



## Economic Analysis Papers

### AN ASSESSMENT OF BUSINESS AND CONSUMER SURVEY DATA FOR CYPRUS

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# AN ASSESSMENT OF BUSINESS AND CONSUMER SURVEY DATA FOR CYPRUS<sup>1</sup>

N. Pashourtidou and A. Tsiaklis

## **Abstract**

*The purpose of this study is to assess the information content of BCS data for Cyprus at a micro as well as at an aggregate level, using statistical and econometric analysis. The examination at a micro level aims at analysing the consistency of consumers' and firms' responses by comparing their expectations stated in a given month with the realisations either reported by the same participants in the surveys or published in official statistics. In addition, we investigate how the probability of survey participants to provide correct predictions (i.e. expectations that are in agreement with realisations) relates to firm and consumer characteristics. At an aggregate level, we investigate which BCS variables/indicators are more suitable in modelling economic variables relating to particular sectors of the Cyprus economy.*

*Micro analysis showed that the majority of firms in services, industry and construction provided correct predictions about their future economic activity. Employment expectations of firms in services were realised for over 75% of the respondents, while in construction a considerable proportion of firms overpredicted their future employment levels. The results of the micro analysis relating to consumers are rather disappointing as the proportion of interviewees that provided correct predictions about future developments in the economy is quite low. At an aggregate level the results showed that sectoral confidence indicators contain significant leading information about quantitative sectoral activity variables. Firms' employment expectations are useful leading indicators for the number of registered unemployed in each sector and firms' selling price expectations are informative about inflation in retail trade and manufacturing production goods, as well as for inflation in main construction materials.*

*The analysis revealed that business survey data can constitute a valuable tool to policy-makers for monitoring economic developments and for the timely planning of economic policies. Firms can also utilise the information in business survey data for purposes of financial planning and decision-making. Furthermore, it appears that business and consumer data can be a useful input in the construction of short-term forecasts for macroeconomic variables in Cyprus.*

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## **ΑΞΙΟΛΟΓΗΣΗ ΤΩΝ ΣΤΟΙΧΕΙΩΝ ΕΡΕΥΝΩΝ ΟΙΚΟΝΟΜΙΚΗΣ ΣΥΓΚΥΡΙΑΣ ΤΗΣ ΚΥΠΡΟΥ**

### **ΠΕΡΙΛΗΨΗ**

Σκοπός της μελέτης είναι η αξιολόγηση των πληροφοριών που περιέχονται στις Έρευνες Οικονομικής Συγκυρίας (ΕΟΣ) που διεξάγονται στην Κύπρο, με τη χρήση ατομικών στοιχείων επιχειρήσεων/καταναλωτών, καθώς και με συνολικά στοιχεία για τομείς της οικονομίας. Η ανάλυση των ατομικών στοιχείων στοχεύει στη διερεύνηση της συνέπειας των απαντήσεων των καταναλωτών και επιχειρήσεων μέσω σύγκρισης των προσδοκιών που εκφράστηκαν σε συγκεκριμένο μήνα με τις πραγματοποιήσεις που είτε δηλώθηκαν από τους ίδιους σε μεταγενέστερο στάδιο είτε δημοσιεύθηκαν ως επίσημα στοιχεία από τη Στατιστική Υπηρεσία. Εξετάζεται, επίσης, πώς η πιθανότητα να δώσει κάποιος ερωτούμενος ορθή πρόβλεψη (δηλαδή οι προσδοκίες να συμφωνούν με τις πραγματοποιήσεις) εξαρτάται από χαρακτηριστικά των επιχειρήσεων και των καταναλωτών. Σε συνολικό επίπεδο, διερευνάται η καταλληλότητα των διαφόρων μεταβλητών/δεικτών των ΕΟΣ στη μοντελοποίηση οικονομικών μεταβλητών που σχετίζονται με διάφορους τομείς της κυπριακής οικονομίας.

Η ανάλυση των ατομικών στοιχείων έδειξε ότι, στην πλειοψηφία τους, οι επιχειρήσεις στις υπηρεσίες, μεταποίηση και κατασκευές δίνουν ορθές προβλέψεις για τη μελλοντική οικονομική τους δραστηριότητα. Οι προσδοκίες των επιχειρήσεων στις υπηρεσίες για την απασχόληση επιβεβαιώθηκαν για πέραν του 75% των ερωτούμενων, ενώ στις κατασκευές ένα σημαντικό ποσοστό υπερεκτίμησε το επίπεδο της απασχόλησης του. Τα αποτελέσματα της ανάλυσης ατομικών στοιχείων των καταναλωτών είναι μάλλον απογοητευτικά, αφού το ποσοστό των ερωτούμενων που έδωσε σωστές προβλέψεις για μελλοντικές εξελίξεις στην οικονομία ήταν αρκετά χαμηλό. Σε συνολικό επίπεδο, τα αποτελέσματα έδειξαν ότι οι δείκτες επιχειρηματικού κλίματος των ΕΟΣ περιέχουν σημαντικές προπορευόμενες πληροφορίες για ποσοτικές μεταβλητές της οικονομικής δραστηριότητας τομέων της οικονομίας. Οι προσδοκίες των επιχειρήσεων για την απασχόληση αποτελούν χρήσιμους προπορευόμενους δείκτες για τον αριθμό των εγγεγραμμένων ανέργων σε διάφορους τομείς, ενώ οι προσδοκίες τους για τις τιμές πώλησης προδιαγράφουν μελλοντικές τάσεις στον πληθωρισμό προϊόντων λιανικού εμπορίου και μεταποίησης, καθώς και στον πληθωρισμό βασικών κατασκευαστικών υλικών.

Η ανάλυση έδειξε ότι τα στοιχεία των ΕΟΣ των επιχειρήσεων αποτελούν χρήσιμο εργαλείο για την παρακολούθηση των εξελίξεων στην οικονομία και την έγκαιρη λήψη μέτρων οικονομικής πολιτικής. Οι πληροφορίες στις ΕΟΣ θα μπορούσαν επίσης να αξιοποιηθούν από επιχειρήσεις για σκοπούς οικονομικού προγραμματισμού. Επιπρόσθετα, φαίνεται ότι τα στοιχεία αυτά θα μπορούσαν να χρησιμοποιηθούν στην κατασκευή βραχυπρόθεσμων προβλέψεων για διάφορες μακροοικονομικές μεταβλητές της κυπριακής οικονομίας.



## 1. INTRODUCTION

Business and Consumer Survey (BCS) data are known to contain information regarding firm's perceptions and expectations about various economic variables relating to their business, such as economic activity/output, employment, prices, etc. The surveys include a number of questions for each one of the key sectors of the economy: retail trade, construction, industry, services. The surveys also provide valuable information on consumers' perceptions regarding the financial condition of their households and several other aspects of the economy. The usefulness of BCS data lies in the timeliness of the information they contain about different macroeconomic variables, since they are released at the end of each reference month.

BCS data are used to calculate a set of monthly confidence indicators that capture the economic conditions in each of the sectors and among consumers. Moreover, an aggregate Economic Sentiment Indicator (ESI) is constructed in order to describe the overall economic climate in each country.<sup>2</sup> These composite indicators are found to be useful leading indicators for economic activity and therefore can be used as a tool for monitoring the economy, as well as for short-term forecasting.

Because of the importance of BCS data, the European Commission carries out monthly harmonised surveys in EU member states and a number of candidate countries. Since May 2008, the Economics Research Centre, in collaboration with RAI Consultants Public Ltd, has been conducting the BCS in Cyprus (as part of the Joint Harmonised European Union Programme of Business and Consumer Surveys).

There are many studies which find that BCS data contain useful information in forecasting aggregate economic activity in European economies (e.g. Banbura and Runstler 2007 and Claveria et al. 2007 for the euro area; Hansson et al. 2005 for Sweden; Taylor and McNabb 2007 for the UK, France, Italy and the Netherlands). There has also been a large number of works, mainly by the European Commission and institutes that conduct the BCS in European countries, that investigate the information content of these data not only for predicting economic activity but also in leading the developments in employment and prices/inflation in different sectors. Moreover, research in these institutes dealt with the construction of alternative BCS indicators with the aim of finding optimal indicators for different aspects of the economy (sectors or aggregate variables) that combine the replies to the BCS questions with the largest information content. The Economics Research Centre as an institute that carries out these

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<sup>2</sup> More details on the methodology of BCS, the questionnaires and the construction of indicators can be found in the User Guide for The Joint Harmonised EU Programme of Business and Consumer Surveys, published by the European Commission

[http://ec.europa.eu/economy\\_finance/indicators/business\\_consumer\\_surveys/userguide\\_en.pdf](http://ec.europa.eu/economy_finance/indicators/business_consumer_surveys/userguide_en.pdf)

surveys is also conducting research both at aggregate and disaggregate level to evaluate the usefulness of BCS data collected in Cyprus in explaining movements in economic activity, employment and inflation. The consistency of the replies provided at the surveys is also investigated to check whether expectations reported in a given month match realisations registered in the following months or realisations reflected in published official statistics.

Below we survey some of the works by the European Commission and some institutes carrying out BCS in European countries.

Jonsson (2007) focused on assessing managers' employment expectations for the euro area. His results showed that survey data are useful in predicting actual employment growth in the sense of reduced forecast errors. Nevertheless, the size of the gains from including employment expectations is generally modest. Moreover, his forecasting exercise suggested that both the confidence indicators and employment expectations alone perform equally well.

Friz (2008) used aggregate data for the EU and the euro area, as well as data for large EU economies (Germany, Spain, France, Italy, the Netherlands, Poland and UK) in order to examine the reliability of manager's selling price expectations as leading indicators of producer price index (PPI) for the manufacturing sector. The graphical representation and the correlation coefficient analysis indicate a co-movement of the two series. Thus, managers' selling price expectations in the manufacturing sector could help to recognize inflationary pressures at the earlier stages of the production chain. These results were supported by Granger-causality tests which showed that the price expectations can significantly contribute to the explanation of producer prices.

Malgarini (2007) used the monthly quantitative inflation perceptions and expectations of Italian consumers, for the period between September 2003 and June 2007, and found that Italian consumers have largely overestimated inflation developments. Moreover, he found that inflation opinions are strongly influenced by the socio-demographic characteristics of the consumers, as well as by their assessments and expectations on their own economic situation and that of the country. Specifically, pessimistic consumers tend generally to overestimate inflation more than the optimistic ones.

One of the questions in the consumer harmonized questionnaire asks whether the household is able to save (a little or more), just manage to meet the budget, needs to withdraw from savings or make debts in order to face ordinary expenditures. Malgarini and Margani (2009) attempted to measure the degree of financial distress of European households by summing the relative frequencies of those who have to borrow or draw on their reserves to meet their current needs. The cumulated frequency may be interpreted as an indicator of "financial distress" i.e. being

incapable of sustaining the current standard of living. Using data for five countries (Italy, France, UK, Spain and Portugal) for the period 1995-2000, they showed that the financial distress is at its highest during the current recession in all the countries considered. Furthermore, for all of the countries, the financial distress indicator reaches a peak during or immediately before the current recession. Finally, the share of consumers being in a situation of distress is heterogenous both among countries and within countries. Even though Malgarini and Margani (2009) provided interesting preliminary evidence concerning the impact that the recession has on the household's financial situation, the results are merely descriptive and should not be interpreted as possible evidence of causal relationships.

