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CONSUMERS' OPINIONS ABOUT MACROECONOMIC VARIABLES

Nicoletta Pashourtidou
Economics Research Centre

Andreas Tsiaklis
Economics Research Centre

Zenon Kontolemis
Ministry of Finance and Economics Research Centre

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CONSUMERS' OPINIONS ABOUT MACROECONOMIC VARIABLES [1]

N. Pashourtidou, A. Tsiaklis and Z. Kontolemis

Abstract

This paper evaluates the information content of the Cyprus Consumer Survey data in relation to private consumption growth and inflation. The analysis about consumption is juxtaposed with a similar exercise for the Euro Area. With respect to inflation, both qualitative and quantitative consumers' perceptions/expectations are explored at aggregate and micro level respectively. The results of this paper show that the predictive content of Consumer Survey data for consumption growth is rather modest and that we could construct an alternative Consumer Confidence Indicator which is more informative of consumption growth in Cyprus than the one published by the European Commission. Our results regarding quantitative inflation perceptions and expectations in Cyprus are along the lines of other studies that use Consumer Survey data collected under the Joint Harmonised European Union Programme of Consumer Surveys, namely that consumers considerably overstate both perceived and expected inflation rate. The error between perceived/expected inflation and actual inflation depends on consumer-specific characteristics. Despite that, qualitative inflation expectations and, to a lesser degree, perceptions seem to contain some information for future inflation.

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Ν. Πασιουρτίδου, Α. Τσιακλής και Ζ. Κοντολαίμης

ΠΕΡΙΛΗΨΗ

Στόχος του Δοκιμίου είναι η αξιολόγηση των στοιχείων από τις Έρευνες Οικονομικής Συγκυρίας Καταναλωτών στην Κύπρο σε σχέση με τις επίσημες δημοσιευμένες μακροοικονομικές μεταβλητές για την ιδιωτική κατανάλωση και τον πληθωρισμό. Η ανάλυση για την κατανάλωση αντιπαρατίθεται με τα αποτελέσματα που προέκυψαν από παρόμοια ανάλυση για την Ευρωζώνη. Διερευνούνται, επίσης, οι ποιοτικές και ποσοτικές αντιλήψεις και προσδοκίες για τον πληθωρισμό σε συνολικό και ατομικό επίπεδο.

Τα αποτελέσματα της ανάλυσης δείχνουν ότι: (α) τα στοιχεία από τις Έρευνες των Καταναλωτών περιέχουν κάποιες πληροφορίες για σκοπούς πρόβλεψης του ρυθμού μεταβολής της ιδιωτικής κατανάλωσης και (β) θα μπορούσε να κατασκευαστεί ένας εναλλακτικός Δείκτης Προσδοκιών Καταναλωτών ο οποίος να ενσωματώνει πολύ περισσότερες προπορευόμενες πληροφορίες για την πορεία της κατανάλωσης στην Κύπρο από ό,τι αυτός που δημοσιεύεται από την Ευρωπαϊκή Επιτροπή. Τα αποτελέσματα σχετικά με τις ποσοτικές αντιλήψεις και προσδοκίες των καταναλωτών για τον πληθωρισμό στην Κύπρο είναι πολύ παρόμοια με αυτά για άλλες χώρες που συμμετέχουν στο Εναρμονισμένο Πρόγραμμα Ερευνών Οικονομικής Συγκυρίας της ΕΕ και δείχνουν ότι οι καταναλωτές υπερεκτιμούν σε μεγάλο βαθμό τον τρέχοντα και μελλοντικό πληθωρισμό. Το σφάλμα μεταξύ των ποσοτικών αντιλήψεων/προσδοκιών των καταναλωτών και του πραγματοποιηθέντος πληθωρισμού εξαρτάται από διάφορα χαρακτηριστικά των καταναλωτών. Παρ' όλα αυτά οι ποιοτικές προσδοκίες, και σε μικρότερο βαθμό οι ποιοτικές αντιλήψεις, φαίνεται να περιέχουν κάποιες πληροφορίες για την εξέλιξη του πληθωρισμού βραχυχρόνια.

Αν και τα ευρήματα του Δοκιμίου για την κατανάλωση και τον πληθωρισμό δεν αποκλίνουν από αυτά άλλων μελετών για άλλες χώρες, θα πρέπει να γίνουν προσπάθειες, στο πλαίσιο του Εναρμονισμένου Προγράμματος Ερευνών Οικονομικής Συγκυρίας, με κατάλληλη τροποποίηση του ερωτηματολογίου, ούτως ώστε να διατυπώνονται αντιλήψεις και προσδοκίες που να είναι πιο κοντά στο επίπεδο του πληθωρισμού. Επιπλέον, μια πιο στοχευμένη έρευνα μεταξύ επαγγελματιών/εμπειρογνωμόνων για τις μακροοικονομικές συνθήκες και προοπτικές, που να τυγχάνει σημαντικής προβολής στην κυπριακή κοινωνία, πιθανότατα θα δώσει πιο χρήσιμα αποτελέσματα για την κυπριακή οικονομία, θα συνεισφέρει στην πληροφόρηση και εκπαίδευση του κοινού γύρω από οικονομικά θέματα και πιθανόν θα έχει θετική επίδραση στα αποτελέσματα της τρέχουσας Έρευνας Καταναλωτών.

1. INTRODUCTION

The Consumer Survey conducted in Cyprus as part of the Joint Harmonised European Union (EU) Programme of Business and Consumer Surveys, consists of qualitative data on consumers' perceptions and expectations about a number of economic variables relating to the household and the economy. Moreover, the survey collects data on quantitative inflation perceptions and expectations. Such survey data are useful if they contain leading and useful predictive information about macroeconomic series of interest such as output, private consumption and inflation. The findings in the literature about the usefulness of Consumer Survey data are rather mixed.

The purpose of this paper is twofold. First, we evaluate the predictive content of Consumer Survey data for real private consumption growth, since private consumption accounts for about 68% of Gross Domestic Product. We also examine whether Consumer Survey data can explain movements in consumption growth that cannot be captured by officially-published quantitative macroeconomic series such as labour income, interest rates, stock exchange index and past consumption growth. Second, we explore the relationship between consumers' inflation perceptions/expectations and actual inflation rate, and examine whether the error between consumer quantitative inflation perceptions/expectations and actual inflation is random or varies systematically with particular demographic or socioeconomic characteristics.

Several studies have investigated the ability of consumer confidence to predict consumption in a number of countries. For example, for the United States, Carroll et. al. (1994) found that the Index of Consumer Sentiment published by the University of Michigan has predictive power over household expenditure and that the Michigan Index explains 14% in the variation of consumption growth. However, when combined with other macroeconomic variables, the forecasting power of the Index decreases significantly. Ludvigson (2004) also found that both US Consumer Sentiment Indices have modest incremental forecasting power over consumption growth when the Indices are used along with other available information, such as labour income growth, real share prices and interest rates. A similar finding is reported in Al-Eyed et al. (2009) for five major OECD countries.

Cotsomitis and Kwan (2006) examined the ability of different measures of consumer confidence to predict real consumption across nine EU countries and found that in four out of nine countries the forecasting power might be higher when using the aggregate Consumer Confidence Indicator for the EU as a leading indicator rather than the country-specific Indicator. Their out-of-sample analysis indicates that the various confidence indicators provide weak information on the future path of actual consumption. Nahuis and Jansen (2004) examined whether the Consumer Confidence Indicator and the Retail Confidence Indicator are useful for monitoring

consumption growth in eight European countries. Their results suggest that the Retail Confidence Indicator appears to be sufficient for monitoring consumption in the UK in the short-term, while for France, Italy and Spain they concluded that only the CCI appears to contain valuable information. For the remaining four countries, they found that combining the two Indicators into a composite one leads to optimal results.

The results of this paper show that the predictive content of Consumer Survey data for consumption growth is modest, although one could construct an alternative consumer confidence indicator which can be more informative about consumption growth in Cyprus than that published by the European Commission.

A number of studies have also analysed the responses on inflation perceptions and expectations collected through the Joint Harmonised EU Programme of Consumer Surveys (e.g. Biau et al. 2010; Lindén 2005; Malgarini 2007). They all find that consumers' quantitative estimates of perceived and expected inflation are considerably higher than official inflation rates in various countries. They also show that inflation opinions vary with socioeconomic and demographic characteristics.

Using micro-data from three main surveys for the UK Blanchflower and MacCoille (2009) investigated how consumers form inflation expectations. They report high non-response rates in all surveys, with non-responses being especially significant among females, the young, the least educated and low-income individuals. Inflation expectations fall with education and income, while older people tend to have higher inflation expectations. Individuals' perceptions of current inflation are highly significant in determining inflation expectations, indicating that price expectations are backward looking. Similarly, Lombardelli and Saleheen (2003) found that age, geographical location, education and housing status may be explaining differences in inflation awareness in the UK. For non-European countries, the role of demographic characteristics in the formation of inflation expectations is explored in e.g. Leung (2009), Bryan and Ventaku (2001).

Our results regarding quantitative inflation perceptions and expectations for Cyprus are along the lines of other studies that use Consumer Survey data collected under the Joint Harmonised European Union Programme of Consumer Surveys, namely consumers severely overstate both perceived and expected inflation rate. The error between perceived/expected inflation and actual inflation depends on consumers' characteristics. Despite that, qualitative inflation expectations and, to a lesser degree, perceptions seem to contain some information for future inflation.

The paper is organised as follows. Section 2 describes the data. Section 3 uses descriptive statistics and econometric analysis to investigate the relationship between Consumer Survey data and real consumption growth in Cyprus. The results for Cyprus are then compared to those obtained from a similar analysis for the Euro Area (EA). Section 4 investigates the information content of qualitative inflation perceptions and expectations for officially published inflation rate and evaluates the quality of data on quantitative inflation perceptions and expectations. Section 5 concludes.

2. DATA

2.1 Consumer Survey data

Consumer Survey in Cyprus was launched in May 2001, as part of the Joint Harmonised European Union Programme of Business and Consumer Surveys. Since May 2008, the Economics Research Centre of the University of Cyprus, in collaboration with RAI Consultants Public Ltd, has been conducting the survey in Cyprus on a monthly basis. The Consumer Survey is carried out via telephone interviews using a random sample of 500 consumers.[2] Consumer survey data are characterised by timeliness, since they are readily available at the end of each reference month.

