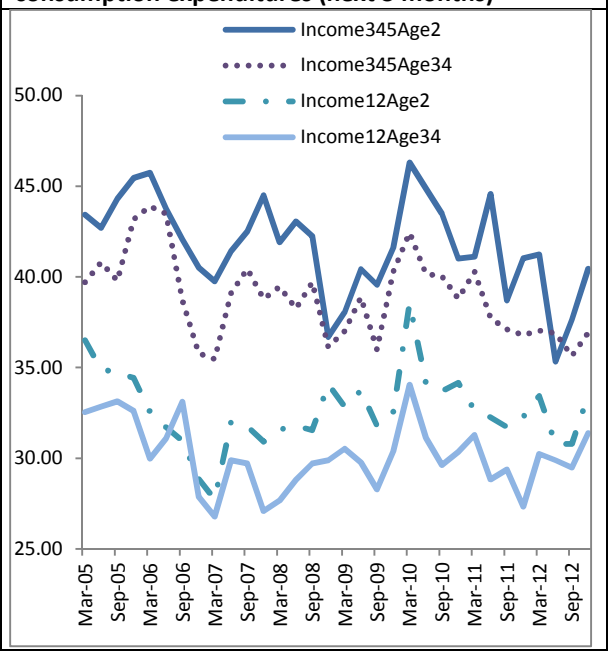


Figure 7: Probability of borrowing money to finance consumption expenditures (next 3 months)



Once the differences across the groups are inspected graphically, the differences in means are tested statistically. The equality of means is tested according to age groups for the question 6 (assessment on spending money on semi-durable goods over the next 3 months). It is found that different age groups have the same expectations for this question. This result is consistent with Table 2 which states that for question 6, there is no divergence according to different age groups.

The questions about spending money on semi-durable and durable goods, probability of buying a car, saving and borrowing money are analyzed with the corresponding realizations given in Table 3.

Table 3: Selected Questions of CTS and Related Realizations

Questions	***Realizations***
Q6: Assessment on spending money on semi-durable goods (next 3 months)	∗ Expenditures on Food and Beverages and tobacco, Clothing and Footwear ∗ Manufacturing of Consumer Goods ∗ Manufacturing of Non-Durable Consumer Goods
Q8: Probability of buying durable consumption goods (next 6 months)	∗ Expenditures on Furniture, houses appliances and home care services, Transportation, Communication & Entertainment and culture ∗ Manufacturing of Consumer Goods ∗ Manufacturing of Durable Consumer Goods ∗ Sales of white goods
Q9: Probability of buying a car (next 6 months)	∗ Manufacturing of Capital Goods ∗ Automobile Loans ∗ Total Automobile Sales ∗ Demand for Vehicle Loans (Bank Loans Tendency Survey)
Q10: Probability of buying or building a home (next 12 months)	∗ Housing Loans ∗ Demand for Housing Loans (Bank Loans Tendency Survey)
Q12: Probability of borrowing money to finance consumption expenditures (next 3 months)	∗ Consumer Loans ∗ Demand for Other Consumer Loans (Bank Loans Tendency Survey)
Q14: Probability of saving (next 6 months)	∗ Households' Deposits

Source: CBRT, TurkStat, Automotive Manufacturers Association, White Goods Manufacturers' Association of Turkey.

Expenditures of “food and beverages and tobacco, clothing and footwear”; “furniture, houses appliances and home care services, transportation, communication & entertainment and culture” are the expenditures on the GDP, at 1987 prices. Manufacturing of consumer goods are calculated according to Main Industrial Groupings (MIGS) classification by TurkStat.

The monthly data on automobile, housing and consumer loans (in thousand TRY) are gathered from the sectoral breakdown of deposit money banks’ loans from the Electronic Data Dissemination System (EDDS) of CBRT. Households’ Deposits (total of Households (TRY) and Households (FX)) which are disseminated in thousand TRY are also collected from the sectoral breakdown of deposit money banks’ deposits via the EDDS. After converting monthly data into quarterly series, GDP deflator is used in order to obtain real values.