The current consumer confidence indicator (CCI) is based on answers from two macro-based (economy-related) questions and two micro-based (household-related) questions. However, for both EU and the euro area aggregate, the correlation between the CCI and actual consumption growth appears to be somewhat low. Jonsson and Lindén (2008) constructed different consumer confidence indicators i.e. combination of the questions included in the consumer questionnaires, in an attempt to find the single indicator that has the highest correlation with private consumption growth in EU and the euro area. Furthermore, this indicator was compared to the existing CCI and some other indicators, in order to check their predictive power for private consumption. Since respondents to the consumer surveys have better knowledge of their own economic situation than they have of the general economic situation in their country, Jonsson and Lindén (2008) hypothesized that an indicator based on questions related to household only would prove to be more informative. Their empirical results indicate that the micro indicator outperforms the current CCI. However, their hypothesis of the superiority of the micro questions was not confirmed, since the optimal indicator in both EU and the euro area appears to include both micro and macro questions in addition to those included in the CCI.

Cornec and Deperraz (2005) constructed a synthetic monthly indicator of the business climate in the French service sector. The methodological analysis of dynamic factor models is used in order to extract the services synthetic indicator. This indicator provides an easier interpretation of the survey's results. Additionally, the services indicator provides a better insight of the underlying economic trend of the service sector as it can be obtained at a disaggregated level i.e. is broken down into the three sub sectors of the services domain: business activities, personal activities and real estate activities. All in all, the analysis showed that the synthetic indicator confirmed the recovery of activity in the services sector in France since mid-2003.

Goggin (2008) provided a preliminary assessment of the usefulness of BCS data for short-term macroeconomic forecasting in Ireland. His analysis focused on output and employment, and consists of checking the internal and external consistency of the survey data. The internal consistency of the survey data tests the extent to which the expectations expressed by

respondents in previous months forecast the results of the reported outcomes. External consistency testing involves comparing the survey variables to their official data equivalents. The rationale for performing internal and external consistency tests is the following: if the reported survey outcomes from one month correspond to expectations data from previous month, and the outcome survey variable is subsequently found to be consistent with the equivalent official series, then the survey expectation variable is useful for short-term forecasting purposes. Goggin (2008) used BCS data as well as official series from the Central Statistics Office, from February 1996 until March 2007. The results of his analysis are mixed with the main conclusion being that the vast majority of the survey variables have little or no predictive power in the case of Ireland.

Relatively recently, a preliminary analysis by Kontolemis et al. (2010) evaluates the usefulness of BCS data for Cyprus. The graphical representations together with an econometric analysis showed that there is a strong link between the ESI and the GDP growth in Cyprus and in particular the changes in the ESI lead the developments in output growth. Furthermore, the economic crisis that affected Cyprus in the last quarter of 2008 and in 2009 was captured by the BCS data. This is an indication that the BCS data provide useful information about the developments in the Cyprus economy. Nonetheless, an examination at a greater depth of more disaggregate BCS data is required to evaluate further the quality of these data.

The purpose of this study is to assess the information content of BCS data for Cyprus at a micro (individual firms and consumers) and an aggregate (sectors of the economy) level, using statistical and econometric analysis. The examination at a micro level aims at analysing the consistency of the consumers' and firms' responses by comparing their expectations stated in a given month with the realisations either reported by the same participants in the surveys or published in official quantitative economic data. In addition, we investigate how the probability of survey participants to provide correct predictions (i.e. expectations that are in agreement with realisations) relates to firm- and consumer-specific characteristics. At an aggregate level, we evaluate the association between sectoral confidence indicators, as well as individual survey variables, with published relevant quantitative economic series, using an econometric analysis. We investigate which BCS variables/indicators are more suitable in modelling economic variables relating to particular sectors of the Cyprus economy.

The rest of the paper is structured as follows. Section 2 describes the data. Section 3 presents the results of the analysis at a micro level and section 4 provides the results of sectoral data analysis. Section 5 concludes.

## 2. DATA

We use monthly data obtained from BCS. Individual/micro (firm or consumer) data cover the period May 2008 – April 2010. Aggregate survey data employed for services, retail trade and construction span the period May 2002 – April 2010 and aggregate survey data for industry refer to a longer period, namely May 2001 – April 2010. In the business surveys, firms are asked to assess the recent trends in production, orders and stock of finished products (industry), the business activity in the past three months (construction, retail trade and services), their order books (construction), stocks (retail trade), turnover and employment (services), as well as to state their expectations about production (industry), business activities (construction, retail trade and services), orders to suppliers (retail trade), turnover (services), selling prices and employment.<sup>3</sup> In the case of consumer survey interviewees 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 make major purchases in the short-run.<sup>4</sup> Individual data therefore, are in the form of qualitative responses and aggregate (sectoral) data are given by the percentages of firms/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 positive from negative responses. These balances are employed in the calculation of the monthly confidence indicators.

The evaluation of the quality of survey data requires comparisons with relevant quantitative economic series published by the Statistical Service. Thus, we use monthly data (covering the same period as the relevant BCS variables) on officially published variables such as the Consumer Price Index (CPI), price indices for different sectors, the number of registered unemployed, the turnover index of hotels and restaurants, the turnover index in transport, storage and communication, the value index of retail trade, the volume index of manufacturing production, local sales of cement, etc. Quarterly data on GDP were also used in the analysis.<sup>5</sup>

In order to examine visually whether firms' expectations are consistent with their future responses over time we plot, on Figures 1 and 2, the net balances of specific questions, from August 2008 until April 2010. In particular, for each month we compare firms' expectations concerning their economic activity and employment, expressed three months ago, to the firms' realisations stated that month. Following this graphical approach, we can see that, in all sectors

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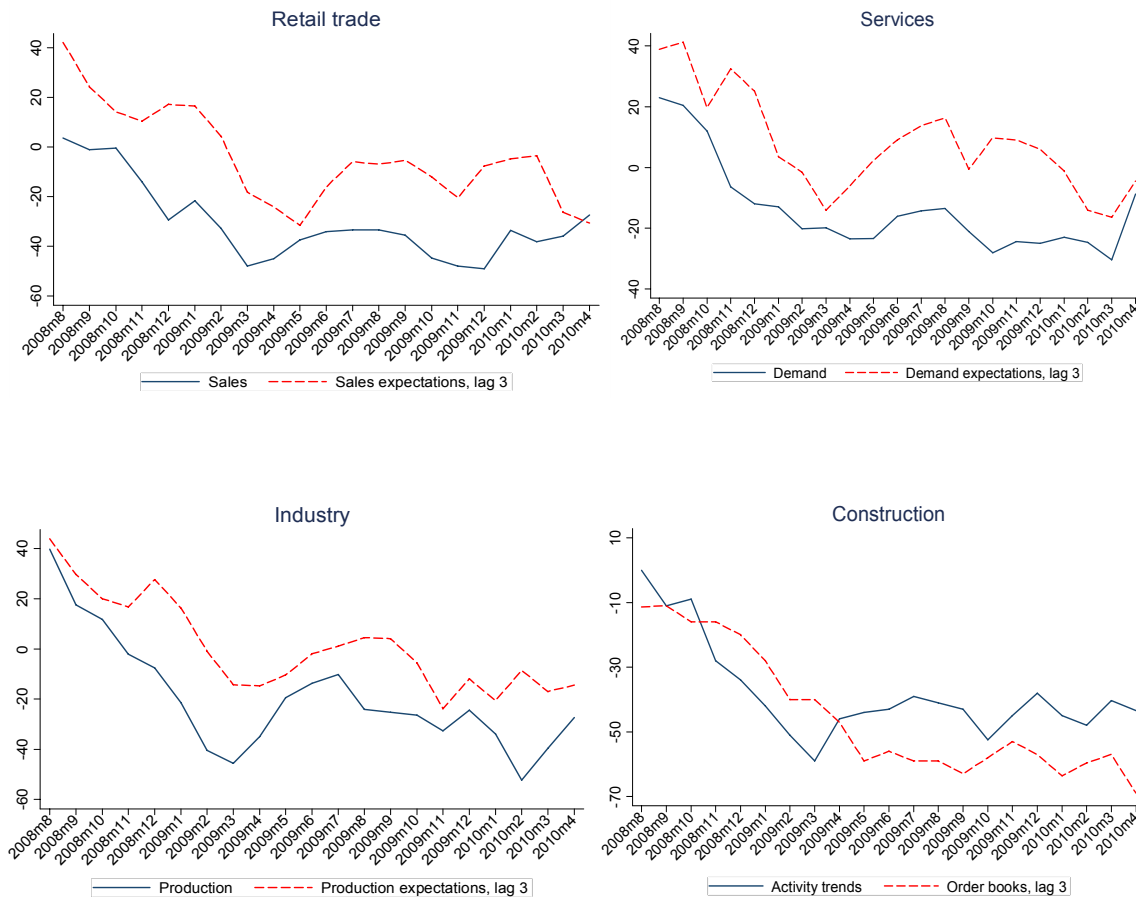
<sup>3</sup> For the business surveys, answers are given according to a three-option ordinal scale: "increase" (+), "remain unchanged" (=), "decrease" (-); or "more than sufficient" (+), "sufficient" (=), "not sufficient" (-); or "too large" (+), "adequate" (=), "too small" (-).

<sup>4</sup> For the consumer survey, the answers are given according to a five-option ordinal scale such as: "got a lot better" (++), "got a little better" (+), "stayed the same" (=), "got a little worse" (-), "got a lot worse" (--).

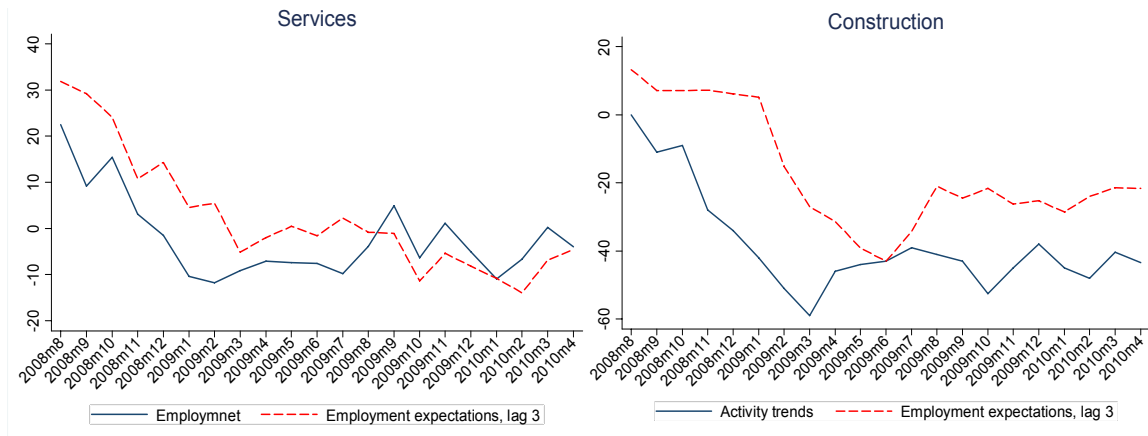
<sup>5</sup> Quantitative economic series were obtained from the website of the Statistical Service of the Republic of Cyprus.

expectations expressed in a given month about activity/employment in the next three months, move together with actual outcomes reported three months later. In retail trade, services and industry firms on average tend to over-predict their economic activity i.e. expected higher sales/demand/production than the actual outcome they observe three months later. In construction, expectations and realisations about order books move closer together, with the respondents being more optimistic during the last months of 2008 and the early months of 2009 and rather pessimistic since May 2009 onwards. Employment expectations appear to be in greater agreement with realisations in the services sector rather than in construction, where firms, most of the time tend to overestimate their number of employees.