The Consumer Survey consists of twelve monthly questions, while three quarterly questions are added to the survey each January, April, July and October. Consumers are asked, among other things, to state their perceptions and expectations about the financial situation of the household and the economic situation in the country, their expectations about unemployment and prices, as well as their intentions to save money and to make major purchases (i.e. car, house, etc.) in the short-run.[3] Individual data therefore, are in the form of qualitative responses and aggregate data are given by the percentages of consumers that provided positive or negative replies. Net balances, used as aggregate variables in the analysis, are defined as the difference between the proportion of respondents who supplied positive responses each month from the proportion of respondents who supplied negative responses. Moreover, the results of Consumer Survey are grouped by respondents' education level, age, gender, income bracket and working regime. The net balances are then employed in the calculation of the monthly consumer confidence indicator that highlights the consumers' perceptions and expectations about the economy.

[2] This applies as of May 2008.

[3] For the Consumer Survey, the answers are given according to a five-option ordinal scale for example: "got a lot better" (++), "got a little better" (+), "stayed the same" (=), "got a little worse" (-), "got a lot worse" (--) or "very likely", "fairly likely", "not likely", "not at all likely", etc (see User Guide, European Commission 2007)

In addition to the qualitative questions the survey asks the participants to provide quantitative responses about changes in consumer prices over the past and next 12 months. In other words, the survey collects data on quantitative inflation perceptions and expectations.

Our analysis uses quarterly Consumer Survey data of the EA and Cyprus, collected by the European Commission, covering the period 2001Q3-2010Q3. Quarterly variables are constructed as averages of the monthly series. The analysis of quantitative inflation opinions employs individual data collected between May 2008 and April 2011.

2.2 Official quantitative data

Cyprus data on final consumption expenditure of households at constant 2005 prices were obtained from the National Accounts of the Statistical Service of Cyprus. Moreover, we use a number of quantitative macroeconomic variables widely used in other relevant studies (e.g. Ludvigson 2004) to examine whether survey data contain information for future consumption not already present in other available macro series. Such series include labour income, stock prices and interest rates. In particular a proxy of disposable labour income, using National Accounts and General Government Accounts data, was constructed as the sum of wages/salaries and social benefits minus taxes and social contributions. Data on Cyprus Stock Exchange (CSE) Index were taken from the Global Financial Data database. Both labour income and CSE Index were deflated by the implicit deflator for private consumption. We also use the interest rate for consumer credit published by the Central Bank of Cyprus.[4]

For the analysis regarding inflation we use data on Consumer Price Index (CPI) obtained by the Statistical Service.[5]

For EA, private consumption at constant 2000 prices was obtained from the Eurostat database. Disposable labour income defined above, was deflated by the implicit EA deflator of private consumption. Data on Euro Dow Jones Stoxx Price Index and the Europe Eurozone Harmonised Consumer Price Index (HICP) were taken from the Global Financial Data database. Three alternative interest rate series, collected from the Global Financial Data database, are used for the EA analysis: the 3-month Euribor, the Europe mortgage lending rate and the Europe consumer credit lending rate.[6]

[4] The interest rate for house purchase also published by the Central Bank of Cyprus is used as an alternative interest rate variable. Interest rate series are published monthly and are converted into quarterly frequency by taking the observation corresponding to the last month of the quarter.
[5] The base year for the CPI is 2005.
[6] All series used in the analysis were seasonally adjusted.

2.3 Data transformations

First we explore basic data properties, such as whether they contain a unit root or not, and therefore whether one should use levels or year-on-year differences of the variables.[7] We find that all Consumer Survey variables in levels contain a unit root (a stochastic trend) except from the variable on "Savings over the next 12 months" which appears to be stationary. The unit root hypothesis is rejected for all Consumer Survey variables in differences at the 10% level, hence the transformed series can be treated as stationary. As far as the quantitative variables are concerned, the logarithms of the levels of consumption, real labour income, Cyprus Stock Exchange Index and of the CPI contain a unit root. Disposable labour income and the Cyprus Stock Exchange Index are deflated by the private consumption implicit price deflator. When the aforementioned variables are expressed in year-on-year growth rates, the transformed series are stationary. The unit root hypothesis for the level of unemployment rate and the interest rate on consumer credit is rejected at 10% but not at 5% level of significance (Table A1).

3. CONSUMPTION

3.1 Descriptive analysis

In this section we examine graphically and with the use of descriptive statistics the association between Cyprus Consumer Survey data and real private consumption growth.

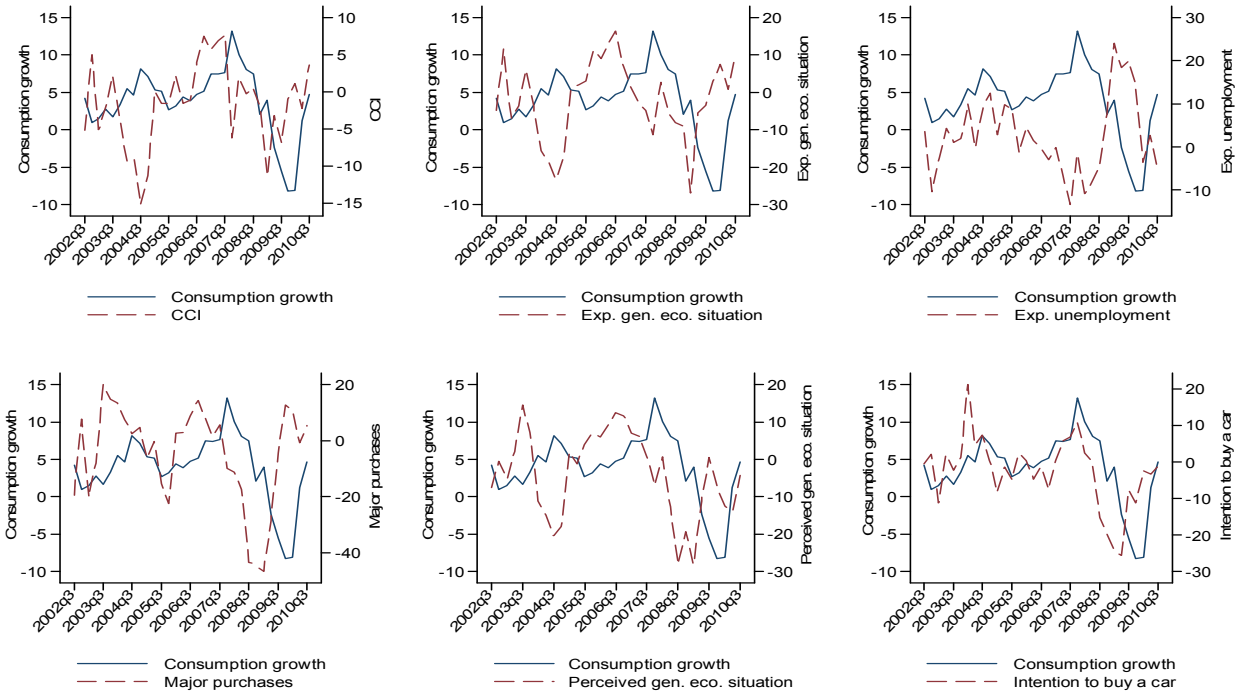
Given the results of the unit root tests, the analysis is carried out using year-on-year changes or growth rates of the variables. Table A2 shows the correlation coefficients, together with the corresponding p-values of Consumer Confidence Indicator (CCI) and its components (in year-on-year changes) with consumption growth. CCI lagged four quarters is moderately correlated with consumption growth indicating the presence of leading information in the indicator for future consumption. The modest correlation results from the fact that consumption growth shows virtually zero correlation with two of the CCI components i.e. the "Financial situation of the household over the next 12 months" and "Savings over the next 12 months". However, the lags of the remaining components, namely the "General economic situation over the next 12 months" and "Unemployment over the next 12 months" correlate significantly with consumption growth. In particular, the year-on-year changes of the expectations about the economic situation in Cyprus shows positive correlation of 0.53 with consumption growth, whereas the first and second lag of changes in the unemployment expectations exhibit negative correlation of 0.68. Interestingly, as shown in Table A3 and A4, there are some Consumer Survey variables which

[7] Quarter-on-quarter differences of Consumer Survey variables exhibit weaker correlations with quarter-on-quarter growth rates or differences of quantitative variables (e.g. consumption, unemployment and CPI) than their year-on-year counterparts.

are not included in the calculation of the CCI but are highly correlated with consumption growth such as the "General economic situation over the last 12 months, "Major purchases at present, "Major purchases over the next 12 months" and "Car purchase over the next 12 months".

Figure 1 shows graphically the relation between Consumer Survey variables (right axis) and consumption growth (left axis). We plot the Consumer Survey series that exhibit significant correlation of 0.60 or higher with the relevant quantitative variable. We observe that the Survey variables capture quite well the evolution in private consumption growth, and in many cases (especially after 2006) fluctuations in the former lead those in the latter. The year-on-year changes of the Survey variables relating to "Unemployment over the next 12 months" contains leading information about consumption growth after 2004 but in countercyclical manner, since expectations about low (high) unemployment in the short-run are followed by accelerated (slower) consumption growth. Notice finally how the last three series predict relatively well, and with a considerable lead, the downturn that begun in 2008 following the recent major financial crisis.

Figure 1: Consumption vs. Consumer Confidence Indicator and its components



Note: The Consumer Survey variables are in year-on-year changes.

3.2 Econometric analysis: Cyprus

Predictive power

Next we use regression analysis to assess the explanatory power of different Consumer Survey variables for consumption growth and therefore to evaluate the usefulness of these series in forecasting consumption.

We regress consumption growth on year-on-year changes of CCI and the year-on-year changes of alternative Survey variables that exhibited strong correlation with consumption growth at the preliminary stage of analysis. We use as regressors the lags of the Survey variables since only lagged values are significantly correlated with consumption. Moreover, we present the results for models that include only the statistically significant lags. Table 1 presents the estimation results for various models that include alternative Consumer Survey variables.

Table 1: Consumption growth against Consumer Survey variables, Cyprus

Consumer Survey variables[1]	Lag	Significance of lagged Survey variables[2]	Adjusted R^2
Consumer Confidence Indicator	4	4.540 [0.042]	0.140
General economic situation in Cyprus, last 12 months	4	24.490 [0.000]	0.676
Unemployment expectations, next 12 months	1, 2	10.000 [0.001]	0.563
Major purchases at present	3, 4	40.370 [0.000]	0.761
General economic situation in Cyprus, next 12 months	4	6.760 [0.015]	0.249
Major purchases, next 12 months	1, 4	13.840 [0.000]	0.606
Intention to buy a car, next 12 months	2, 3	26.950 [0.000]	0.676
New Consumer Confidence Indicator	2, 3, 4	75.28 [0.000]	0.880

[1] All Consumer Survey variables are expressed in year-on-year changes.