Demand for vehicle, housing and other consumer loans are taken from Bank Loans Tendency Survey (BLTS) of CBRT. BLTS is a quarterly survey in order to monitor and assess the tendencies of bank loans that are important in the financing the economic activity. The survey aims to detect the realized and expected changes in the credit standards for approving loans and the non-interest rate conditions and terms applied to enterprises and households as well as the changes in the factors which potentially affect the standards. It also provides information about the tendencies of the demand for loans. It covers the top 15 banks which have the largest shares in the loan market and provide 80 percent of the total loans in the sector. These banks consist of one public, nine private and five foreign banks (http://www.tcmb.gov.tr/ucaylik/bankakrean/MethodologicalExplanations.pdf). The questions on “demand for loans and credit lines over the past three months” are analyzed for this study. The formula for the realized net percentage change value for each question can be given as:

(Increased Somewhat+Increased Considerably)-(Decreased Somewhat+Decreased Considerably)+100

Data on total automobile and white goods sales are found via Automotive Manufacturers Association and White Goods Manufacturers’ Association of Turkey respectively.

The realizations are calculated in two ways. One approach is seasonally adjusting series and calculating quarter to quarter percentage changes by using these new data. The second approach is calculating the year to year percentage changes. We have tried both approaches and have found that higher correlations can be attained with questions and realizations from the latter approach. Afterwards, we calculated cross correlations alike the study of Snyman and Martin (2006).

The cross correlations between the two series x and y are given as:

$$r_{xy}(k) = \frac{c_{xy}(k)}{\sqrt{c_{xx}(0)c_{yy}(0)}}, \qquad \text{where } k = 0, \pm 1, \pm 2, \ldots$$

and,

$$c_{xy}(k) = \begin{cases} \sum_{t=1}^{T-k} ((x_t - \bar{x})(y_{t+k} - \bar{y}))/T \quad , \quad k = 0, 1, 2, \ldots \\ \sum_{t=1}^{T+k} ((x_{t-k} - \bar{x})(y_t - \bar{y}))/T \quad , \quad k = 0, -1, -2, \ldots \end{cases}$$

T is the series length, k is the lag.
The cross-correlations with respect to the leading-lagging relationships are given in Tables 4-9.

Table 4: Question on Assessment on spending money on semi-durable goods (next 3 months) and Realizations

	Food and Beverages and tobacco, Clothing and Footwear Expenditures		Manufacturing of Non-Durable Consumer Goods		Manufacturing of Consumer Goods	
Groups	**Lag**	**Correlation**	**Lag**	**Correlation**	**Lag**	**Correlation**
Income1&2 and Age2	0	0.477*	0	0.529*	0	0.533*
Income1&2 and Age3&4	0	0.493*	0	0.512*	0	0.515*
Income3&4&5 and Age2	0	0.468*	0	0.602*	0	0.588*
Income3&4&5 and Age3&4	0	0.470*	0	0.555*	0	0.562*
Total	0	0.483*	0	0.545*	0	0.544*

* Correlation coefficient is significant at % 95 confidence level.

Question on Assessment on spending money on semi-durable goods (next 3 months) and Realizations are analyzed. It can be observed that the highest correlation belongs to the "Income3&4&5 and Age2" group (young people with high income) when the related realization is chosen as Manufacturing of Non-Durable Consumer Goods (Table 4).

Table 5-a: Question on Probability of buying durable consumption goods (next 6 months) and Realizations

	Furniture, houses appliances and home care services, Transportation, Communication Expenditures		Furniture, houses appliances and home care services, Transportation, Communication & Entertainment and culture Expenditures	
Groups	**Lag**	**Correlation**	**Lag**	**Correlation**
Income1&2 and Age2	0	0.368*	0	0.361*
Income1&2 and Age3&4	0	0.255	0	0.238
Income3&4&5 and Age2	0	0.398*	0	0.390*
Income3&4&5 and Age3&4	0	0.415*	0	0.394*
Total	0	0.335*	0	0.348*

* Correlation coefficient is significant at % 95 confidence level.