**Figure 1: Expectations vs. realisations: economic activity**



**Figure 2: Expectations vs. realisations: employment**



### 3. MICRO DATA ANALYSIS

#### 3.1 Firms

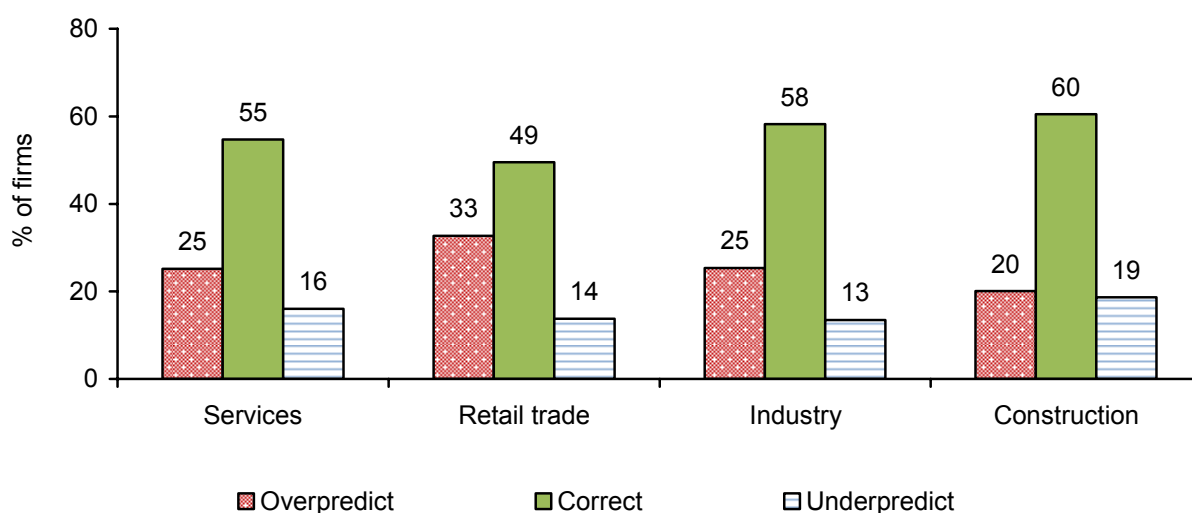
In this section, we conduct a more detailed micro analysis of individual firm data to compute the percentages of firms that offered correct predictions, i.e. their expectations matched their realisations. In particular, we use a panel of firms that took part in all monthly business surveys in Cyprus, for the period May 2008 to April 2010, in order to examine whether expectations stated in a particular month are consistent with realisations registered by the surveys in following months. Our analysis focuses on economic activity variables (i.e. demand in services, sales in retail trade, production in manufacturing and order books in construction) and employment. In most cases, respondents are asked one question regarding actual outcomes over the past three months, and one question regarding expectations over the next three months.<sup>6</sup> Thus, we compare the responses concerning outcomes in a particular month (e.g. August 2008) to expectations expressed by respondents three months ago (e.g. May 2008). This comparison can reveal the extent to which expectations stated by respondents are realised, or, in other words, how accurately they can predict their future economic activity and employment.

Figure 3 presents the percentage of firms that predicted correctly, overestimated or underestimated their economic activity. By correct prediction we mean that the expectations expressed by a firm in a given month about its economic activity in the next three months,

<sup>6</sup> The survey in the construction sector does not ask directly about expected economic activity. Thus, we compare the responses about current activity trends (realisations) with those about the order books since the latter incorporate expectations. Furthermore, the construction survey includes a question about expected employment but does not include a question on current employment, thus we use again the activity trends as realisations since construction is a labour intensive sector.

matched the realisation stated by the same firm three months later. For example, a firm in the services sector interviewed in May reported an expected increase in demand in the next three months and the same firm when surveyed again in August stated that its demand in the last three months increased. By overestimation (underestimation) we mean that the expected change in activity reported by the respondent was higher (lower) than the actual change in activity stated by the same respondent three months later.<sup>7</sup> With the exception of the retail trade sector, for more than half of the cases considered expectations were found to be consistent with realisations. However, significant percentages (20% - 33%) overestimated their economic activity, while smaller percentages (13% - 19%) expected lower demand, sales, production or order books than their actual outcomes. Therefore, as far as future economic activity is concerned, firms tend to be rather optimistic than pessimistic.

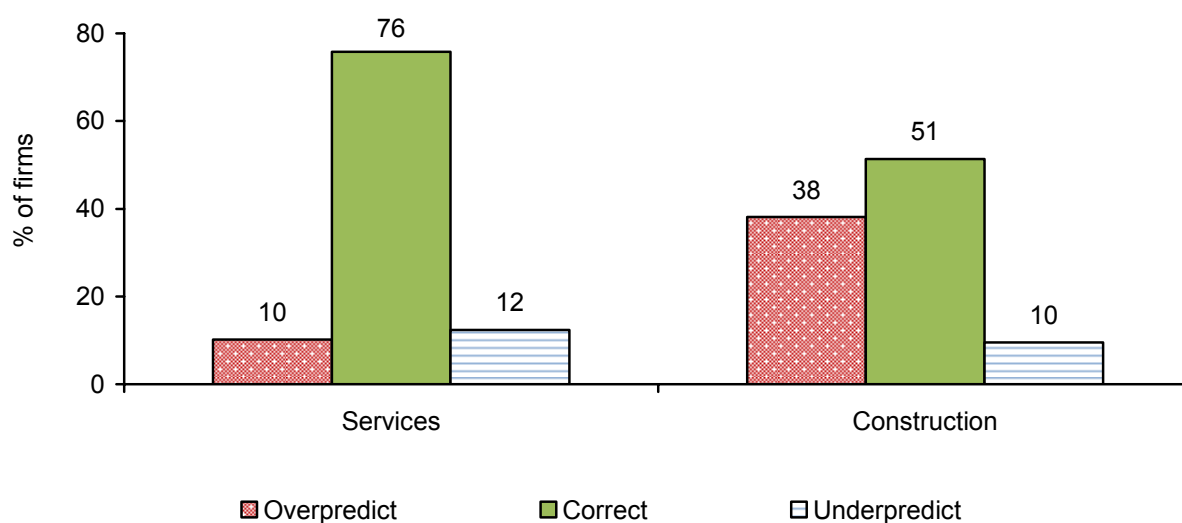
**Figure 3: Percentage of firms that provided correct (incorrect) predictions: economic activity**



The percentage of firms in services and construction that conjectured accurately or overestimated/underestimated the change in their employment is shown in Figure 4. In services, there is a quite high proportion of correct predictions (76%). As far as the construction sector is concerned, even though for half of the companies expectations matched realisations, a significant proportion (38%) overestimated the change in the number of employees, since in the realisations registered by the survey employment remained either unchanged (instead of higher as expressed in expectations) or decreased (instead of unchanged or higher as reported in expectations). In both services and construction, the vast majority of firms that predicted correctly the change in their employment are those that did not expect any changes in the number of their employees (Table A1, Appendix).

<sup>7</sup> For details, see Table A1 in the Appendix.

**Figure 4: Percentage of firms that provided correct (incorrect) predictions: employment**



Looking at the proportion of correct predictions by month, we do not observe any particular pattern e.g. seasonality, in any of the sectors.<sup>8</sup> In almost all months, the highest proportion of correct predictions refers to firms that conjectured correctly that their sales, production, order books, demand or employment would remain unchanged.

Furthermore, we estimated probit models to examine the effects of various firm-specific characteristics on the probability firms' expectations match their future realisations about economic activity and employment. The dependent variables are binary i.e. they take the value 1 if the firm's expected change in activity/employment in the next three months, stated in month  $t$  (e.g. May), agree with firm's changes in activity/employment in the last three months reported in month  $t+3$  (e.g. August) and 0 otherwise. Tables 1 and 2 show the estimated marginal effects for activity and employment respectively. The independent variables include firm's years of operation, firm size, legal entity, district, type of interview and subsector of activity. We also use time dummy variables that capture potential heterogeneity between the different three-month periods for which expectations are expressed and realisations are registered, as well as between the different years of surveys.

<sup>8</sup> Results by month are available upon request.