[2] Entries show the value of F-statistic and p-values are shown in square brackets. The test statistics shown are corrected for first order error autocorrelation.

The CCI and the "General economic situation over the next 12 months" exhibit the weakest significance in the consumption regression and the lowest R^2: for example, year-on year changes in CCI explain about 14% of the variation in consumption growth. Other survey variables however, such as

a) "Major purchases at present",

b) "General economic situation over the past 12 months",

c) "Car purchases over the next 12 months",

d) "Major purchases over the next 12 months", and

e) "Unemployment over the next 12 months"

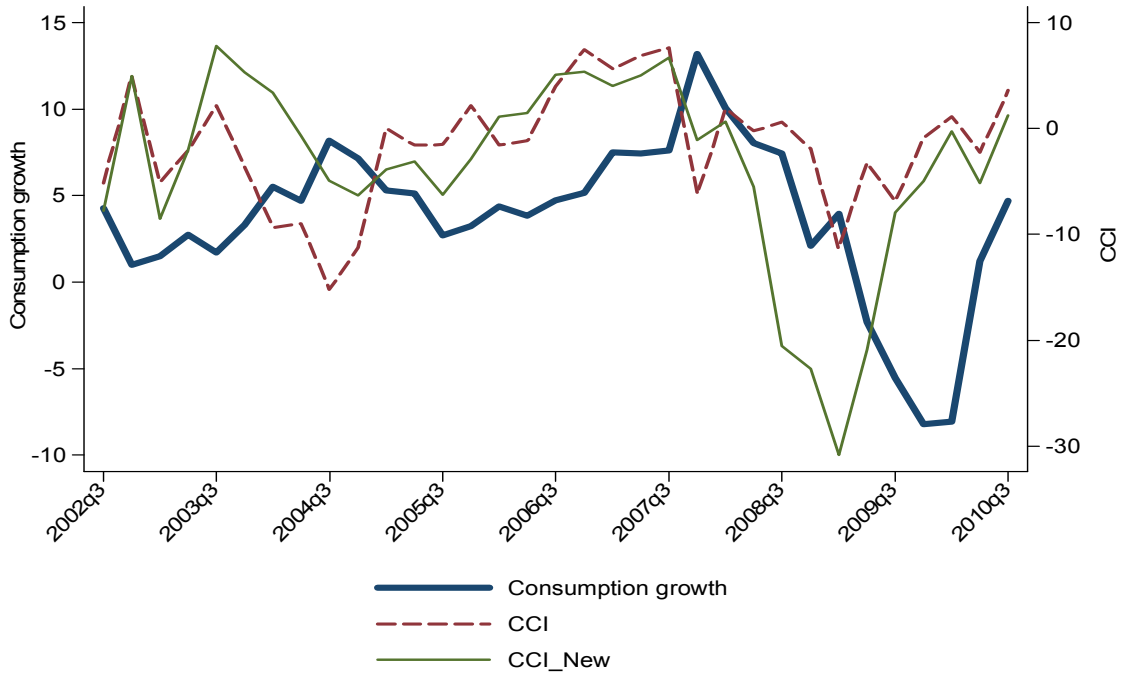
explain at least 60% of the variation of consumer growth. This finding suggests that we could construct an alternative CCI for Cyprus based on some or all of the Survey variables in (a)-(e) above; that is we can exclude those series that possess no explanatory power over consumption.

Hence we consider regressions of consumption growth on the five Survey variables in (a)-(e). Due to the small number of observations in our sample we consider only one significant lag of each variable in (a)-(e) at a time, which results in 16 regressions. Then, combinations of the variables in the regressions with the highest adjusted R^2 is used to construct the new CCI. The results of the model with the highest adjusted R^2 are shown in Table A6. We observe that the five Survey variables account for 92% of the variation in consumption growth, even though the variable for consumer expectations about major purchases turned out to be insignificant. Thus, we construct a new CCI as the simple average of the Consumer Survey variables relating to the general economic situation over the past 12 months, major purchases at present, car purchases over the next 12 months and unemployment expectations (with inverted sign). The construction of the new CCI is based on the regression results presented in the Appendix (Table A6).

Figure 2 shows that the new CCI incorporates significantly more leading information about consumption growth than the CCI computed by EC. The new CCI predicts the slump in consumption growth in 2009-2010, which was not adequately reflected in the officially published CCI.

Looking at the results using the new CCI at the last row of Table 1 we conclude that this alternative indicator could be more useful in forecasting consumption growth as it explains 85% in the variation in consumption growth i.e. about 70% more than the CCI constructed by the EC.

Figure 2: Consumption vs. Consumer Confidence Indicators



Note: Consumer confidence indicators are in year-on-year changes.

The results of Table 1 show that Consumer Survey variables have considerable predictive power for year-on-year consumption growth. However, we need to investigate whether Consumer Survey data continue to contain valuable information for forecasting consumption growth when other quantitative macroeconomic variables are included in the regressions. We employ a number of quantitative variables that were also used in similar exercises for other EU countries and for the United States (e.g. Carroll et al. 1994, Cotsoumitis and Kwan 2006, Ludvigson 2004). Such variables include (a) lags of year-on-year consumption growth, (b) year-on-year growth of real disposable labour income, (c) year-on-year growth rate of real Cyprus Stock Exchange index and (d) first difference of interest rate on consumer credit.

Table 2 shows the results of regressions of consumption growth on quantitative economic variables and alternative Consumer Survey variables. Alternative lag lengths of the variables were included in the regressions but Table 2 presents the most parsimonious models with significant coefficients that pass the diagnostic test of residual autocorrelation and dynamic heteroskedasticity (ARCH). The interest rate on consumer credit is insignificant therefore it is dropped from subsequent regressions that include the Consumer Survey variables.[8] The second column of Table 2 shows the results for the model that includes only the quantitative macro variables. All variables have the expected sign. The quantitative variables alone account for 82% of the variation in consumption growth. The

[8] The same applies in the case where interest rate on housing loans is used.

remaining columns of Table 2 present the results of models that include in addition to the quantitative variables, alternative Consumer Survey variables. All Consumer Survey variables have the expected sign namely a positive effect on consumption growth, except for the unemployment expectations variable that has a negative impact on consumption. In general, the additional variation in consumption growth explained by Consumer Survey variables is rather small, ranging from 3% to 9%. In particular the inclusion of the new CCI constructed as an alternative to the CCI of the EC, explains an extra 5% of the variation in consumption compared to an additional 3% increase in the variation explained when the EC CCI is used.

Looking at the components of new CCI individually, we observe that the unemployment expectations variable is the most informative in forecasting consumption growth with an associated adjusted R^2 of 91%. We also find that the individual Survey variables affect consumption with different lag structure than the new CCI. For example, the new CCI enters the consumption regression with the fourth lag, while the variable on unemployment expectations and intentions for car purchase in the near future enter with the first and third lag respectively. Thus it appears that some Survey variables lead consumption growth more than others.

Model stability

Next we examine the stability of simple models that could be used for short-term forecasting of consumption growth. Such models include autoregressions, dynamic models that incorporate information from relevant macro variables, the CCI by EC or the new CCI constructed above. The models under examination were selected on the basis of coefficient significance and diagnostic tests for error autocorrelation and dynamic conditional heteroscedasticity. The stability is examined by testing for breaks at unknown dates in the model coefficients using the Quandt Likelihood Ratio (QLR) statistic. The QLR test can detect a single discrete break, multiple discrete breaks or a slow evolution of the regression function in the central 70% of the sample (see Stock and Watson 2003).

Figure 3 shows the break dates detected by the QLR test over the sample period, for different models, together with the values of the QLR test statistic for which the null hypothesis of time invariant coefficients is rejected at 5% level. The year-on-year GDP growth is superimposed to associate the break dates suggested by the test with the state of the economy. During the recovery period 2003-2004 the test detects breaks in the coefficients of all models. Models that include either macro variables or the CCI of the EC appear to be the most unstable. A simple AR with the first and fourth lag of consumption growth and a model with lags of the new CCI are associated with fewest breaks. Given the timeliness of the new CCI and the relative good performance in terms of stability of the simple dynamic model that includes it, we can conclude that such a model could be used in the construction of timely forecasts for consumption growth and in monitoring consumption in Cyprus.

Table 2: Consumption growth against macro and Consumer Survey variables, Cyprus[1]

Variables[2,3]	Quantitative macro variables only	CCI	New CCI	General econ. situation, last 12 months	Unemployment expectations, next 12 months	Major purchases at present	Intention to buy a car, next 12 months
Consumption (1)	0.513 (4.940)	0.466 (4.710)	0.081 (0.490)	0.428 (4.280)	0.528 (7.100)	0.251 (1.780)	0.331 (2.620)
Real disposable labour income (4)	0.144 (2.210)	0.166 (2.710)	0.070 (1.150)	0.125 (2.080)	0.208 (4.300)	0.043 (0.590)	0.120 (1.950)
Cyprus Stock Exchange Index (3)	0.044 (5.520)	0.043 (5.880)	0.038 (5.480)	0.029 (3.170)	0.021 (2.870)	0.036 (4.550)	0.041 (5.570)
Consumer Confidence Indicator (4)		0.146 (2.210)					
New Consumer Confidence Indicator (4)			0.253 (3.100)				
General econ. situation, last 12 months (4)				0.123 (2.500)			
Unempl. expectations, next 12 months (1)					-0.232 (-4.970)		
Major purchases at present (4)						0.097 (2.500)	
Intention to buy a car, next 12 months (3)							0.122 (2.240)
Adjusted R^2	0.822	0.846	0.868	0.853	0.909	0.853	0.847
LM test for 1st order autocorrelation[4]	1.544 [0.214]	0.272 [0.602]	1.213 [0.271]	0.878 [0.349]	0.003 [0.953]	1.640 [0.200]	0.050 [0.823]
LM test for 1st ARCH[4]	0.586 [0.444]	1.609 [0.205]	0.001 [0.972]	0.823 [0.364]	0.348 [0.555]	0.500 [0.480]	0.402 [0.526]