Table 5-b: Question on Probability of buying durable consumption goods (next 6 months) and Realizations

	Manufacturing of Durable Consumer Goods		Manufacturing of Consumer Goods		Sales of white goods	
Groups	**Lag**	**Correlation**	**Lag**	**Correlation**	**Lag**	**Correlation**
Income1&2 and Age2	0	0.280	0	0.371*	0	0.264
Income1&2 and Age3&4	0	0.124	0	0.251	0	0.067
Income3&4&5 and Age2	0	0.360*	0	0.385*	0	0.165
Income3&4&5 and Age3&4	0	0.372*	0	0.389*	0	0.173
Total	0	0.300*	0	0.422*	0	0.308*

* Correlation coefficient is significant at % 95 confidence level.

Table 5 states that for the question of probability of buying durable consumption goods over next 6 months, the highest correlation group consists of the "Income3&4&5 and Age3&4" group (people who are in the age group of 35 and higher among the earners of high income) when the related realization is chosen as Furniture, houses appliances and home care services, Transportation, Communication Expenditures. When the manufacturing of consumer goods is used as realized series, there is no need for disaggregation since the total diffusion index has highest correlation, numerically 0.422.

Table 6: Question on Probability of buying a car (next 6 months) and Realizations

	Manufacturing of Capital Goods		Automobile Loans		Total Automobile Sales		Demand for Vehicle Loans (Bank Loans Tendency Survey)	
Groups	**Lag**	**Corr.**	**Lag**	**Corr.**	**Lag**	**Corr.**	**Lag**	**Corr.**
Income1&2 and Age2	10	0.151	0	0.609*	8	0.113	4	0.243
Income1&2 and Age3&4	10	0.415*	0	0.430*	9	0.313	9	0.246
Income3&4&5 and Age2	0	0.488*	2	0.458*	0	0.107	0	0.167
Income3&4&5 and Age3&4	0	0.357*	0	0.751*	16	0.063	0	0.249
Total	10	0.223	0	0.777*	0	0.224	5	0.341*

* Correlation coefficient is significant at % 95 confidence level.

Question on probability of buying a car over next 6 months are examined in Table 6. The maximum correlation is found for the group of "Income3&4&5 and Age2" group (people who are in the age group of 25-34 among the earners of high income) when the related realization is chosen as manufacturing of capital goods. There is no necessity to disaggregate as the total diffusion index has highest correlation when the Automobile Loans is taken for realization.

Table 7: Question on Probability of buying or building a home (next 12 months) and Realizations

	Housing Loans		Demand for Housing Loans (Bank Loans Tendency Survey)	
Groups	**Lag**	**Correlation**	**Lag**	**Correlation**
Income1&2 and Age2	8	0.219	4	0.165
Income1&2 and Age3&4	9	0.259	8	0.192
Income3&4&5 and Age2	0	0.306*	0	0.287
Income3&4&5 and Age3&4	0	0.156	0	0.180
Total	9	0.237	5	0.195

* Correlation coefficient is significant at % 95 confidence level.

Question on Probability of buying or building a home next 12 months are analyzed for the leading relationship with housing loans. It can be seen from Table 7 that the highest correlation belongs to the "Income3&4&5 and Age2" group (young people with high income). When the related realization is chosen as demand for housing loans, each cross-correlation comes about to be insignificant.

Table 8: Question on Probability of borrowing money to finance consumption expenditures (next 3 months) and Realizations

	Consumer Loans		Demand for Other Consumer Loans (Bank Loans Tendency Survey)	
Groups	**Lag**	**Correlation**	**Lag**	**Correlation**
Income1&2 and Age2	3	0.352*	8	0.351*
Income1&2 and Age3&4	2	0.518*	8	0.299
Income3&4&5 and Age2	0	0.591*	0	0.480*
Income3&4&5 and Age3&4	0	0.646*	0	0.436*
Total	2	0.201	8	0.319

* Correlation coefficient is significant at % 95 confidence level.