**Table 1: Estimated marginal effects, economic activity<sup>1</sup>**

	Demand (Services)	Sales (Retail trade)	Production (Industry)	Order Books (Construction)
Firm size (1-9) <sup>2</sup>				
10-49	0.070 (1.666)*	-0.017 (-0.503)	0.196 (2.331)**	0.159 (1.725)*
50-249	0.152 (-2.882)***	0.104 (1.907)*	-0.089 (-0.738)	0.087 (0.642)
250+	0.105 (1.554)	-	-0.180 (-0.801)	-0.084 (-0.578)
Years of operation	-0.001 (-0.419)	-0.002* (-1.786)	-0.001 (-0.303)	0.004 (1.381)
Legal form (Ltd) <sup>2</sup>				
Private Firm	0.046 (0.855)	0.068 (1.690)*	0.115 (0.758)	0.224 (2.706)***
Partnership	0.144 (2.351)**	-0.085 (-0.803)	0.155 (0.962)	0.071 (0.657)
District (Nicosia) <sup>2</sup>				
Limassol	-0.008 (-0.154)	0.050 (1.478)	0.003 (0.032)	-0.127 (-0.976)
Larnaca	0.050 (0.695)	-0.007 (-0.151)	-0.081 (-0.850)	-0.200 (-1.809)*
Famagusta	0.101 (1.075)	-0.148 (-1.219)	-	-
Pafos	-0.004 (-0.0654)	0.145 (1.730)*	0.166 (1.297)	-0.119 (-1.130)
Interview type (Phone) <sup>2</sup>				
Fax	-0.022 (-0.453)	0.033 (0.613)	-0.011 (-0.191)	-0.261 (-2.044)**
Email	0.157 (2.918)***	-0.108 (-1.493)	0.208 (1.509)	0.102 (1.169)
Subsector				
Real estate (Hotels & Restaurants) <sup>2</sup>	-0.003 (-0.025)			
Transport & travel agencies	-0.143 (-2.502)**			
Financial Intermediation etc.	0.105 (1.446)			
Education & health	0.050 (0.824)			
Other services activities	-0.201 (-4.135)***			
Motor vehicles (Food, drink, tobacco) <sup>2</sup>		0.119 (1.634)		
Textile, clothing, footwear		-0.014 (-0.194)		
Household goods electricity		-0.006 (-0.069)		
Household goods other		0.059 (0.711)		
Large multiple shops		0.068 (0.991)		
Remaining		0.112 (1.727)*		
Investment goods (Non-durable consumer goods) <sup>2</sup>			-	
Intermediate goods			0.034 (0.493)	
Durable consumer goods			-0.031 (-0.220)	
Electricity & plumbing (General construction) <sup>2</sup>				-0.111 (-0.987)
Painting etc.				0.003 (0.024)
Motorways etc.				0.191 (1.370)
Other construction work				0.229 (2.586)***
Time period (05/08-08/08) <sup>2</sup>				
06/08-09/08	0.168 (1.813)*	0.018 (0.229)	0.122 (0.844)	0.069 (0.464)
07/08-10/08	0.083 (0.864)	-0.019 (-0.235)	-0.003 (-0.020)	0.068 (0.457)
08/08-11/08	0.053 (0.550)	-0.067 (-0.825)	-0.021 (-0.137)	0.070 (0.474)
09/08-12/08	0.100 (1.043)	0.003 (0.035)	-0.194 (-1.301)	0.072 (0.487)
10/08-01/09	0.121 (1.259)	-0.010 (-0.118)	-0.094 (-0.610)	0.113 (0.777)
11/08-02/09	0.107 (1.128)	0.047 (0.596)	0.026 (0.174)	0.224 (1.649)*
12/08-03/09	0.187 (2.081)**	0.089 (1.134)	0.077 (0.541)	0.108 (0.727)
01/09-04/09	0.173 (1.794)*	-0.025 (-0.316)	0.075 (0.515)	0.149 (1.037)
02/09-05/09	0.045 (0.458)	0.080 (1.002)	0.168 (1.215)	0.031 (0.204)
03/09-06/09	0.144 (1.546)	0.156 (1.991)**	0.166 (1.192)	0.112 (0.769)
04/09-07/09	0.156 (1.704)*	0.024 (0.301)	0.117 (0.803)	0.235 (1.853)*
05/09-08/09	0.219 (2.425)**	0.094 (1.199)	0.007 (0.048)	0.116 (0.819)
06/09-09/09	0.084 (0.861)	0.033 (0.410)	0.119 (0.821)	0.070 (0.484)
07/09-10/09	0.096 (0.988)	0.053 (0.660)	0.253 (1.826)*	0.164 (1.154)
08/09-11/09	0.026 (0.268)	0.047 (0.584)	-0.001 (-0.002)	0.154 (1.113)
09/09-12/09	0.118 (1.259)	-0.015 (-0.181)	0.121 (0.838)	0.189 (1.360)
10/09-01/10	0.115 (1.198)	0.100 (1.221)	-0.189 (-1.219)	0.021 (0.134)
11/09-02/10	0.027 (0.269)	0.098 (1.249)	0.124 (0.877)	0.072 (0.485)
12/09-03/10	-0.095 (-0.907)	0.018 (0.226)	0.134 (0.945)	0.094 (0.643)
01/10-04/10	0.033 (0.330)	0.041 (0.523)	0.122 (0.855)	0.189 (1.368)
Number of observations	1066	1652	448	479

Notes: <sup>1</sup> Robust t-statistics are provided in parentheses. The symbols \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% respectively.

<sup>2</sup> Denotes the group with which comparisons are made.

The probability that a firm's expected level of activity matches the realised activity level is higher for larger firms in services and retail trade but the opposite is true for firms in industry and construction. The years of operation seem to slightly adversely affect the probability of correct prediction in retail trade. Private firms in construction and retail trade have a better chance of having their stated expectations realised than firms of other legal forms in the corresponding sectors, while partnerships in the services sector are associated with higher probability of correct predictions than private and limited companies. The type of interview appears to be connected with the firm's ability to state expectations about activity that are consistent with realisations. In particular, firms in services that answer via email are more likely than firms that respond by fax or phone to provide correct predictions about their demand. Firms in construction predict less accurately when they reply by fax. We also observe some variation in the probability of correct predictions within sectors. In services, this probability is the lowest for transportation, travel agencies and other services activities. In retail trade, firms in the "remaining" subsector have a better chance of expressing expectations about sales that are in agreement with realisations reported three months later. The highest probability of providing correct predictions in construction is associated with firms in the "other construction works" subsector. We observe little variation between time periods pairing expectations and realisations; no particular pattern, e.g. seasonality, is detected.

As far as employment is concerned, larger firms (between 50 and 249 employees) in both services and construction are the least likely to give correct predictions about employment, while smaller firms (between 10 and 49 employees) in construction are the most likely. Moreover, in services and construction the years of operation of the firm impact negatively on the firm's ability to express employment expectations that are consistent with realisations. Private firms and partnerships in services have a better chance of providing correct predictions about their number of employees than limited companies. On the other hand, in construction limited companies seem to give the most accurate predictions. The district where a firm is located influences the probability of correct prediction in both services and construction sectors. For services, the probability that expectations about the number of employees match realisations is the lowest for firms in the Famagusta and Pafos districts. The aforementioned probability is the highest for construction firms in the Nicosia district. Regarding subsectors, firms in the broader financial intermediation, as well as in education and health services subsectors are the most likely to have their stated expectations about employment realised. Firms in the construction subsector relating to painting are the least likely to provide accurate predictions about their employment levels. Finally, in services firms' expectations reported in

July and in late autumn/early winter months have a better chance of being consistent with realisations.

**Table 2: Estimated marginal effects, employment<sup>1</sup>**

	Employment (Services)	Employment (Construction)
Number of employees(1-9) <sup>2</sup>		
10-49	-0.144 (-3.86 4)***	0.279 (2.839)***
50-249	-0.316 (-6.608)***	-0.070 (-0.492)
250+	-0.064 (-1.042)	0.191 (1.269)
Years of operation	-0.004 (-4.351)***	-0.005 (-1.699)*
Legal form (Ltd) <sup>2</sup>		
Private	0.122 (3.161)***	-0.180 (-1.948)*
Partnership	0.120 (2.505)**	-0.171 (-1.452)
District (Nicosia) <sup>2</sup>		
Limassol	0.071 (1.979)**	-0.117 (-0.918)
Larnaca	-0.026 (-0.458)	-0.294 (-2.847)***
Famagusta	-0.183 (-2.292)**	
Pafos	-0.129 (-2.651)***	-0.423 (-4.357)***
Interview type (Phone) <sup>2</sup>		
Fax	-0.025 (-0.677)	-0.193 (-1.584)
Email	-0.048 (-1.072)	-0.152 (-1.576)
Subsector		
Education & Health (Hotels & Restaurants) <sup>2</sup>	0.147 (3.487)***	
Transport & Travel Agencies	0.012 (0.296)	
Financial Intermediation etc.	0.132 (3.187)***	
Other Services Activities	-0.008 (-0.224)	
Electricity & Plumbing (General construction) <sup>2</sup>		-0.174 (-1.530)
Painting etc.		-0.247 (-2.350)**
Motorways etc.		-0.112 (-0.674)
Other Construction Work		-0.012 (-0.118)
Time period (05/08-08/08) <sup>2</sup>		
06/08-09/08	0.074 (1.087)	0.093 (0.569)
07/08-10/08	0.154 (2.625)***	-0.154 (-0.960)
08/08-11/08	0.057 (0.820)	-0.012 (-0.076)
09/08-12/08	0.060 (0.860)	0.084 (0.532)
10/08-01/09	0.088 (1.328)	0.060 (0.338)
11/08-02/09	0.141 (2.511)**	-0.012 (-0.078)
12/08-03/09	0.131 (2.125)**	-0.019 (-0.119)
01/09-04/09	0.013 (0.187)	0.225 (1.470)
02/09-05/09	0.101 (1.563)	0.037 (0.231)
03/09-06/09	0.022 (0.296)	-0.010 (-0.062)
04/09-07/09	0.059 (0.850)	0.182 (1.182)
05/09-08/09	0.047 (0.674)	0.088 (0.547)
06/09-09/09	0.126 (2.103)**	-0.111 (-0.698)
07/09-10/09	0.128 (2.028)**	-0.054 (-0.333)
08/09-11/09	0.020 (0.277)	0.132 (0.856)
09/09-12/09	0.055 (0.778)	-0.012 (-0.076)
10/09-01/10	0.147 (2.551)**	0.124 (0.793)
11/09-02/10	0.108 (1.683)*	-0.111 (-0.684)
12/09-03/10	0.140 (2.468)**	0.018 (0.118)
01/10-04/10	0.057 (0.834)	0.145 (0.917)
Number of observations	1074	478

Notes: <sup>1</sup> Robust t-statistics are provided in parentheses. The symbols \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% respectively.

<sup>2</sup> Denotes the group with which comparisons are made.

### 3.2 Consumers

Unlike firms, consumer data cannot form a panel because a different random sample is used every month. Therefore, the only way to check the quality of survey responses for consumers is to compare them with published economic series. The investigation focuses on the questions regarding the general economic situation in the country, employment and inflation. The analysis consists of checking both the current survey variables, as well as the forward looking survey variables, against published quantitative economic series.<sup>9</sup>

The official Consumer Price Index for Cyprus was used to test the consistency to the questions regarding the price trends over the last 12 months and the price trends over the next 12 months. The responses regarding the change of the general economic situation in Cyprus over the last 12 months and the expected change over the next 12 months were compared to the GDP growth for Cyprus for the same period.<sup>10, 11</sup> The replies to the question on unemployment over the next 12 months are compared to the official statistics on the number of registered unemployed. Table 3 presents the way that each option response in different survey questions was compared to the various values of the corresponding quantitative published economic series. For example, responses on price trends over the last 12 months (five-option scale) reported in May 2008 were compared with the change in the CPI between May 2007 and May 2008. In particular, if the observed inflation was greater than 4.2% and the consumer conjectured that prices have “risen a lot”, then we considered his/her prediction to be correct.

The percentage of consumers whose response regarding the evolution of prices and the general economic situation the last 12 months, matched (or did not match) the observed developments in the CPI and economic activity (GDP) respectively, are shown in Figure 5. For the whole period considered, consumers appear to be in better position perceiving the economic situation in Cyprus than price trends. About half of the respondents perceived accurately the economic condition in the country, while only one third of the interviewees stated perceptions about prices that matched observed trends in the CPI. Looking at the results by month (Table A2, Appendix), we observe large variations between months. In the early months of the period considered (June 2008 – October 2008) over half of the respondents reported changes in prices that were consistent with reality (published data). The period July 2009 – October 2009 registered the highest percentages of incorrect predictions (over 95% and as high as 99%) in relation to price trends. During this

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<sup>9</sup> As far as the current survey variables are concerned, we used data for the period May 2008 to April 2010. For the forward looking survey variables the testing period was between May 2008 and April 2009.