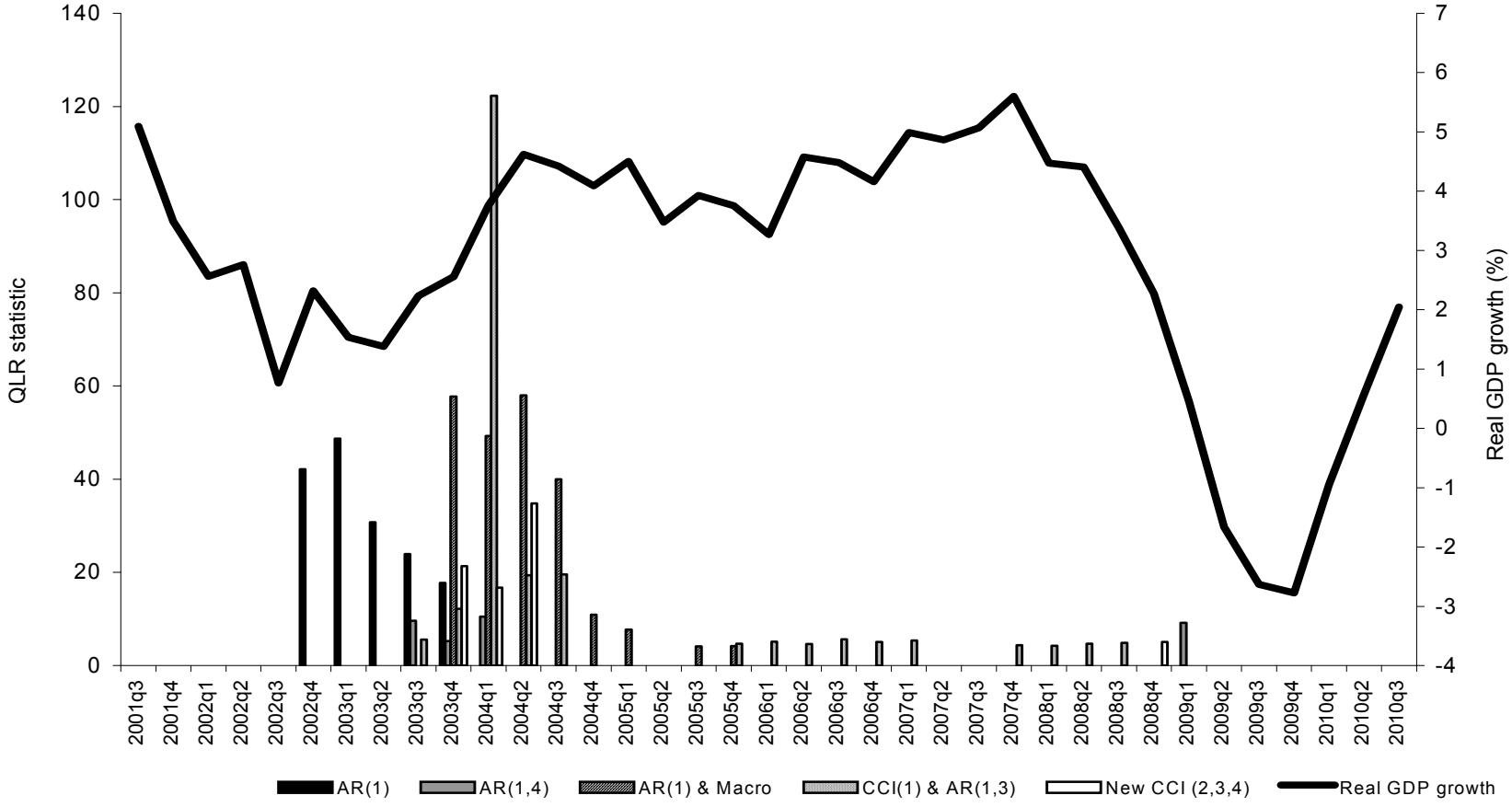
[1] Entries show the value of the coefficient and t-statistics are shown in parentheses.

[2] The quantitative macro variables are expressed in year-in-year growth rates and the Consumer Survey variables in year-on-year changes.

[3] The number in the parentheses next to the variable name indicates which lag of the variable is included in the regression.

[4] Entries show the value of Chi-Squared statistic and p-values are shown in square brackets.

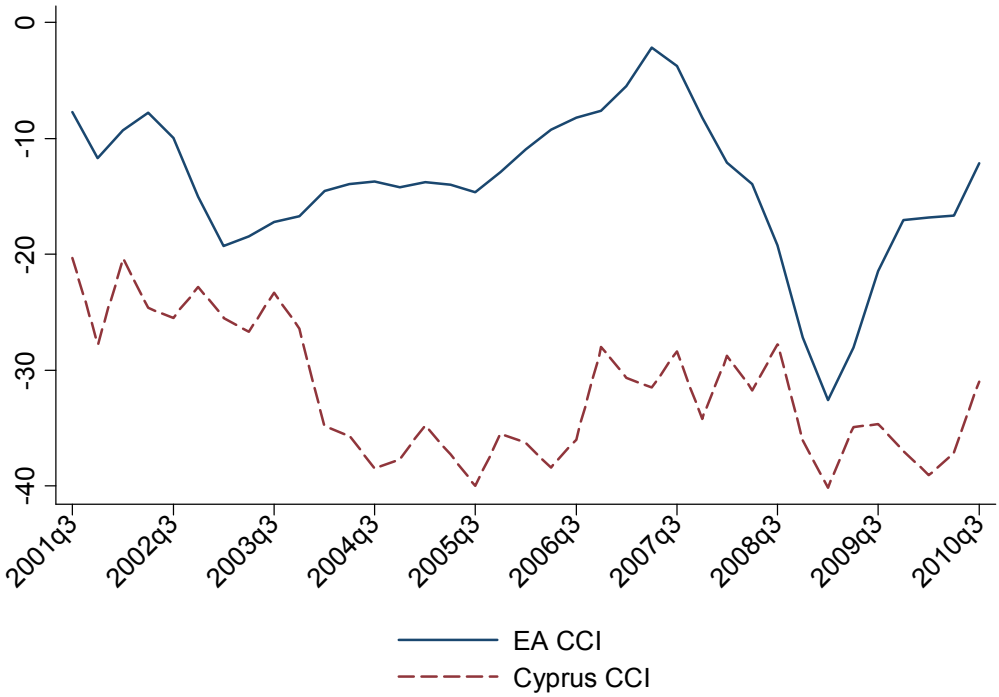
Figure 3: QLR test statistic for models of consumption growth



3.3 Econometric analysis: Euro Area

This section conducts an analysis similar to that of the previous section for Cyprus, using data for the EA and provides a comparison of the results with those obtained for Cyprus. Figure 4 juxtaposes the CCI for EA and Cyprus. The indicator for Cyprus fluctuates at lower levels than the corresponding indicator for the EA, indicating that consumers in Cyprus provide on average more pessimistic responses. The Cyprus CCI exhibits smaller but more frequent swings than the EA CCI. The first downturn in consumer confidence appeared in the EA long before than it did in Cyprus. However, consumer confidence in the EA recovered slowly afterwards, while consumer confidence in Cyprus remained at low levels for a longer time. The CCI for Cyprus showed a rather uncertain recovery in 2007-2009, while the EA CCI experienced a major decline. The lowest point in both indicators was recorded in 2009Q1. After that, the CCI for the EA shows clear signs of recovery while the CCI for Cyprus registers ups and downs that reflect the uncertain economic situation in the country.

Figure 4: Consumer Confidence Indicator, EA and Cyprus



The correlation of consumption growth and CCI in the EA data is stronger than in the Cyprus data and it is driven mainly by the high correlation of consumption growth with unemployment expectations and with expectations about the general economic situation over the next 12 months, as shown in Table A2. The results in Table A3 and A4 show however, that there are, other Consumer Survey questions that are not part of the CCI which exhibit higher correlation

with consumption growth than the CCI. Such variables relate to the general economic situation in the past 12 months and the expectations regarding major purchases over the next 12 months. This finding arises also in the Cyprus data (Table A2).

Table 3 shows the results of regressions of EA consumption growth on the CCI and some Consumer Survey questions that were found to be strongly correlated with consumption growth. Unlike the case with Cyprus, the CCI for the EA appears to be a useful variable for forecasting consumption, as the lags of the former explain about 80% of the variation in the growth rate of consumption. Looking at the components of the CCI, we find that unemployment expectations over the next 12 months and expectations about the general economic situation explain 82% and 68% respectively of the variation in the EA consumption growth in the following quarter. Other survey questions that are not included in the CCI such as expectations about major purchases over the next 12 months and perceptions about the general economic situation over the last 12 months capture considerable proportion of the variation in consumption growth.

Table 3: Consumption growth against Consumer Survey variables, EA

Consumer Survey variables[1]	Lag	Significance of lagged Survey variable[2]	Adjusted R^2
Consumer Confidence Indicator	1, 2, 4	38.040 [0.000]	0.800
General economic situation, last 12 months	1, 4	40.830 [0.000]	0.768
Unemployment expectations, next 12 months	1, 2, 4	113.150 [0.000]	0.819
Major purchases at present	1, 4	136.640 [0.000]	0.826
General economic situation, next 12 months	1, 2, 4	25.910 [0.000]	0.675
Financial situation of household, next 12 months	1, 4	3.580 [0.042]	0.367
Savings over next 12 months	3	2.490 [0.126]	0.131

[1] All Consumer Survey variables are expressed in year-on-year changes.

[2] Entries show the value of F-statistic and p-values are shown in square brackets. Test statistics are corrected for first order error autocorrelation.

We also investigated whether Consumer Survey variables continue to supply predictive information for consumption growth when quantitative macro variables are included in the regression. In other words, we check whether Survey variables contain information for consumption growth beyond that already in macroeconomic indicators, such as past consumption growth, real disposable labour income, interest rate and stock exchange index. As in the previous section, we first regress consumption growth on its lagged values, the lagged values of the year-on-year growth of labour income and stock exchange index and the lagged

values of year-on-year changes of personal lending (consumer credit) rate. We then add the lags of the (year-on-year changes of) CCI or lags of other Survey variables (that were found to explain a large percentage of the consumption growth variation) in the consumption growth regression with quantitative macro indicators. The results are shown in Table 4.