Table 8 analyzes question on Probability of borrowing money next 3 months for the leading relationship with consumer loans. The highest correlation can be found in the group of older

consumers with high income (Income3&4&5 and Age3&4") when the realization is selected as consumer loans.

Table 9: Question on Probability of saving (next 6 months) and Realizations

	Households' Deposits	
Groups	**Lag**	**Correlation**
Income1&2 and Age2	5	0.685*
Income1&2 and Age3&4	3	0.676*
Income3&4&5 and Age2	3	0.716*
Income3&4&5 and Age3&4	3	0.694*
Total	5	0.572*

* Correlation coefficient is significant at % 95 confidence level.

Question on Probability of saving money over next 6 months are analyzed for the leading relationship with households' deposits. It can be seen Table above that the highest correlation belongs to the "Income3&4&5 and Age2" group (young people with high income).

Regression models are also constructed by taking realizations as dependent variable and the diffusion indices of groups belonging to the highest correlation as independent variable.

Predictive ability of consumer expectations for spending can be measured through the following regression equation:

$$\Delta \ln(C_t) = \propto_0 + \sum_{i=1}^{n} \beta_i S_{t-i} + \gamma Z_{t-1} + \varepsilon_t$$

where C_t stands for real consumption spending, S_t is the measure of consumer expectations and Z_t is a vector of control variables (Caroll et al., 1994).

Primarily for this study, base regression models that only contain lags of the dependent variable are considered. The 3rd column of Table 10 gives results of the base regression. Then, the contemporaneous and lagged values of CTS measures are added as explanatory variables to each regression model. The results reported in the last column corresponds to total diffusion indices of each question.

Table 10: Comparisons of Regression Models[2]

		Baseline	*Baseline equation augmented by*	
Dependent Variable				
			Q6_Income345Age2	***Q6_Total***
Manufacturing of Non-Durable Consumer Goods	*Adjusted R-square*	0.384	0.490	0.480
	P-value	0.002	0.020*	0.027*
	RMSE	4.075	3.635	3.670
	MAE	3.098	2.615	2.782
	Theil Inequality Coef.	0.383	0.330	0.334
	Included obs.	27	27	27
			Q8_Income345Age34	***Q8_Total***
Furniture, houses appliances and home care services, Transportation, Communication Expenditures	*Adjusted R-square*	0.371	0.580	0.576
	P-value	0.000	0.002*	0.015*
	RMSE	8.042	5.948	5.974
	MAE	6.503	4.624	4.427
	Theil Inequality Coef.	0.409	0.311	0.313
	Included obs.	31	28	28
			Q9_Income345Age2	***Q9_Total***
Manufacturing of Capital Goods	*Adjusted R-square*	0.599	0.651	0.606
	P-value	0.000	0.036*	0.076**
	RMSE	11.859	10.847	11.526
	MAE	7.805	7.479	8.145
	Theil Inequality Coef.	0.328	0.294	0.317
	Included obs.	27	27	27
			Q10_Income345Age2	***Q10_Total***
Housing Loans	*Adjusted R-square*	0.569	0.727	0.657
	P-value	0.000	0.001*	0.099**
	RMSE	7.086	5.513	6.176
	MAE	5.964	4.050	4.738
	Theil Inequality Coef.	0.184	0.141	0.159
	Included obs.	24	24	24
			Q12_Income345Age34	***Q12_Total***
Consumer Loans	*Adjusted R-square*	0.848	0.911	0.899
	P-value	0.000	0.076**	0.989
	RMSE	11.410	6.929	7.388
	MAE	8.308	5.557	6.398
	Theil Inequality Coef.	0.130	0.096	0.102
	Included obs.	31	28	28
			Q14_Income345Age2	***Q14_Total***
Households' Deposits	*Adjusted R-square*	0.497	0.641	0.578
	P-value	0.000	0.002*	0.029*
	RMSE	3.818	3.258	3.403
	MAE	2.867	2.458	2.910
	Theil Inequality Coef.	0.193	0.161	0.178
	Included obs.	31	29	27