<sup>10</sup> The GDP growth for Cyprus (constant prices 2005) is calculated compared to the same quarter of the previous year (source: “Latest Figures: GDP Growth Rate, 1<sup>st</sup> Quarter 2010, Flash Estimate”, Statistical Service of the Republic of Cyprus 12/05/10).

<sup>11</sup> The GDP official series used were only available as quarterly statistics, thus, in making comparisons with monthly BCS variables, the same quarterly value GDP growth value was used for all months within a particular quarter.

period Cyprus experienced negative inflation which was not adequately reflected in the consumer survey results. For the period May 2008 – March 2009, a striking percentage of consumers (over 75%) failed to provide assessments about the general economic situation in Cyprus that were in agreement with published GDP data. However, this period coincides with the economic downturn in Europe, which might have affected consumers' perceptions. For the period July 2009 – March 2009 the percentages of respondents whose perceptions matched the developments in GDP exceeded 75%. This period was characterized by negative or very low growth rates, thus the slowdown in Cyprus was timely captured by the survey data.

**Table 3: Comparison of consumers' survey variables with quantitative published series**

Survey responses	Quantitative economic variables (official statistics)
Price development over the last 12 months	$\pi$ : % change in CPI between month m in year t and month m in year t-1. <sup>1</sup>
Risen a lot	$\pi \geq 4.2$
Risen moderately	$1.8 \leq \pi < 4.2$
Risen slightly or stayed about the same	$0 \leq \pi < 1.8$
Fallen	$\pi < 0$
Price development over the next 12 months	$\pi$ : % change in CPI between month m in year t+1 and month m in year t. <sup>1</sup>
Increase more rapidly	$\pi \geq 4.2$
Increase at the same rate	$1.8 \leq \pi < 4.2$
Increase at a slower rate or stay about the same	$0 \leq \pi < 1.8$
Fall	$\pi < 0$
General economic situation in Cyprus over the last 12 months	y: % change in GDP between quarter q in year t and quarter q in year t-1. <sup>2</sup>
Got a lot better or got a little better	$y \geq 2$
Stayed the same	$0 \leq y < 2$
Got a little worse or got a lot worse	$y < 0$
General economic situation in Cyprus over the next 12 months	y: % change in GDP between quarter q in year t+1 and quarter q in year t. <sup>2</sup>
Get a lot better or get a little better	$y \geq 2$
Stay the same	$0 \leq y < 2$
Get a little worse or get a lot worse	$y < 0$
Unemployment in Cyprus over the next 12 months	u: % change in registered unemployed between month m in year t+1 and month m in year t. <sup>3</sup>
Increase sharply	$u \geq 17$
Increase slightly	$7 \leq u < 17$
Remain the same	$-3 \leq u < 7$
Fall slightly	$-9 \leq u < 3$
Fall sharply	$u < -9$

Notes: <sup>1</sup> Data for inflation for the period June 2006 – April 2010 were used to compute mean inflation (2.4%) and standard deviation (1.8%) and therefore compute the ranges for inflation that are assumed to correspond to different answer options in survey.

<sup>2</sup> Data for GDP for the period 2007Q1 - 2010Q2 were used to compute mean GDP (2.0%) and therefore compute the ranges for GDP that are assumed to correspond to different answer option in survey.

<sup>3</sup> Data for registered unemployed for the period January 2002 – April 2010 were used to compute the percentiles in the year-on-year growth rate in the number of registered unemployed (-9%, -3%, 7%, 17% correspond to the lower 10%, 25%, 50% and 75% percentile respectively).

**Figure 5: Percentage of consumers that perceived price trends and the economic situation correctly**

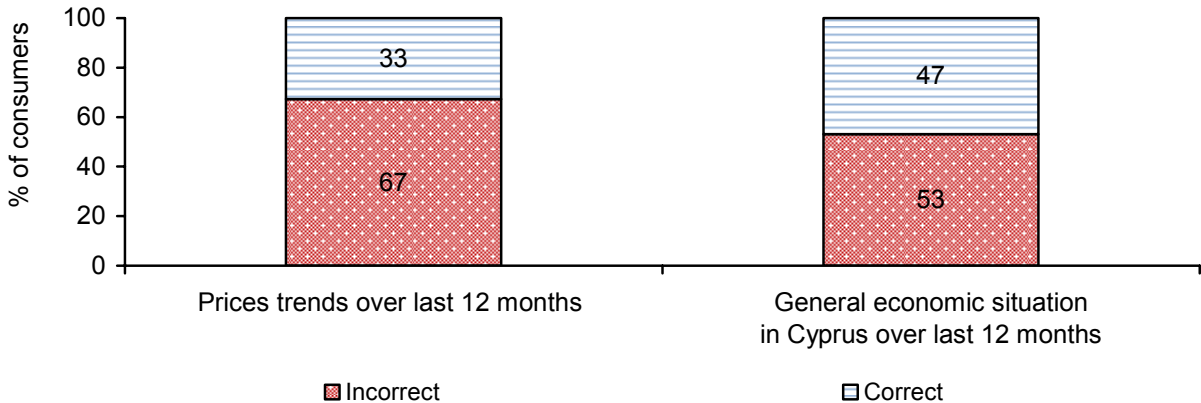
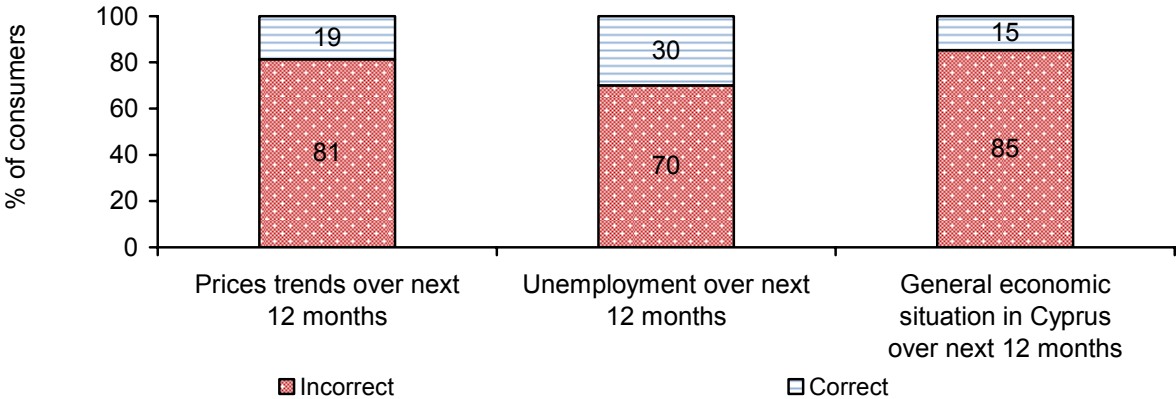


Figure 6 shows the percentage of consumers whose expectations about the price level, unemployment and the general economic situation in Cyprus coincided with published data on CPI, unemployment (registered unemployed) and GDP respectively. The results are rather disappointing as the percentages of respondents who conjectured future economic developments correctly are quite low. The lowest percentage of correct predictions relates to the economic situation in Cyprus in the next 12 months (15%). The high proportion of incorrect predictions persists throughout the period of analysis without evident signs of improvement (Table A3, Appendix). The apparent difficulty of consumers in Cyprus to provide expectations that ultimately agree with realisations might be inherent to the period under consideration. The period was marked by the economic downturn that originated in the United States and subsequently affected many European countries, but reached Cyprus with a considerable lag. Moreover, the long horizon for which respondents are asked to state expectations might also have contributed to the failure of the reported predictions.

**Figure 6: Percentage of consumers that provided correct predictions**



Probit models were estimated to examine the probability that consumer perceptions and expectations about inflation, the economic situation in Cyprus and employment are consistent with the developments in the relevant official macroeconomic series. The dependent variables are binary and take the value 1 if the consumer manages to perceive or predict correctly the change in prices (i.e. inflation), the general economic situation in Cyprus and employment, or 0 otherwise. The independent variables include dummy variables that capture a number of consumer characteristics such as age, gender, level of education, income, occupation, area of stay and working regime, as well as monthly dummy variables that refer to the month of interview.

The results about the probability that consumers' perceptions of the current developments in prices and current economic situation in the country are in agreement with official series are shown in Table 4. As far as the price trends over the last 12 months are concerned, the only consumer characteristic that appears to affect the probability of expressing perceptions consistent with published data is occupation, with the group of self-employed and professionals having the lowest probability of all occupational categories. During the period May 2008 – October 2008 consumers had a better chance of perceiving inflation accurately compared to the following months. The only exception is the period May 2009 – June 2009, where we also observe an improved probability.

The results also show that consumers with higher income are more likely to perceive accurately the general economic situation in Cyprus over the last 12 months than consumers in lower income quartiles. Additionally, respondents over 65 are associated with higher probability of providing accurate perceptions on the current economic situations in Cyprus than respondents in other age groups. We also notice that this probability was significantly lower in the early months that the consumer survey was conducted (second half of 2008).

Table 5 presents the estimated marginal effects concerning consumer expectations (forward looking forward variables). The results show that the only consumer-specific characteristic that affects the probability of predicting price trends over the next 12 months accurately is the area of stay, with lower probability for those in urban areas. However, this probability is influenced somehow by the month of interview.

Household income influences the probability that expectations about future unemployment match actual unemployment observed in the economy. Respondents in lower income quartiles are more probable to give correct predictions about future unemployment trends. Consumers of working age seem to be in a better position to predict the state of unemployment in the country than respondents over 65. Male respondents are associated with lower probability of predicting unemployment accurately than females. The probability of a respondent to express expectations

about future unemployment that match the unemployment rate in the economy is the lowest for those who reside in the Nicosia district. Moreover, this probability was lower during the period May 2008 – January 2009 than later months.