Table 4: Consumption growth against macro and Consumer Survey variables, EA [1]

Variables[2,3]	Quantitative macro variables only	CCI	General econ., next 12 months	Unempl. expectations, next 12 months	General econ. situation, last 12 months
Consumption (1)	0.563 (6.260)	0.295 (1.900)	0.426 (2.940)	0.261 (1.590)	0.217 (1.260)
Lending rate: personal consumer credit (1)	-0.473 (-4.600)	-0.503 (-4.050)	-0.472 (-3.690)	-0.554 (-4.530)	-0.635 (-3.990)
Euro Dow Jones Stoxx Price Index (3)	0.018 (5.170)	0.019 (3.990)	0.021 (4.200)	0.020 (4.540)	0.015 (3.070)
CCI (1, 2, 4)[4]		0.062 (0.042)			
General econ. situation, next 12 months (1, 2, 4)[4]			0.022 (0.215)		
Unempl. expectations, next 12 months (1, 2, 4)[4]				-0.026 (0.013)	
General econ. situation, last 12 months (1, 4)[4]					0.034 (0.063)
Adjusted R^2	0.882	0.908	0.892	0.918	0.901
LM test for 1st order autocorrelation [5]	0.571 [0.450]	0.426 [0.514]	1.012 [0.314]	0.086 [0.770]	0.943 [0.331]
LM test for 1st order ARCH [5]	0.000 [0.990]	0.217 [0.641]	0.132 [0.717]	0.002 [0.967]	0.580 [0.446]

[1] Entries show the value of the coefficient and t-statistics are shown in parentheses.

[2] The quantitative macro variables are expressed as in year-in-year growth rates and the Consumer Survey variables in year-on-year changes.

[3] The number in the parentheses next to the variable name indicates which lag of the variable is included in the regression.

[4] Entries show the sum of the coefficients of the lagged Consumer Survey variables (long-run effect).The p-values that correspond to the F-statistics of the joint significance of the lagged Consumer Survey variables are shown in parentheses.

[5] Entries show the value of Chi-Squared statistic and p-values are shown in square brackets.

Due to the limited number of observations at our disposal we report results for the most parsimonious models that pass the diagnostic tests of residual autocorrelation and ARCH at least at 10% level of significance. The lags of disposable labour income growth are not statistically significant and are dropped. The remaining macro variables have the expected sign and explain 88% of the variation in consumption growth. When lags of the variables are added in

the model the increase in the adjusted R^2 is rather small ranging from 1% to 3.6%. The largest increase in adjusted R^2 results when lags of unemployment expectations are included in addition to the macro indicators. The same finding, where the inclusion of unemployment expectations in the baseline model is associated with the largest increment in adjusted R^2 was reported for Cyprus data too.

The results for the EA show that when relevant macro indicators are included in the consumption growth regression the Consumer Survey variables contain little additional information for future consumption growth.

4. INFLATION

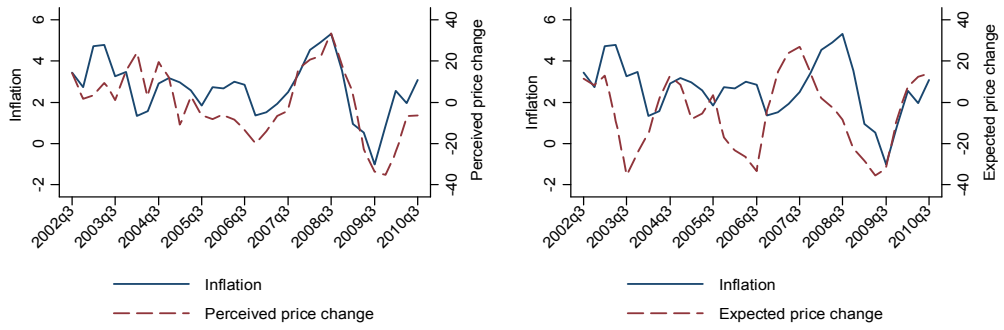
The previous section has investigated the usefulness of various survey variables in predicting consumption, an exercise that is important when assessing the state of the economy and future trends of GDP. In this section we concentrate on inflation expectations, as these are registered in the survey, and how these relate to actual future price developments.

4.1 Qualitative inflation perceptions and expectations

Specifically, we first examine how Consumer Survey data regarding consumers' qualitative inflation perceptions and expectations in Cyprus are related to actual inflation rate.

The lags of Consumer Survey variables relating to consumer price expectations over the next 12 months are significantly correlated with inflation (given by year-on-year growth rate in CPI). Consumers' perceptions about prices seem to follow fluctuations in inflation since their current values and leads are positively and significantly related to current inflation level (Table A5). [9]

Figure 5: Inflation vs. qualitative consumers' perceptions and expectations about price trends



[9] For the EA there is stronger evidence of perceptions following rather than leading inflations. Moreover, there is evidence of a coincident relation of expectations with inflation (Table A5).

The first graph of Figure 5 shows that changes in consumers' perceptions about prices over the past 12 months are mostly coincident with, or even lag current changes in consumers prices. In the second graph of Figure 5 the turning points in the changes in consumers' expectations about prices over the next 12 months appear before those in inflation, which indicates that consumers' price expectations contain leading information about current inflation. These graphs suggest that qualitative inflation expectations might be more informative than perceptions in predicting inflation.

Table 5: Inflation against inflation perceptions/expectations[1]

Consumer Survey variables[2]	Price changes, last 12 months	Price changes, next 12 months
Lags	1, 4	1, 3
Significance of lagged Consumer Survey variable[3]	7.960 [0.002]	12.470 [0.000]
Adjusted R^2	0.457	0.540

[1] Inflation is given by the year-on-year growth rate of CPI.

[2] All Consumer Survey variables are expressed in year-on-year changes.

[3] Entries show the value of the F-statistics and p-values are shown in square brackets. Test statistics shown are corrected for first order error autocorrelation.

Therefore we investigate, using regression analysis, whether these qualitative variables contain useful information in forecasting their quantitative counterpart, namely inflation rate. Table 5 presents the results of regressions of inflation (year-on-year growth rate of CPI) on lagged values of price perceptions or expectations. The Consumer Survey variables explain about half of the variation in explain about half of the variation in actual inflation.

When the Consumer Survey variables are included in the regression together with lagged values of the dependent variable the additional variation in the macro series explained is rather modest as shown in Table 6.[10] Price perceptions and expectations explain an extra of 6% and 7% respectively in inflation variation.

Nevertheless, qualitative perceptions and expectations about price trends provide some indication only about the direction of price changes over the past/next 12 months. The magnitude of consumers' perceptions and expectations about price movements elicited via two quantitative questions and their relevance to actual inflation rate is considered is the following section.

[10] Unemployment rate (either in levels or in year-on-year changes) was also included in alternative specifications of the model but the estimated coefficient was not statistically significant.

Table 6: Inflation against inflation perceptions/expectations and lagged inflation[1, 2]

Variables[3,4]	Lagged inflation only	Lagged inflation + Price changes, last 12 months	Lagged inflation + Price changes, next 12 months
Inflation (1)	0.569 (5.000)	0.261 (1.550)	0.338 (2.250)
Inflation (4)	-0.431 (-3.840)	-0.577 (-4.770)	-0.375 (-3.050)
Changes in prices, last 12 months (1)		0.032 (2.340)	
Changes in prices, next 12 months (1)			0.023 (2.440)
Changes in prices, next 12 months (4)			0.023 (1.950)
Adjusted R^2	0.609	0.667	0.679
LM test for 1st order autocorrelation[5]	2.680 [0.102]	3.117 [0.078]	1.340 [0.247]
LM test for 1st order ARCH[5]	2.174 [0.140]	0.397 [0.529]	0.811 [0.368]

[1] Entries show the value of the coefficient and t-statistics are shown in parentheses.

[2] Inflation is given by the year-on-year growth rate of CPI.

[3] All Consumer Survey variables are expressed in year-on-year changes.

[4] The number in the parentheses next to the variable name indicates which lag of the variable is included in the regression.

[5] Entries show the value of Chi-Squared statistic and p-values are shown in square brackets.

4.2 Quantitative inflation perceptions and expectations

The Consumer Survey collects data on both qualitative and quantitative inflation perceptions and expectations, however the quantitative data used in the analysis that follows are those that have been collected by our institute since May 2008.[11]

The Consumer Survey variables presented so far relate to qualitative data in the sense that they result from consumers' answers to qualitative questions where consumers provide responses about an economic magnitude in question in the form of e.g. "increase", "decrease", "remained the same". The Joint Harmonised Programme of Business and Consumer Surveys by the EC, as well as a number of other consumer surveys conducted in the UK and the US collect quantitative data on consumer perceptions and expectations. The current economic decisions of individuals and firms (saving/spending; wage negotiations; price setting for firms) are based on their expectations about inflation and those decisions subsequently affect actual inflation rate in the future. Thus, inflation expectations in the EA affect the ECB's monetary policy decisions which

[11] Data on quantitative inflation perceptions and expectations are not regularly published by European Commission (see Biau et al., 2010).

are based on a mandate to keep inflation below, but close to 2%, over the medium term. But how close are consumers' quantitative inflation perceptions and expectations to actual current or future realised inflation? A number of studies for EA (e.g. Biau et al. 2010, Lindén 2005, Malgarini 2007), UK (e.g. Benford and Driver 2008, Blanchflower and MacCoille 2009), US (e.g. Bryan and Venkatu 2001) and the New Zealand (e.g. Leung 2009) have found that consumers' quantitative responses regarding inflation perceptions or expectations overestimate actual inflation rate in the economy. The over-prediction of inflation is considerably large in the EA.