[2] CTS questions are taken as independent variables in regression equations and denoted as "Q". The table reports the P-values for the joint significance of the contemporaneous and lagged values of the survey measures. Detailed information about RMSE, MAE and Theil Inequality Coef. are given in Appendix C.
* significant at 5 % level, ** significant at 10 % level

The results in Table 10 indicate that most of the CTS measures are significant at 5 % level in explaining the related realizations. The selected groups' diffusion index on the probability of borrowing money to finance consumption expenditures is found to be significant at 10 % level in the regression model where consumer loan is taken as dependent variable. The adjusted R-square values and error statistics indicate that the models with diffusion indices of disaggregated groups outperform the models with the total diffusion indices.

4. CONCLUSION

The aim of this study is to examine consumers' expectations and define the categories of people that differ about macroeconomic outlook. We examine whether there exist similarities or differences in the disaggregated consumer groups for their macroeconomic expectations.

In this study, the Consumer Tendency Survey (CTS) which has been conducted monthly is introduced in a detailed way and the qualitative questions of the CTS are analyzed for the period 2003-2012. This study indicates the evaluation of the consumer survey performance as a whole and disaggregated level by using graphical analysis of the questions with the realizations. Besides, performances of selected indices of CTS are tested in terms of their explanatory power of expenditures and related realizations.

We calculate diffusion indices for different age, employment type and income categories and find the differences or similarities according to each group. When we investigate the employment type of the consumers, the most optimistic consumers are employers whereas the most pessimistic group is self-employed consumers. It can be observed that age category makes a difference in consumer behavior according to all survey questions except questions on job opportunities and purchasing semi-durable goods. In addition, consumers' expectations are examined for each question according to their different income levels and it is found that consumers who have high income are more optimistic than those of having low income. Then, different groups of consumers are created by combining the age categories and income levels. Diffusion indices are obtained for each new group and those groups are analyzed in different aspects. Cross correlations with respective realizations are calculated and the groups showing highest and statistically significant correlations with realizations are identified. Afterwards, these identified series are used in the regression models as independent variables where the corresponding realization is taken as dependent variable. The results indicate that the regression coefficients of identified series from CTS are found to be significant for all models. Namely, the disaggregated series have explanatory power of realizations.

The empirical findings show that demographic breakdown improves the indices' explanatory and predictive powers. The groups that are found to have the highest correlations can improve the short term forecasts and enrich conjectural analyses. Therefore, it is suggested to use these disaggregated indices rather than aggregated ones.

This study has shed some light on the relationship between Turkish consumers' expectations and consumption at disaggregated level. Yet, additional research is required on the role of the disaggregated survey data in forecasting macroeconomic variables in macroeconomic models.

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APPENDIX

Appendix A: Method Comparisons of old and new CTS

Previous Method (2003-2012)	***New Method (2013-***
Respondent Characteristics: All individuals in household aged 15+, earning income	Respondent Characteristics: One individual randomly selected from a household aged 16+
Questionnaire Design: Annexed survey to Household Labor Force Survey (LFS)	Questionnaire Design: Independent sample
Field period: 8-23rd days of each month	Field Period: 1-15th days of each month
Announcement schedule: Following 15th of each month, previous months' results are published	Announcement schedule: At the last week of each month, same months' results are published
Mode: Field, face to face (CAPI)	Mode: Field, face to face (CAPI)
Sample size: around 8000	Sample size: 4848
Sampling method: Two stage stratified clustered sampling	Sampling method: Three stage stratified clustered

	systematic sampling
Weighting: Latest LFS results are used (by age, income, work, location)	Weighting: Projected population registers are used (by age, gender, location)
Total number of questions: 15	Total number of questions: 18