**Table 4: Estimated marginal effects: perceptions (current variables)<sup>1</sup>**

	Prices	General economic situation
Household's income (4th Quartile) <sup>2</sup>		
1st Quartile	-0.027 (-1.268)	-0.115 (-3.805)***
2nd Quartile	-0.031 (-1.629)	-0.090 (-3.385)***
3rd Quartile	-0.003 (-0.141)	-0.085 (-3.081)***
Occupation (Unemployed) <sup>2</sup>		
Self-employed and professionals	-0.084 (-1.656)*	0.017 (0.211)
Clerical and office employees	-0.083 (-1.532)	-0.019 (-0.239)
Skilled manual workers	-0.090 (-1.546)	0.020 (0.203)
Other manual workers	-0.095 (-1.440)	0.005 (0.049)
Other occupations	-0.078 (-1.416)	-0.003 (-0.036)
Working Regime (Part-time) <sup>2</sup>		
Full-time	-0.004 (-0.179)	0.043 (1.568)
Education (Further) <sup>2</sup>		
Primary	0.001(0.0310)	-0.022 (-0.574)
Secondary	0.011 (0.820)	-0.036 (-1.879)*
Age (65+) <sup>2</sup>		
18 – 29	-0.017 (-0.445)	-0.133 (-2.371)**
30 – 49	0.001 (0.001)	-0.097 (-1.804)*
50 – 64	-0.013 (-0.353)	-0.117 (-2.225)**
Gender (Female) <sup>2</sup>		
Male	0.019 (1.514)	-0.007 (-0.378)
District (Famagusta) <sup>2</sup>		
Nicosia	-0.005 (-0.170)	-0.033 (-0.846)
Larnaca	-0.014 (-0.453)	0.005 (0.115)
Limassol	-0.007 (-0.222)	-0.041 (-0.988)
Pafos	-0.024 (-0.743)	0.025 (0.558)
Area (Rural) <sup>2</sup>		
Urban	-0.007 (-0.414)	-0.014 (-0.679)
Month of interview (April-10) <sup>2</sup>		
May-08	0.092 (2.325)**	0.189 (2.536)**
Jun-08	0.177 (4.356)***	0.089 (1.138)
Jul-08	0.162 (3.839)***	-0.019 (-0.219)
Aug-08	0.189 (4.596)***	0.084 (1.036)
Sep-08	0.162 (3.928)***	0.087 (1.091)
Oct-08	0.251 (5.897)***	0.120 (1.516)
Nov-08	0.034 (0.861)	-0.008 (-0.087)
Dec-08	-0.032 (-0.807)	-
Jan-09	-0.117 (-3.254)***	0.373 (5.654)***
Feb-09	-0.054 (-1.469)	0.367 (5.590)***
Mar-09	0.035 (0.928)	0.358 (5.469)***
Apr-09	-0.011 (-0.307)	0.595 (14.390)***
May-09	0.068 (1.669)*	0.582 (13.590)***
Jun-09	0.119 (2.771)***	0.572 (12.750)***
Jul-09	-0.286 (-8.410)***	0.598 (14.940)***
Aug-09	-0.291 (-8.216)***	0.593 (14.630)***
Sep-09	-0.298 (-7.958)***	0.599 (15.100)***
Oct-09	-0.282 (-8.738)***	0.604 (15.410)***
Nov-09	0.045 (1.147)	0.602 (15.460)***
Dec-09	0.030 (0.773)	0.611 (16.710)***
Jan-10	-0.010 (-0.243)	0.601 (15.580)***
Feb-10	-0.016 (-0.437)	0.608 (16.020)***
Mar-10	0.023 (0.625)	0.612 (15.950)***
Number of observations	6281	6051

Notes: <sup>1</sup> Robust t-statistics are provided in parentheses. The symbols \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% respectively.

<sup>2</sup> Denotes the group with which comparisons are made.

**Table 5: Estimated marginal effects: expectations (forward-looking variables)<sup>1</sup>**

	Prices	Unemployment	General economic situation
Household's income (4th Quartile) <sup>2</sup>			
1st Quartile	0.012 (0.533)	0.112 (3.399)***	-0.010 (-0.450)
2nd Quartile	0.019 (0.951)	0.058 (2.042)**	-0.026 (-1.317)
3rd Quartile	0.020 (0.921)	0.042 (1.361)	-0.027 (-1.317)
Occupation (Unemployed) <sup>2</sup>			
Self-employed and professional	-0.008 (-0.175)	-0.008 (-0.113)	0.088 (1.329)
Self-employed farmers	-	-0.034 (-0.368)	-
Clerical and office employees	-0.011 (-0.227)	-0.009 (-0.125)	0.041 (0.791)
Skilled manual workers	-0.014 (-0.254)	-0.020 (-0.192)	0.041 (0.574)
Other manual workers	-0.065 (-1.143)	-	0.158 (1.610)
Other occupations	0.009 (0.175)	0.030 (0.367)	0.075 (1.086)
Working Regime (Part-time) <sup>2</sup>			
Full-time	-0.009 (-0.460)	-0.007 (-0.246)	0.020 (0.965)
Education (Further) <sup>2</sup>			
Primary	-0.016 (-0.629)	0.043 (1.219)	0.044 (1.556)
Secondary	-0.020 (-1.503)	0.0231 (1.197)	-0.001 (-0.059)
Age (65+) <sup>2</sup>			
18 – 29	0.007 (0.192)	0.165 (2.552)**	-0.037 (-1.179)
30 – 49	-0.013 (-0.397)	0.193 (3.577)***	-0.054 (-1.728)*
50 – 64	-0.008 (-0.250)	0.229 (3.977)***	-0.064 (-2.284)**
Gender (Female) <sup>2</sup>			
Male	-0.013 (-1.034)	-0.039 (-2.212)**	0.030 (2.308)**
District (Famagusta) <sup>2</sup>			
Nicosia	0.043 (1.454)	-0.112 (-2.961) ***	-0.002 (-0.062)
Larnaca	0.024 (0.735)	-0.041 (-1.045)	0.016 (0.474)
Limassol	0.041 (1.315)	-0.047 (-1.192)	0.009 (0.276)
Pafos	0.034 (0.983)	0.046 (1.039)	0.012 (0.343)
Area (Rural) <sup>2</sup>			
Urban	-0.031 (-1.982)**	-0.028 (-1.312)	-0.014 (-0.867)
Month of interview (May-09) <sup>2</sup>			
May-08	0.043 (1.468)	-0.226 (-7.109)***	0.003 (0.072)
Jun-08	0.044 (1.536)	-0.200 (-6.319)***	-0.026 (-0.831)
Jul-08	-0.151 (-4.969)***	-0.194 (-5.780)***	-
Aug-08	-0.146 (-5.913)***	-0.195 (-5.993)***	0.099 (2.689)***
Sep-08	-0.137 (-5.912)***	-0.222 (-6.929)***	0.083 (2.295)**
Oct-08	-0.101 (-4.396)***	-0.206 (-6.360)***	0.027 (0.778)
Nov-08	0.240 (6.479)***	-0.153 (-4.448)***	-0.009 (-0.256)
Dec-08	-	-	-0.033 (-1.002)
Jan-09	0.015 (0.507)	-0.074 (-2.014)**	0.175 (4.383)***
Feb-09	-0.018 (-0.677)	0.012 (0.320)	0.170 (4.403)***
Mar-09	0.002 (0.063)	0.045 (1.151)	0.160 (4.253)***
Apr-09	0.047 (1.637)	0.002 (0.0470)	-
Number of observations	3048	3052	2784

Notes: <sup>1</sup> Robust t-statistics are provided in parentheses. The symbols \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% respectively. Survey questions refer to developments over the next 12 months, so the period used in estimation spans from May 2008 to April 2009.

<sup>2</sup> Denotes the group with which comparisons are made.

The probability that consumer expectations about the general economic conditions in Cyprus are in agreement with official data on economic activity is affected by respondent's age, gender and the month of the interview. Surprisingly, consumers of more productive ages (30 – 64) are associated with the lowest probability of providing correct predictions. Male respondents are more likely to predict correctly the economic activity in Cyprus. We also observe an increase in this probability in more recent months.

#### **4. ANALYSIS OF AGGREGATE DATA**

Next we provide an analysis of the business survey series at an aggregate level. We investigate the degree of the association between BCS sectoral confidence indicators and a number of officially published quantitative economic variables related with services, retail trade, industry and construction sector. In particular, useful leading information could be found not only in the sectoral confidence indicators but also in specific BCS questions that might or might not included in the construction of the confidence indicators. Therefore, we also study the relation between specific BCS questions on economic activity, employment expectations and selling-price expectations, and relevant published economic variables.<sup>12</sup>

Pairwise correlation coefficients between economic variables and various leads and lags of the BCS series are presented in Tables A6-A10 (Appendix). Correlations were computed for the whole sample period (May 2001 – April 2010 for industry; May 2002 – April 2010 for services, retail trade and construction), as well as for the two sub periods before and after May 2008, when the change of institute conducting BCS in Cyprus occurred.

We observe stronger correlations of BCS series with corresponding quantitative economic variables in the second sub period (May 2008 – April 2010), especially in the case of construction, industry and retail trade. In most cases, the significant correlations reported for the whole period appear to be the result of high correlations in the second period.

For the majority of variable pairs we obtain statistically significant correlation coefficients that peak at some lag. Due to the lack of a single quantitative variable measuring the activity of the services sector, we used alternative available turnover indices for large subsectors of services, namely hotels and restaurants and transport, storage and communications. Hence, we get somewhat smaller correlations of survey variables with officially published variables relating to economic activity in services compared to other sectors. The weakest association of survey with quantitative variables relates to employment. In particular, for industry employment correlations are insignificant, while construction registers the strongest correlations. Selling price

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<sup>12</sup> Prior to correlation analysis and estimation, all variables were tested for unit roots and test results indicate that the transformation of the variables used are stationary (see Tables A4 - A5 in the Appendix).

expectations seem to be highly correlated with relevant series published by the Statistical Service in construction and retail trade, while lower correlations of selling price expectations with inflation are obtained in services. Price expectations in industry are not significantly correlated with the price index of manufacturing production.

The relationship between published sectoral series and lags of BCS variables is explored further using regression analysis. The modelling strategy consisted of the estimation of a regression model for the economic variable on four lags of the sectoral confidence indicator; insignificant variables were subsequently removed. Moreover, regressions of quantitative variables for each sector on the BCS variables, that form the sectoral confidence indicator (lagged up to four periods), were estimated to examine which components of the indicator are more informative about quantitative series. Estimation results are shown on Tables 6 and 7. Sectoral confidence indicators appear to contain leading information about the relevant sector activity variable, since some of the lag(s) of the former affect positively and significantly the quantitative variables. The confidence indicators in retail trade and industry explain over 50% of the variation in the value index of retail trade and the volume index of manufacturing production, respectively. The smallest explanatory power of a confidence indicator relates to the services indicator, which accounts for about 15% of the variation in hotels and restaurants turnover index. However, the series index works better in the case of transport, storage and communication subsector, where the services confidence indicator explains 41% of the variation in the turnover value index of the particular subsector.

**Table 6: Estimation results: economic activity – confidence indicators**

	<b>Retail trade</b>	<b>Industry</b>	<b>Construction</b>	<b>Services</b>	<b>Services</b>
Dependent variable <sup>1</sup>	Value index of retail trade	Volume index of manufacturing production	Local sales of cement	Turnover index of hotels and restaurants	Turnover value index in transport, storage and communication
	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)
Sectoral confidence indicator <sup>2</sup> , lag 1	0.0014 (2.40)		0.0021 (2.01)		
Sectoral confidence indicator, lag 2		0.0032 (5.73)		0.0021 (3.08)	0.0023 (2.71)
Sectoral confidence indicator, lag 3	0.0023 (3.40)		0.0023 (2.80)		
Sectoral confidence indicator, lag 4		0.0015 (2.90)	0.0032 (3.64)		0.0023 (3.67)
Constant	0.0604 (8.46)	0.0062 (1.21)	0.0760 (4.69)	0.0411 (3.67)	0.0329 (3.34)
Adjusted R <sup>2</sup>	0.5163	0.5927	0.4771	0.1512	0.4908
Number of observations	80	91	80	75	79

Notes : <sup>1</sup> All dependent variables are expressed in year-on-year growth rates.