Figure 6 plots headline inflation in Cyprus, based on CPI, and HICPI inflation together with consumer quantitative perceived price changes over the last 12 months reported in the Cyprus Consumer Survey. For each month we present the average perceived price change across consumers. Consumers perceived an inflation rate that is considerably higher than actual inflation throughout the period under consideration and the gap ranges from 8% to 18%. [12]

Figure 6: Consumers' perceived price changes vs. actual inflation

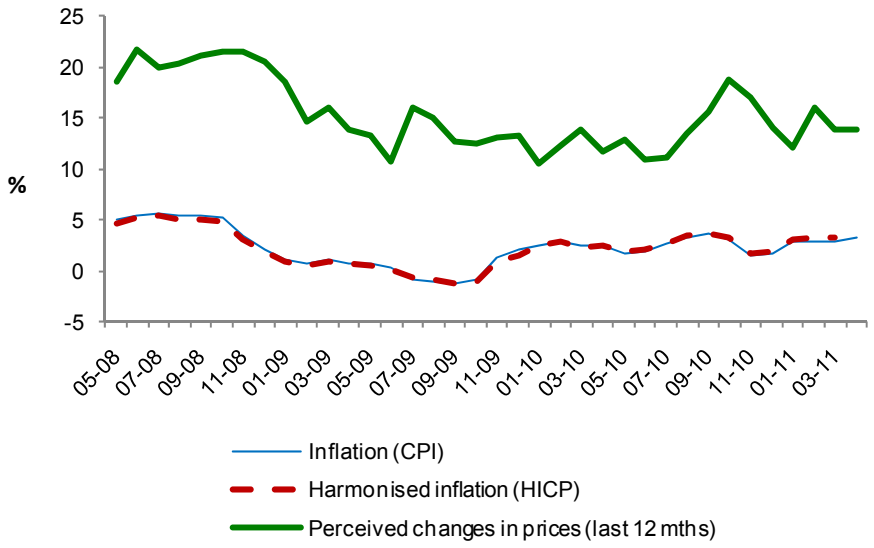
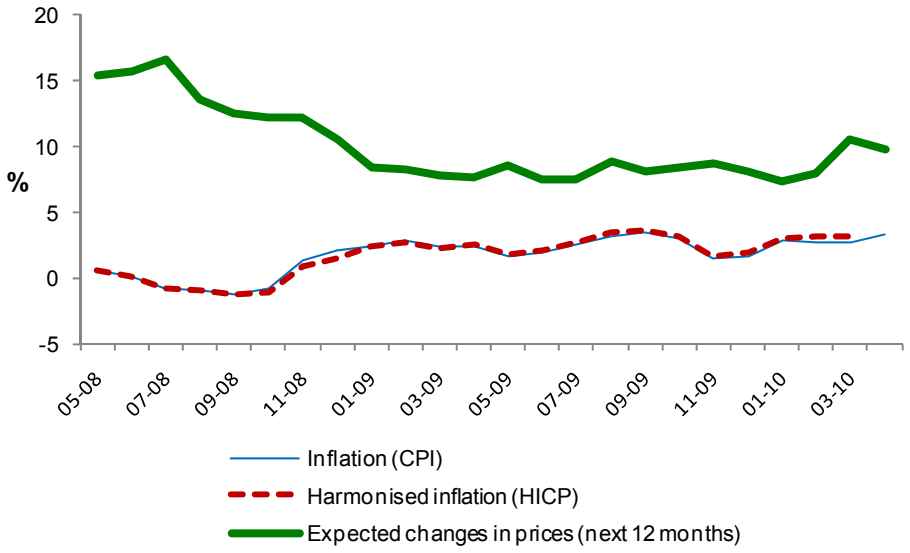


Figure 7 shows consumers' expected price changes 12 months ahead reported between May 2008 and April 2010, together with CPI and HICP inflation rates registered between May 2009 and April 2011 (i.e. realised actual inflation rates). For each month we show the average expected price change across consumers. The gap between expected and actual inflation ranges from 4.6% to 17.4% and shrinks after 2008. Quantitative inflation expectations exhibit correlation of about 0.80 with current inflation but perceptions are less correlated with current inflation; their correlation coefficient is about 0.60.

[12] The sample used throughout the analysis excludes responses higher than 50% and lower than -20%.

Figure 7: Consumers' expected price changes vs. actual inflation



A number of studies showed that individuals with different demographic and socioeconomic characteristics hold different inflation perceptions and expectations. Thus, we investigate using consumers' individual data for the period May 2008-April 2011, whether there are particular demographic and socioeconomic characteristics that influence the gap between perceived/expected and actual inflation or whether this difference is random across consumers.

Table 7 shows the effects of consumers' characteristics on the gap between perceived/expected and actual inflation. In the first model the dependent variable is the (log) difference between perceived price changes over the past 12 months, stated by a consumer in month t, and actual inflation rate in month t, computed as the year-on-year percentage change in CPI. In the second and third model the dependent variable is the (log) difference between expected price changes over the next 12 months, stated by a consumer in month t and actual inflation registered 12 months ahead (i.e. in month t+12).[13, 14,15]

[13] In all models we use the absolute value of the difference.
[14] The sample used in the analysis in the case of expectations covers the period May 2008 - April 2010 since the actual inflation rates used refer to the period May 2009 - April 2011.
[15] The results using HICP inflation are very similar and are omitted for the sake of brevity.

Table 7: Effects of characteristics on consumers' error between perceived/expected and actual inflation[1,2]

Characteristics[3]	Perceived inflation	Expected inflation	Expected inflation
Household income (up to €17000)			
€17001 - €30000	-0.028 (-0.830)	-0.008 (-0.220)	-0.015 (-0.400)
€30001 - €45000	0.032 (1.200)	0.025 (0.760)	0.023 (0.740)
over €45000	-0.030 (-0.730)	0.095 (2.030)*	0.118 (2.630)**
Education (Tertiary)			
Primary	0.017 (0.400)	-0.003 (-0.050)	0.003 (0.060)
Secondary	0.061 (2.450)*	0.034 (1.130)	0.036 (1.220)
Age (30-49)			
18 – 29	-0.077 (-2.000)*	0.049 (1.150)	0.088 (2.100)*
50 – 64	-0.062 (-2.200)*	-0.069 (-1.990)*	-0.083 (-2.460)*
65+	-0.072 (-1.660)	-0.144 (-2.720)**	-0.158 (-3.070)**
Occupation (Employee)			
Self employed agriculture	0.063 (0.560)	-0.091 (-0.680)	-0.096 (-0.730)
Self employed other	-0.011 (-0.250)	0.116 (2.460)*	0.120 (2.610)**
Skilled worker	0.222 (2.330)*	-0.078 (-0.730)	-0.084 (-0.790)
Unskilled worker	0.130 (0.980)	0.223 (1.560)	0.224 (1.670)
Other occupation	0.053 (1.620)	0.085 (2.120)*	0.082 (2.090)*
Unemployed	-0.002 (-0.020)	-0.173 (-1.700)	-0.151 (-1.540)
Other characteristics			
Male (Female)	-0.241 (-10.340)**	-0.209 (-7.500)**	-0.169 (-6.190)**
Rural area (Urban)	0.007 (0.280)	-0.038 (-1.190)	-0.024 (-0.770)
Part time employment (Full-time)	0.042 (0.960)	-0.026 (-0.490)	-0.039 (-0.760)
Major purchases over next 12 months	0.066 (2.210)*	0.183 (5.210)**	0.161 (4.680)**
High likelihood of saving over next 12 months	-0.074 (-2.410)*	0.085 (-2.440)*	-0.071 (-2.070)*
Household that saves	-0.299 (-10.880)**	-0.180 (5.810)**	-0.124 (-4.090)**
Qualitative price perceptions (Risen a lot)			
Prices have risen moderately			-0.285 (-8.800)**
Prices have risen slightly			-0.582 (-14.590)**
Prices have stayed the same			-0.800 (-18.920)**
Prices have fallen			-0.513 (-4.860)**
Current rate of inflation			0.144 (8.440)**
Constant	1.742 (16.270)**	1.592 (20.380)**	1.929 (23.700)**
Observations	11886	7795	7795

[1] Entries show the value of the coefficient and heteroskedasticity robust t-statistics are shown in parentheses. The symbols ** and * denote statistical significance at 1% and 5% respectively.

[2] Quantitative inflation perceptions/expectations higher than 50% or lower than -20% were excluded from the analysis.

[3] The characteristic in parentheses is used as a benchmark for comparisons.

We find that the error in inflation perceptions and inflation expectations varies systematically with a number of characteristics. Consumers with secondary education and those aged 30-40 tend to make larger errors in perceived inflation. The male respondents' gap between perceived and actual inflation is by 24% smaller than females'. The occupation group of skilled workers is associated with the largest error; their deviation of perceived from actual inflation is by 22% higher than that of employees. Consumers who intend to spend more on major purchases (i.e.

furniture, electronic/electric devices, etc) over the next 12 months appear to misjudge inflation by more than those who do not plan to make big purchases. Consumers who assign a high likelihood of saving money over the next 12 months make a smaller error in forming their inflation perceptions. Additionally, the difference between perceived and actual inflation for households that save is by about 30% smaller than the gap for those who do not.

Figure 8: Estimated time effect on error between perceived/expected and actual inflation

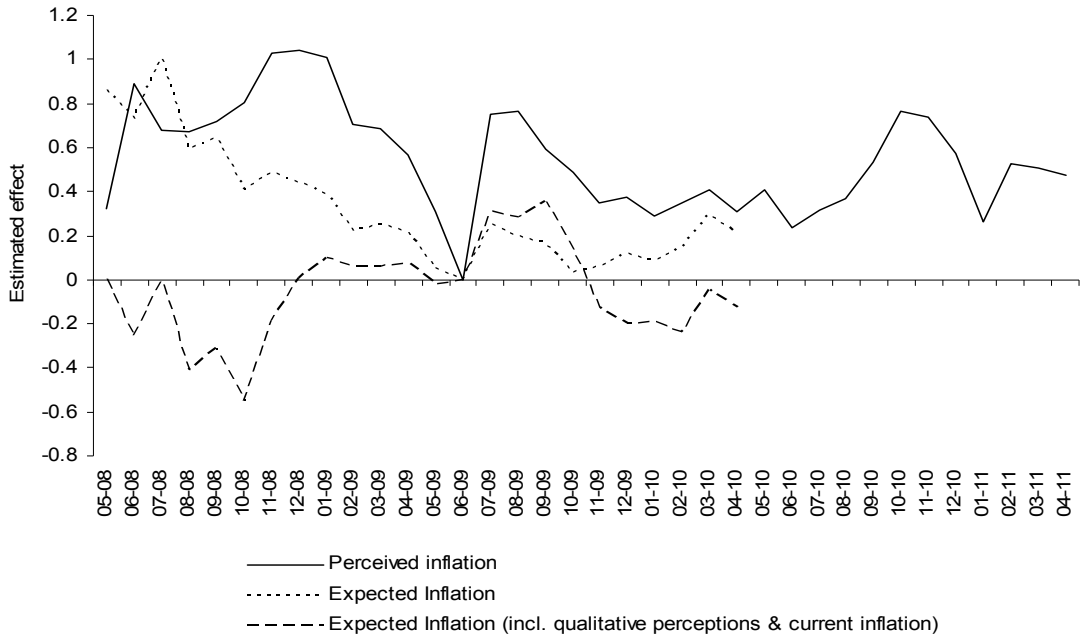


Figure 8 presents the effect of the month and year of interview on the error in perceived inflation. The largest errors were registered between November 2008 and January 2009 possibly because of the sharp increase in commodity prices including oil prices in 2008 and the extensive coverage of these events by the media. However the error appears to decrease over time.