Appendix B: CTS Questions

1. Compared to the past 6 months, how do you assess your present purchasing power situation?
    1. Much more better
    2. A little bit better
    3. Remain the same
    4. A little bit worse
    5. Much more worse
    6. No idea
2. How do you expect your purchasing power situation to change over the next 6 months?
    1. Much more better
    2. A little bit better
    3. Remain the same
    4. A little bit worse
    5. Much more worse
    6. No idea
3. Compared to the past 3 months, how do you assess the present general economic situation in Turkey?
    1. Much more better
    2. A little bit better
    3. Remain the same
    4. A little bit worse
    5. Much more worse
    6. No idea
4. How do you expect the general economic situation in Turkey to develop over the next 3 months?
    1. Much more better
    2. A little bit better
    3. Remain the same
    4. A little bit worse
    5. Much more worse
    6. No idea
5. How do you expect the job opportunities in Turkey to change over the next 6 months?
    1. Increase sharply
    2. Increase slightly
    3. Remain the same

4. Fall slightly
5. Fall sharply
6. No idea

6. Compared to the past 3 months, how do you expect your or your household's spending money on semi-durable goods (clothes, shoes, kitchen equipment, etc.) to change over the next 3 months?
    1. Increase sharply
    2. Increase slightly
    3. Remain the same
    4. Fall slightly
    5. Fall sharply
    6. No idea
7. Do you think now it is the right moment for people to buy durable consumption goods such as refrigerator, TV, furniture, etc.?
    1. Yes, it is the right time now
    2. It is neither the right time nor the wrong time
    3. No, it is not the right time now
    4. No idea
8. How likely are you or your household to buy durable goods like refrigerator, TV, furniture over the next 6 months?
    1. Very likely
    2. Fairly likely
    3. Not likely
    4. Not at all likely
    5. No idea
9. How likely are you or your household to buy a car over the next 6 months?
    1. Very likely
    2. Fairly likely
    3. Not likely
    4. Not at all likely
    5. No idea
10. How likely are you or your household to buy or build a home (to live in yourself, for a member of your family, for rent, as a holiday home, etc.) over the next 12 months?
    1. Very likely
    2. Fairly likely
    3. Not likely
    4. Not at all likely
    5. No idea
11. How likely are you or your household to spend any money on home improvements or renovations (spendings on heating system, whitewash, kitchen-bath repairs, etc. except spendings on little amount of purchases) over the next 6 months?
    1. Very likely
    2. Fairly likely
    3. Not likely

4. Not at all likely
5. No idea

12. How likely are you or your household to borrow money (consumer credits, other borrowings) to finance consumption expenditures over the next 3 months?
    1. Very likely
    2. Fairly likely
    3. Not likely
    4. Not at all likely
    5. No idea
13. In view of the general economic situation, how do you assess saving (TRL, foreign currency, gold, deposit, other financial investment instruments, etc.) time condition?
    1. A very good time to save
    2. A fairly good time to save
    3. Not a good time to save
    4. A very bad time to save
    5. No idea
14. How likely are you to save (TRL, foreign currency, gold, deposit, other financial investment instruments, etc.) over the next 6 months?
    1. Very likely
    2. Fairly likely
    3. Not likely
    4. Not at all likely
    5. No idea
15. In comparison to the realizations, how do you expect that prices will develop over the next 12 months?
    1. Increase more rapidly
    2. Increase at the same rate
    3. Increase at a slower rate
    4. Stay about the same
    5. Fall
    6. No idea

Appendix C: Statistical Criteria to Compare Models

RMSE (Root Mean Square Error) = $\sqrt{\sum_{t=1}^{T}(\widehat{y_t} - y_t)^2/T}$

MAE (Mean Absolute Error) = $\sum_{t=1}^{T} \ |\widehat{y_t} - y_t|/T$

Theil Inequality Coefficient = $\dfrac{\sqrt{\frac{\sum_{t=1}^{T}(\widehat{y_t}-y_t)^2}{T}}}{\left(\sqrt{\frac{\sum_{t=1}^{T}\widehat{y_t}^{\,2}}{T}}+\sqrt{\frac{\sum_{t=1}^{T}y_t^{\,2}}{T}}\right)}$

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