<sup>2</sup> All survey variables are expressed in year-on-year changes.

**Table 7: Estimation results: economic activity – confidence indicator components**

	<b>Retail trade</b>	<b>Industry</b>	<b>Construction</b>	<b>Services</b>	<b>Services</b>
Dependent variable <sup>1</sup>	Value index of retail trade	Volume index of manufacturing production	Local sales of cement	Turnover index of hotels and restaurants	Turnover value index in transport, storage and communication
Confidence indicator components <sup>2</sup>	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)
Sales, lag 1	0.0009 (2.39)				
Sales expectations, lag 1	0.0008 (3.46)				
Sales expectations, lag 3	0.0009 (2.67)				
Production expectations, lag 2		0.0014 (4.99)			
Production expectations, lag 3		0.0009 (4.01)			
Production expectations, lag 4		0.0012 (4.45)			
Order books, lag 3			0.0032 (4.50)		
Order books, lag 4			0.0033 (4.47)		
Demand, lag 4					0.0024 (6.88)
Demand expectations, lag 2					
Demand expectations, lag 3				0.0016 (3.19)	0.0023 (3.99)
Demand expectations, lag 4				0.0012 (1.96)	
Constant	0.0574(8.16)	0.0063 (1.13)	0.0692 (4.54)	0.0427 (4.66)	0.0345 (4.27)
Adjusted R <sup>2</sup>	0.5243	0.5727	0.4934	0.3042	0.5632
Number of observations	80	91	80	75	79

Notes: <sup>1</sup> All dependent variables are expressed in year-on-year growth rates.

<sup>2</sup> All survey variables are expressed in year-on-year changes.

Looking at the components of the confidence indicator, we find that sales perceptions and expectations, production expectations, order books and demand perceptions and expectations are the most informative BCS questions about future developments in sectoral activity variables in retail trade, industry, construction and services respectively.

The estimation results in Table 8 show that firms' employment expectations in all sectors are negatively linked to the number of registered unemployed in each sector. An increase in the proportion of firms that expected higher future employment levels in the previous months, tend to decrease the current percentage change in registered unemployed in all sectors.

Expectations about rises in firms' selling prices stated in the recent past, influence positively and significantly inflation (percentage change in price indices) in retail trade goods, manufacturing production goods, as well as in main construction materials (Table 9). Selling price expectations in services, however, do not appear to affect overall inflation. This weak association in the case

of services might be due to the absence of a price index pertaining exclusively to the service sector.<sup>13</sup>

**Table 8: Estimation results: employment**

	<b>Retail trade</b>	<b>Industry</b>	<b>Construction</b>	<b>Services</b>
Dependent variable <sup>1</sup>	Reg. unempl. (wholesale & retail trade)	Reg. unempl. (manufacturing)	Reg. unempl. (construction)	Reg. unempl. (services)
	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)
Sectoral employment expectations <sup>2</sup> , lag 1	-0.0089 (-2.77)		-0.0071 (-2.87)	-0.0219 (-3.68)
Sectoral employment expectations, lag 2		-0.0039 (-5.48)		-0.0142 (-2.76)
Sectoral employment expectations, lag 3		-0.0039 (-5.50)		-0.0136 (-3.63)
Sectoral employment expectations, lag 4		-0.0040 (-4.45)	-0.0072 (-2.64)	-0.0156 (-2.99)
Constant	0.0271 (1.79)	-0.0088 (-0.26)	0.1225 (1.57)	-0.0055 (-0.15)
Adjusted R <sup>2</sup>	0.0519	0.4208	0.1862	0.2058
Number of observations	93	93	81	87

Notes: <sup>1</sup> All dependent variables are expressed in year-on-year growth rates except for registered unemployed of retail trade and services which are expressed in month-on-month growth rates.

<sup>2</sup> All survey variables are expressed in year-on-year changes except for employment expectations of retail trade and services which are expressed in month-on-month changes.

<sup>13</sup> The difficulty of creating a price index for services from subcategories of the CPI due to the fact that some subcategories do not refer solely to services, led to the use of the general CPI in the analysis.

**Table 9: Estimation results: selling prices**

	<b>Retail trade</b>	<b>Industry</b>	<b>Construction</b>	<b>Services</b>
Dependent variable <sup>1</sup>	Price index (retail trade)	Price index (manufacturing production)	Price index (main constr. materials)	Price index (CPI) <sup>3</sup>
	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)	Est. (t-ratio)
Sectoral Selling price expectations <sup>2</sup> , lag 1	0.0182 (2.13)		0.0003 (2.52)	
Sectoral Selling price expectations, lag 2			0.0003 (3.23)	
Sectoral Selling price expectations, lag 3	0.0211 (3.10)	0.0004 (1.93)	0.0003 (3.41)	
Sectoral Selling price expectations, lag 4	0.0262 (4.68)	0.0005 (2.08)	0.0006 (5.16)	
Constant	2.0592 (17.73)	0.0395 (7.98)	0.0612 (13.52)	2.6087 (9.17)
Adjusted R <sup>2</sup>	0.5479	0.1680	0.6311	0.0563
Number of observations	69	92	80	72

Notes: <sup>1</sup> All dependent variables are expressed in year-on-year growth rates.

<sup>2</sup> All survey variables are expressed in year-on-year changes.

<sup>3</sup> Only selling-price expectations lead 2 is significant for services.

## 5. CONCLUSIONS

This paper attempts to assess the quality of BCS data for Cyprus at a micro (individual firms and consumers) and at an aggregate level (sectors of the economy) level, using statistical and econometric analysis. Data for the period May 2008 – April 2010 are used in the micro analysis. Data from May 2002 to April 2010 are employed in the aggregate analysis for services, retail trade and construction, while for industry the period under examination is May 2001 – April 2010.

At micro level, we examine the consistency of firms' replies by comparing their expectations stated in a particular month with realisations reported by the same participants in subsequent surveys. In the case of consumers, where a different random sample is selected each month, the consistency of their responses is checked by comparison with officially published economic data. Furthermore, we try to determine the firm- and consumer-specific characteristics that affect the likelihood that the stated expectations are in agreement with realisations, in other words, the probability of an interviewee to provide correct predictions.

Micro analysis showed that the majority of firms in services, industry and construction provided correct predictions about their future economic activity, in the sense that their expectations about their activity in the next three months stated in a given month, matched their realisations reported three months later. In retail trade, about one third of firms overpredicted their activity. Employment expectations of firms in services were realised for over 75% of the respondents, while in construction we observe a considerable proportion of firms that overpredicted. Econometric analysis showed that the probability that a firm in services or in construction provides correct predictions about its activity depends on firm size, legal form, type of interview and the subsector. In the same sectors, the probability that a firm's expectations about employment matched realisations is found to be influenced by firm size, years of operation, legal form, district and the subsector of activity. The results of the micro analysis relating to consumers are rather disappointing, as the proportion of interviewees that provided correct predictions about future developments in the economy is quite low, ranging from 15% for the general economic condition in Cyprus to 30% for unemployment. Household income, age, gender and the month of interview impact significantly on the probability that a consumer predicted correctly future unemployment, while only age, gender and the month of interview influence the probability of an interviewee to predict correctly the general economic situation.

At an aggregate level, we examined the relation between BCS indicators and officially published quantitative economic variables associated with services, retail trade, industry and construction. The results showed that sectoral confidence indicators contain significant leading information about quantitative sectoral activity variables. Moreover, firms' employment expectations are useful leading indicators for the number of registered unemployed in each sector and firms' selling price expectations are informative about inflation in retail trade and manufacturing production goods, as well as for inflation in main construction materials.

Both micro and aggregate analysis revealed that business survey data reflect quite well future economic developments at a firm (especially in services, industry and construction) and sectoral level. The analysis, however, concerning consumer survey data showed that a large percentage of participants had stated expectations about price trends, unemployment and the general economic conditions in Cyprus that diverged from actual outcomes. Moreover, the majority of consumers were unsuccessful in forming perceptions about economic variables that were in agreement with actual data. As mentioned previously, the failure of consumer survey data to adequately capture current and future developments in the economy might be due to the uncertainty caused by the economic crisis that was dominant during the period under examination. Furthermore, unlike firms, consumers are asked to express expectations for a longer time horizon which could adversely affect their ability to provide correct predictions, due to unforeseen events that might hit the economy.

All in all, business survey data appear to contain a valuable leading information for a number of officially published quantitative sectoral variables relating to activity, prices and unemployment. This finding is also confirmed by micro analysis that showed that the majority of firms were successful in predicting their activity, prices and employment levels, despite the uncertain economic climate during the period under consideration. Thus, business survey data can constitute a valuable tool to policy-makers for monitoring economic developments (not only in the aggregate economy but also in specific sectors) and consequently for planning/implementing timely economic policies. Firms can also utilise the information in business survey data to gain insights about changes in their own and other sectors of economic activity. Hence, such information can be useful for purposes of financial planning and decision-making. Nevertheless, the constant evaluation of BCS data will continue to be a part of the Centre's research agenda and efforts will be made to continue to produce quality survey data. A further objective of the Centre is the development of models for forecasting various indicators of the Cyprus economy where BCS data, along with other leading indicators, will be used as an input.

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## APPENDIX

**Table A1: Percentage of firms that provided correct (incorrect) predictions: economic activity and employment<sup>1</sup>**

	Correct (% of firms)				Overpredict (% of firms)				Underpredict (% of firms)			
	++	=	--	Total	+=	+-	=-	Total	-=	-+	=+	Total
<b>Services</b>												
Demand	13	26	16	<b>55</b>	12	5	7	<b>25</b>	8	3	5	<b>16</b>
Employment	6	64	5	<b>76</b>	6	1	4	<b>10</b>	5	0	7	<b>12</b>
<b>Retail trade</b>												
Sales	11	19	20	<b>49</b>	10	8	14	<b>33</b>	6	2	5	<b>14</b>
<b>Industry</b>												
Production	6	36	17	<b>58</b>	8	4	13	<b>25</b>	10	1	3	<b>13</b>
<b>Construction</b>												
Order Books	1	28	31	<b>60</b>	4	1	16	<b>20</b>	14	2	3	<b>19</b>
Employment	1	35	16	<b>51</b>	6	1	31	<b>38</b>	5	1	4	<b>10</b>

Notes: <sup>1</sup> The symbols "+", "=" and "-" denote "increase", "remain unchanged" and "decrease" respectively, and in each pair shown in columns 2-4, 6-8 and 10-12 the first symbol refers to expectations and the second to realisations.

<sup>2</sup> Totals do not add up to 100% due to a small percentage of non-respondents.

<sup>3</sup> The number of firms in services, retail trade, industry and construction was 53, 82, 22 and 23 respectively.