Turning to the factors affecting the gap between consumers' expected (over the next 12 months) and realised inflation rate in the economy, results show that this gap widens for the self-employed and consumers planning to spend more on major purchases over the next 12 months, and to a lesser extend for high income households and for those in the "other" occupation group. Consumers aged 50 or over tend to make smaller errors compared to younger interviewees by as much as 14% for those aged over 64. In comparison to females, male respondents express quantitative inflation expectations that are closer to subsequently realised inflation. As in the case of perceived inflation, the high likelihood of saving, as well as the act of saving by households lowers the difference between expected and realised inflation. From Figure 8 we observe that the error in expected inflation was considerably larger in expectations referred to 12 months ahead that were reported in 2008.

The third column of Table 7 presents the factors influencing expected and realised inflation taking also into account interviewees response in the qualitative question regarding inflation perceptions, as well as the actual inflation rate at the time of the interview. The estimated coefficients of consumer characteristics are very close to those in second column. Some differences: the positive effect of high income and the negative effect of saving on consumers' gap between expected and realised inflation increases and decreases (in absolute value), respectively. Respondents who stated that price trends over the past 12 months have risen a lot hold expectations about future inflation that deviate the most from the realised figure. On the other hand, interviewees who said that prices in the last 12 months stayed about the same appear to have formed, on average, more accurate expectations compared to consumers who provided any other response option to the qualitative question. Finally current inflation rate affects positively the gap between expected and realised inflation. An increase of 1 percentage point in current inflation (e.g. from 2.5% to 3.5%) will result in 14% increase in consumer's error between expected and realised inflation most likely due to the creation of inflationary expectations and subsequent overestimation of future inflation. Conditioning on current inflation alters the effects of time dummies on inflation expectations error as seen in Figure 8. In fact the error is smaller in 2008, goes up in 2009 (when inflation was lower) and decreases again in 2010.

The findings of our microeconometric analysis hold many similarities to the findings of other studies which analyse the impact of survey participants' demographic characteristics on their opinions (expectations/perceptions) about inflation.

5. DISCUSSION AND CONCLUSIONS

This paper attempts to assess the information content of the Cyprus Consumer Survey data in relation to private consumption growth and inflation. The analysis about consumption is juxtaposed with a similar exercise for the EA. With respect to inflation, both qualitative and quantitative consumers' perceptions/expectations were explored at aggregate and micro level respectively.

Our results show that the CCI for Cyprus constructed by the EC explains a small proportion of the variation in private consumption growth but other Consumer Survey variables such as major purchases at present, perceptions about the general economic conditions and intentions to buy a car explain a considerable proportion of the consumption growth variation. Hence, an alternative consumer confidence indicator is constructed using the abovementioned variables plus unemployment expectations. The new confidence indicator produces much better results, in predicting consumption growth in Cyprus, than the CCI by EC. The inclusion of quantitative

macroeconomic variables (e.g. lags of consumption and real disposable labour income growth, stock market returns and interest rate) in consumption growth regression limits the predictive content of Consumer Survey variables. Of course, the CCIs are usually available much earlier compared to the hard macroeconomic data, and are therefore very useful for policy purposes and forecasting.

Using EA data we find that the CCI by EC explains a large percentage of the variation in the EA consumption growth. Thus this confidence indicator works well for the EA as a whole but not for Cyprus. When quantitative macroeconomic indicators are included in the model, the Consumer Survey variables, as in the case of Cyprus, contain little additional information about future consumption growth. Another finding that arises from both Cyprus and EA datasets is that in the presence of quantitative macroeconomic series in the regression, unemployment expectations appear to be associated with the highest extra information content for consumption growth of all Survey variables or confidence indictors. A similar result where unemployment expectations is a good predictor of household spending is reported for the US in Carroll (2003). The author argues that given the large share of household spending in GDP, studying unemployment expectations is a topic of interest on its own. Hence, one can construct leading indicators using this information alone, which tends to be more accurate than other parts of the survey. An investigation of unemployment expectations stated in Cyprus Business and Consumer Surveys could be the subject of future work.

The result that the information content of Consumer Survey indicators is limited for consumption growth is found in other studies for the US and a number of European counties. For example, for the US, Ludvgison (2004) finds an increment in adjusted R^2 of at most 10% when both the Michigan and Conference Board Index are included in the consumption regression in addition to the baseline macroeconomic variables. In an analysis of eight European countries Nahuis and Jensen (2004) find that the inclusion of the CCI constructed by the EC in the baseline model increases the explained variation in consumption growth by as little as 2% for the UK, Spain and Italy and as much as 14% for the Netherlands. They also find that a composite indicator that combines the consumer and retail trade confidence indicators, is a more valuable predictor in the case of Belgium, Germany, the Netherlands and Portugal. Moreover, the analysis of Al-Eyd et al. (2009) for Germany, France, Italy, the UK and the US concludes that when other determinants of consumption are taken into account the information content of consumer confidence indicators is small and therefore policy makers should use such indicators with caution when using them for short-term economic assessments. They suggest that confidence indicators could be helpful in constructing preliminary nowcasts for consumption although there are other timely available indicators that could also be used such as stock prices.

Our analysis of aggregate quantitative inflation perceptions and expectations showed that conditioning on past inflation, consumers' inflation perceptions and expectations have rather modest predictive power for inflation rate with consumer expectations performing marginally better than perceptions. Using similar models, Carroll (2003) finds that the Michigan and the Survey of Professional Forecasters Indexes together with past inflation explain 52% and 64% of the variation in the actual US inflation respectively. These figures are very close to the coefficient of determination we find for Cyprus.

The examination of consumers' quantitative inflation perceptions and expectations produced results analogous to those in other studies using European data: consumers' perceptions and expectations severely overstate actual inflation and the gap between their stated opinions and actual inflation depends on demographic and socioeconomic characteristics. In particular, the error between perceived and actual inflation is larger for those with secondary education, individuals aged 30-40, skilled workers and for those who plan to spend more on major purchases over the next 12 months. Male respondents, people who declare high likelihood of saving money in the near future and those in households that regularly save are associated with smaller error in perceived inflation. The error between expected and actual inflation is larger for the younger, the self-employed and those in "other occupation" group, those in high income households and for individuals who plan to spend more on major purchases over the next 12 months. Male and older participants, as well as those who save or have high probability of saving money in the next 12 months gauge actual inflation with a smaller error. Individuals' qualitative perceptions and current inflation rate also affect the gap between quantitative expectations and actual inflation 12 months ahead. Contrary to other studies, however we do not find a negative impact of tertiary education on the error between perceived/expected and actual inflation. It appears that in the case of Cyprus higher education attainment does not necessarily reflect a higher level of financial literacy or greater awareness of economic issues. In studying the rationality of household expectations, Carroll (2003) assumes that the media report the views of professional forecasters who may provide rational forecasts. Then each individual assimilates these macroeconomic news probabilistically so news about changes in the economy reach people with a delay. The financial reporting by the media in Cyprus is still at an embryonic stage. The tone and the way of economic news coverage might not be conducive to the formation of realistic macroeconomic perceptions and expectations.

The large overestimation of current and future inflation in European surveys in the Joint Harmonised EU Programme could be possibly due to the design of the questionnaire which allows open-ended questions but does not allow probing of extreme responses. As discussed in Biau et al. (2010) other surveys, for example the Bank of England/GfK/NOP asks consumers to choose from a predetermined ranges of price changes, while the Michigan Survey of Consumer

Attitudes instructs interviewers to probe large replies and outliers are trimmed from the distribution. Other issues in relation to the design of the Harmonised Questionnaire used in the European Consumer Surveys relates to the wording of the question which is in terms of "changes in prices in general" instead of "the inflation rate". Thus, the interpretation of the question might not be homogenous across participants and the basket of goods that each consumer considers might be different.

The results of our analysis indicate that Consumer Survey indicators have *useful* predictive content for key macroeconomic variables such as consumption growth and inflation, especially taking into account the timelessness of these series. This finding is common in studies for European countries and the US and does not cast doubt to the results of CS in Cyprus. Nevertheless, efforts should be made in the framework of EU Harmonised Consumer Surveys to elicit public inflation perceptions and expectations that are more in line with actual inflation rates. Furthermore, a more targeted survey among professional/experts about current and future macroeconomic conditions and prospects with substantial visibility would possibly yield informative outcomes about the economy, contribute to the financial literacy in Cyprus and would possibly have a positive effect on the results of the current CS.

REFERENCES

Al-Eyd, A., R. Barrel, and E. P. Davis (2009), "Consumer confidence indices and short-term forecasting of consumption", The Manchester School, 77, 96-111.

Benford, J., and R. Driver (2008), "Public attitudes to inflation and interest rates", Bank of England Quarterly Bulletin, 48, 148-156.

Biau, O., H. Dieden, G. Ferrucci, R. Friz, and S. Lindén (2010), "Consumers' quantitative inflation perceptions and expectations in the euro area: an evaluation", Paper presented at the Conference on Consumer Inflation Expectations, New York Federal Reserve Bank, NY, November 16-17, 2010.

Blanchflower, D. G., and C. MacCoille (2009), "The formation of inflation expectations: an empirical analysis for the UK", NBER Working Paper 15388.

Bram, J., and S. Ludvigson (1998), "Does consumer confidence forecast household expenditure? A sentiment index horse race", Federal Reserve Bank of New York Economic Policy Review, 4, 59-78.

Bryan, M. F., and G. Ventaku (2001), "The demographics of inflation opinion survey", Federal Reserve Bank of Cleveland Economic Commentary, October, 2001.

Carroll, C. (2003), "Macroeconomic expectations of households and professional forecasters", Quarterly Journal of Economics, 118, 269-298.

Carroll, C. D., J. C. Fuhrer, and D. W. Wilcox (1994), "Does consumer sentiment forecast consumer spending? If so, why?", The American Economic Review, 84, 1397-1408.

Cotsomitis, J., and A. Kwan (2006), "Can consumer confidence forecast household spending? Evidence from the European Commission business and consumer surveys", Southern Economic Journal, 72, 597-610.

European Commission (2007), "The joint harmonised EU programme of business and consumer surveys: User Guide", Directorate General for Economics and Financial Affairs.

Leung, C. (2009), "The demographics of household inflation perceptions and expectations", Reserve Bank of New Zealand Bulletin, 72, 34-42.

Lindén, S. (2005), "Quantified perceived and expected inflation in the euro area – How incentives improve consumers inflation forecasts", Paper presented at the joint European Commission/OECD workshop on international development of business and consumer tendency surveys, November 14-15, 2005.

Lombardelli, C., and J. Saleheen (2003), "Public expectations of UK inflation", Bank of England Quarterly Bulletin, Autumn, 281-290.

Ludvigson, S. C. (2004), “Consumer confidence and consumer spending”, Journal of Economic Perspectives, 18, 29-50.

Malgarini, M. (2007), “Quantitative inflation perceptions and expectations of Italian consumers”, Institute for Studies and Economic Analyses (ISAE), Italy.

Nahuis, N. J., and W. S. Jansen (2004), “Which survey indicators are useful for monitoring consumption? Evidence from European countries”, Journal of Forecasting, 23, 89-98.

Stock, J, H. and M. W. Watson (2003). Introduction to Econometrics. Addison-Wesley USA.

APPENDIX

Table A1: Unit root test[1]

Consumer Survey variables	Transormation[2]	t-statistic	5% critical value	Lags
Consumer Confidence Indicator	Level	-1.902	-2.972	1
Financial situation of households over last 12 months	Level	-1.940	-2.969	0
Financial situation of households over next 12 months	Level	-2.011	-2.969	0
General economic situation in Cyprus over last 12 months	Level	-1.085	-2.969	0
General economic situation in Cyprus over next 12 months	Level	-2.508	-2.969	0
Price trends over last 12 months	Level	-2.113	-2.969	0
Price trends over next 12 months[3]	Level	-3.744	-4.288[4]	1
Unemployment expectations over next 12 months	Level	-2.448	-2.969	0
Major purchases at present	Level	-1.337	-2.969	0
Major purchases over next 12 months	Level	-0.695	-2.969	0
Savings at present	Level	-2.765	-2.969	0
Savings over next 12 months	Level	-4.228	-2.972	1
Statement on financial situation of household[3]	Level	-2.076	-3.556	0
Intention to buy a car within the next 12 months	Level	-1.172	-2.969	0
Purchase or build a home within the next 12 months	Level	-2.046	-2.969	0
Home improvements over the next 12 months	Level	-1.879	-2.980	4
Confidence Indicator	First Difference	-3.276	-2.980	0
Financial situation of households over last 12 months	First Difference	-2.895	-2.986	2
Financial situation of households over next 12 months[5]	First Difference	-2.643	-1.950	0
General economic situation in Cyprus over last 12 months	First Difference	-3.122	-3.000	7
General economic situation in Cyprus over next 12 months	First Difference	-2.909	-2.625[6]	4
Price trends over last 12 months	First Difference	-4.867	-2.989	3
Price trends over next 12 months	First Difference	-4.186	2.989	3
Unemployment expectations over next 12 months	First Difference	-3.607	-2.989	3
Major purchases at present	First Difference	-3.189	-2.989	3
Major purchases over next 12 months	First Difference	-3.432	-2.989	3
Savings at present	First Difference	-3.477	-2.983	1
Savings over next 12 months	First Difference	-3.790	-2.983	1
Statement on financial situation of household[5]	First Difference	-2.550	-1.950	0
Intention to buy a car within the next 12 months	First Difference	-3.754	-2.989	3
Purchase or build a home within the next 12 months	First Difference	-3.057	-2.986	2
Home improvements over the next 12 months	First Difference	-4.954	-2.986	2

Table A1: Unit root test[1] (continued)

Quantitative variables	Transformation	Test statistic	5% critical value	Lags
Consumption[3]	Logarithm	-2.650	-3.572	4
Real disposable labour Income	Logarithm	-2.360	-2.978	3
Real Cyprus Stock Exchange Index	Logarithm	-1.746	-2.972	1
CPI[3]	Logarithm	-3.520	-3.564	2
Unemployment Rate	Level	-2.732	-2.978	3
Interest Rate (house)[3]	Level	-4.281	-4.297[4]	2
Interest Rate (personal)[3]	Level	-3.451	-3.560	1
Consumption	First Difference of Logarithm	-4.468	-2.989	3
Real disposable labour Income	First Difference of Logarithm	-3.529	-2.980	0
Real Cyprus Stock Exchange Index[5]	First Difference of Logarithm	-2.154	-1.950	6
CPI	First Difference of Logarithm	-3.031	-2.983	1
Unemployment Rate	First Difference	-3.053	-2.989	3
Interest Rate (house)	First Difference	-4.787	-2.989	3
Interest Rate (personal)	First Difference	-3.759	-2.983	1

[1] A constant term is included in the Dickey-Fuller regressions.
[2] "First Difference" indicates year-on-year changes.
[3] A time trend is included in the Dickey-Fuller regression.
[4] 1% critical value.
[5] The Dickey-Fuller regression does not include a constant term.
[6] 10% critical value.

Table A2: Correlations of CCI and its components with consumption growth[1,2]

Consumer Survey variables[3]	CCI		Financial situation of households, next 12 months		General econ. situation, next 12 months		Unempl. expectations, next 12 months		Savings, next 12 months	
Lags/Leads	CY	EA	CY	EA	CY	EA	CY	EA	CY	EA
-4	0.413*	0.581**	0.057	0.565**	0.525**	0.610**	-0.316	-0.455*	-0.043	0.366
-3	0.343	0.723**	-0.069	0.575**	0.339	0.687**	-0.482**	-0.638**	-0.108	0.402*
-2	0.375*	0.724**	-0.034	0.475**	0.184	0.613**	-0.670**	-0.755**	-0.046	0.297
-1	0.239	0.652**	-0.090	0.283	-0.040	0.486**	-0.688**	-0.794**	-0.020	0.127
0	-0.003	0.477**	-0.176	0.036	-0.265	0.272	-0.395*	-0.703**	0.178	-0.066
+1	0.087	0.231	-0.002	-0.244	-0.203	-0.010	-0.312	-0.549**	0.268	-0.303
+2	-0.057	-0.025	0.029	-0.463**	-0.323	-0.263	-0.086	-0.323	0.265	-0.468**

[1] The symbols ** and * denote statistical significance at 1% and 5% respectively.
[2] Consumption is expressed in year-on-year change of the logarithm.
[3] All Consumer Survey variables are expressed in year-on-year changes, except for "savings over next 12 months" for Cyprus.

Table A3: Correlations of Consumer Survey variables (perceptions) with consumption growth[1,2]

Consumer Survey variables[3]	Financial situation of households, last 12 months		General econ. situation, last 12 months		Major purchases at present		Savings at present	
Lags/Leads	CY	EA	CY	EA	CY	EA	CY	EA
-4	0.166	0.503	0.829**	0.585**	0.842**	0.592**	-0.012	-0.050
-3	0.071	0.557	0.632**	0.757**	0.764**	0.504**	0.030	0.121
-2	0.062	0.503	0.369*	0.818**	0.551*	0.361*	0.143	0.231
-1	0.024	0.328	0.187	0.758**	0.234	0.157	0.213	0.320
0	-0.053	0.128	0.003	0.599**	-0.095	-0.032	0.303	0.298
+1	0.107	-0.080	0.030	0.407*	-0.259	-0.279	0.376*	0.235
+2	0.118	-0.258	-0.084	0.189	-0.463**	-0.470**	0.370*	0.179

[1] The symbols ** and * denote statistical significance at 1% and 5% respectively.
[2] Consumption is expressed in year-on-year change of the logarithm.
[3] All Consumer Survey variables are expressed in year-on-year changes.

Table A4: Correlations Consumer Survey variables (expectations) with consumption growth[1,2]

Consumer Survey variables[3]	Major purchases, next 12 months		Intention to buy a car, next 12 months		Purchase or build a house, next 12 months		Home improvements, next 12 months	
Lags/Leads	CY	EA	CY	EA	CY	EA	CY	EA
-4	0.571**	0.682**	0.495*	-0.005	0.380*	0.088	0.175	0.170
-3	0.602**	0.754**	0.752**	0.086	0.445*	0.240	0.218	0.450**
-2	0.601**	0.741**	0.739**	0.062	0.315	0.206	0.288	0.413**
-1	0.517**	0.681**	0.591**	0.133	0.226	0.181	0.208	0.276
0	0.358*	0.540**	0.431*	0.068	0.064	0.098	0.232	0.353**
+1	0.184	0.335	0.151	0.011	-0.144	-0.019	0.170	-0.067
+2	-0.010	0.147	-0.060	-0.008	-0.277	-0.095	0.041	-0.241

[1] The symbols ** and * denote statistical significance at 1% and 5% respectively.
[2] Consumption is expressed in year-on-year change of the logarithm.
[3] All Consumer Survey variables are expressed in year-on-year changes, except "home improvements over the next 12 months" for EA.

Table A5: Correlations of Consumer Survey variables with inflation[1, 2]

Consumer Survey variables[3]	Change in prices, last 12 months		Change in prices, next 12 months	
Lags/Leads	CY	EA	CY	EA
-4	-0.440*	-0.241	0.376*	0.100
-3	-0.130	0.033	0.644**	0.288
-2	0.181	0.376*	0.689**	0.496**
-1	0.434	0.707**	0.537**	0.620**
0	0.692**	0.885**	0.211	0.585**
+1	0.719**	0.808**	-0.222	0.373*
+2	0.487**	0.505**	-0.459**	0.009

[1] The symbols ** and * denote statistical significance at 1% and 5% respectively.
[2] Inflation is given by the year-on-year growth rate in CPI.
[3] All Consumer Survey variables are expressed in year-on-year changes.

Table A6: Consumption growth against "informative" Consumer Survey variables

Consumer Survey variables[1,2]	Coefficient (t-statistic)[3]
General economic situation in Cyprus, last 12 months (4)	0.123 (4.000)
Unemployment expectations, next 12 months (1)	-0.126 (-2.920)
Major purchases at present (4)	0.099 (3.920)
Major purchases, next 12 months (4)	0.020 (1.300)
Intention to buy a car, next 12 months (3)	0.094 (2.340)
Adjusted R^2	0.916

1 All Consumer Survey variables are expressed in year-on-year changes.

2 The number in the parentheses next to the variable name indicates which lag of the variable is included in the regression.

3 Standard errors and therefore test statistics shown are corrected for first order error autocorrelation.

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