**Table A2: Percentage of consumers that perceived price trends and economic situation correctly**

Time	Prices trends over last 12 months		General economic situation in Cyprus over last 12 months	
	Incorrect (%)	Correct (%)	Incorrect (%)	Correct (%)
05-08	56	44	89	11
06-08	48	52	94	6
07-08	48	52	95	5
08-08	45	55	92	8
09-08	44	56	92	8
10-08	43	57	93	7
11-08	68	32	95	5
12-08	71	29	95	5
01-09	76	24	75	25
02-09	74	26	79	21
03-09	68	32	81	19
04-09	68	32	27	73
05-09	60	40	27	73
06-09	58	42	32	68
07-09	97	3	23	77
08-09	99	1	21	79
09-09	98	2	20	80
10-09	98	2	18	82
11-09	64	36	18	82
12-09	64	36	15	85
01-10	68	32	17	83
02-10	68	32	16	84
03-10	65	35	16	84
04-10	68	32	-	-
TOTAL	67	33	53	47

**Table A3: Percentage of consumers that provided correct predictions**

Time	Prices trends over next 12 months		Unemployment over next 12 months		General economic situation in Cyprus over next 12 months	
	Incorrect (%)	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)	Correct (%)
05-08	75	25	82	18	89	11
06-08	73	27	82	18	90	10
07-08	99	1	80	20	92	8
08-08	97	3	79	21	83	17
09-08	95	5	82	18	83	17
10-08	93	7	78	22	88	12
11-08	53	47	71	29	88	12
12-08	80	20	61	39	93	7
01-09	78	22	65	35	74	26
02-09	81	19	54	46	78	22
03-09	80	20	51	49	81	19
04-09	74	26	59	41	-	-
TOTAL	81	19	70	30	85	15

**Table A4: Unit root test – Officially published series<sup>1</sup>**

	Test statistic	5% critical value	Lags
Services			
Turnover index of hotels and restaurants	-3.267	-2.912	1
Turnover value index in transport, storage and communication	-4.442	-2.901	0
Registered unemployed - services	-3.272	-3.451	12
Inflation	-4.038	-2.896	8
Construction			
Local sales of cement	-4.116	-3.462	11
Registered unemployed - construction	-3.706	-2.899	11
Price index of main construction materials	-3.426	-2.892	2
Industry			
Volume index of manufacturing production	-4.365	-2.900	11
Registered unemployed - manufacturing	-2.957	-2.899	11
Price index of manufacturing production	-1.621	-2.891	0
Retail Trade			
Value index of retail trade	-3.744	-2.900	11
Registered unemployed - wholesale and retail trade	-3.835	-2.890	5
Inflation - retail trade	-3.451	-3.451	1

Notes: <sup>1</sup>All economic variables are expressed in year-on-year growth rates except for registered unemployed- services and registered unemployed – wholesale and retail trade, which are expressed in month-on-month growth rates.

**Table A5: Unit root test – Survey variables<sup>1</sup>**

	Test statistic	5% critical value	Lags
<b>Services</b>			
Confidence indicator	-3.285	-2.903	0
Business situation	-4.783	-3.477	11
Demand	-3.912	-3.477	11
Demand expectations	-3.045	-2.912	11
Employment expectations	-6.388	-2.904	7
Selling-price expectations	-5.142	-3.479	1
<b>Construction</b>			
Confidence indicator	-3.793	-2.912	11
Activity trends	-4.590	-2.904	1
Order books	-4.071	-2.912	11
Employment expectations	-2.942	-2.912	11
Selling-price expectations	-4.600	-2.912	11
<b>Industry</b>			
Confidence indicator	-3.590	-3.466	12
Production trend	-3.522	-2.902	11
Order books	-5.173	-3.465	11
Export order books	-4.448	-3.465	11
Production expectations	-4.183	-2.902	11
Employment expectations	-3.854	-3.465	11
Selling-price expectations	-4.910	-2.902	11
<b>Retail trade</b>			
Confidence indicator	-4.046	-2.912	11
Sales	-3.982	-2.903	0
Sales expectations	-4.186	-2.912	11
Intentions of placing orders	-3.573	-2.912	11
Employment expectations	-5.119	-2.900	5
Selling-price expectations	-5.933	-3.489	11

Notes: <sup>1</sup>All survey variables/indices are expressed in year-on-year changes except for employment expectations - services and employment expectations- wholesale and retail trade which are expressed in month-on-month changes.

**Table A6: Correlations between economic and BCS variables - Services<sup>1</sup>**

Real Variables <sup>2</sup>	Turnover index of hotels and restaurants			Turnover value index in transport, storage and communication			Registered unemployed - services			Inflation		
BCS variables/indices <sup>3</sup>	Services confidence indicator			Services confidence indicator			Employment expectations			Selling-price expectations		
	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10
+4	0.22	-0.19	0.12	0.43*	0.06	0.34	0.18	0.18	0.15	0.27*	-0.10	0.58*
+3	0.32*	-0.09	0.33	0.44*	0.10	0.26	0.31*	0.32	0.28	0.40*	-0.01	0.78*
+2	0.34*	-0.05	0.34	0.43*	0.05	0.26	0.28*	0.28	0.33	0.42*	-0.02	0.82*
+1	0.41*	0.01	0.53*	0.53*	0.15	0.46*	0.07	0.11	-0.09	0.39*	-0.05	0.75*
0	0.43*	0.01	0.60*	0.56*	0.13	0.56*	-0.21*	-0.18	-0.30	0.33*	-0.16	0.68*
-1	0.38*	-0.07	0.53*	0.57*	0.22	0.44*	-0.31*	-0.31	-0.35	0.26*	-0.15	0.53*
-2	0.40*	0.06	0.40	0.66*	0.51*	0.40	-0.15	-0.18	-0.08	0.27*	-0.07	0.48*
-3	0.36*	0.01	0.35	0.66*	0.44*	0.48*	-0.19	-0.16	-0.32	0.28*	0.10	0.38
-4	0.35*	0.02	0.23	0.65*	0.47*	0.42*	-0.22*	-0.16	-0.41*	0.23	0.10	0.27

Notes: <sup>1</sup> Asterisk denotes statistically significant correlation at 5% level.

<sup>2</sup> All economic variables are expressed in year-on-year growth rates except for registered unemployed which is expressed in month-on-month growth rates.

<sup>3</sup> All survey variables/indices are expressed in year-on-year changes except for employment expectations which are expressed in month-on-month changes.

**Table A7: Correlations between economic and BCS variables - Services<sup>1</sup>**

Real Variables <sup>2</sup>	Turnover index of hotels and restaurants									Turnover value index in transport, storage and communication								
	Business situation			Demand			Demand expectations			Business situation			Demand			Demand expectations		
BCS variables / indices <sup>3</sup>	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10
+4	0.19	-0.12	0.08	0.28*	0.02	0.09	0.08	-0.28*	0.14	0.38*	-0.02	0.53*	0.41*	0.01	0.47*	0.23*	0.05	-0.11
+3	0.22	-0.16	0.29	0.31*	-0.06	0.36	0.26*	0.01	0.21	0.38*	-0.02	0.40	0.39*	0.04	0.28	0.33*	0.17	0.01
+2	0.25*	-0.11	0.34	0.29*	-0.09	0.35	0.30*	0.09	0.19	0.31*	-0.11	0.26	0.37*	-0.03	0.27	0.39*	0.22	0.15
+1	0.31*	-0.11	0.64*	0.38*	-0.02	0.57*	0.33*	0.15	0.20	0.37*	-0.03	0.39	0.47*	0.09	0.44*	0.46*	0.23	0.37
0	0.37*	-0.02	0.67*	0.40*	-0.01	0.61*	0.30*	0.05	0.31	0.40*	-0.03	0.46*	0.49*	0.07	0.52*	0.49*	0.22	0.51*
-1	0.26*	-0.17	0.52*	0.35*	-0.04	0.51*	0.33*	0.05	0.38	0.42*	0.02	0.40	0.48*	0.12	0.38	0.50*	0.28*	0.40
-2	0.29*	-0.01	0.29	0.27*	-0.13	0.37	0.46*	0.27	0.40	0.53*	0.30*	0.33	0.57*	0.38*	0.32	0.57*	0.42*	0.40
-3	0.16	-0.21	0.18	0.24*	-0.14	0.29	0.53*	0.37*	0.44*	0.55*	0.34*	0.35	0.62*	0.43*	0.44*	0.51*	0.23	0.49*
-4	0.16	-0.15	0.04	0.19	-0.13	0.04	0.50*	0.26	0.58*	0.58*	0.42*	0.35	0.66*	0.52*	0.45*	0.41*	0.10	0.31

Notes: <sup>1</sup> Asterisk denotes statistically significant correlation at 5% level.

<sup>2</sup> All economic variables are expressed in year-on-year growth rates.

<sup>3</sup> All survey variables/indices are expressed in year-on-year changes.

**Table A8: Correlations between economic and BCS variables - Construction<sup>1</sup>**

Real Variables <sup>2</sup>		Local sales of cement						Registered unemployed - construction			Price index of main construction materials				
BCS variables/indices <sup>3</sup>	Construction confidence indicator	Activity trends			Order books			Employment expectations			Selling-price expectations				
	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10
+4	0.22*	-0.01	-0.37	0.12	-0.09	-0.01	0.31*	-0.01	-0.27	-0.13	-0.16	0.44*	-0.13	-0.25	-0.53
+3	0.32*	0.11	-0.17	0.25*	0.14	0.10	0.46*	0.21	-0.03	-0.15*	-0.12	0.23	0.01	-0.14	-0.25
+2	0.35*	0.05	0.10	0.20*	-0.09	0.36	0.43*	0.05	0.24	-0.22*	-0.14	-0.01	0.12	-0.06	0.02
+1	0.44*	0.19	0.26	0.34*	0.20	0.41*	0.51*	0.20	0.37	-0.45*	-0.45*	-0.23	0.27*	0.09	0.28
0	0.49*	0.13	0.58*	0.37*	0.11	0.70*	0.59*	0.27*	0.64*	-0.44*	-0.33*	-0.46*	0.42*	0.25	0.53*
-1	0.50*	0.10	0.68*	0.31*	-0.02	0.73*	0.52*	0.10	0.65*	-0.35*	-0.11	-0.60*	0.53*	0.38*	0.69*
-2	0.48*	0.01	0.68*	0.34*	0.06	0.69*	0.56*	0.20	0.60*	-0.22*	0.16	-0.67*	0.59*	0.45*	0.77*
-3	0.59*	0.24	0.75*	0.33*	-0.01	0.78*	0.62*	0.32*	0.69*	-0.35*	-0.03	-0.76*	0.62*	0.48*	0.82*
-4	0.61*	0.34*	0.70*	0.38*	0.26*	0.56*	0.63*	0.38*	0.67*	-0.35*	-0.01	-0.79*	0.67*	0.61*	0.79*

Notes: <sup>1</sup> Asterisk denotes statistically significant correlation at 5% level.

<sup>2</sup> All economic variables are expressed in year-on-year growth rates.

<sup>3</sup> All survey variables/indices are expressed in year-on-year changes.

**Table A9: Correlations between economic and BCS variables - Industry<sup>1</sup>**

Real Variables <sup>2</sup>	Volume index of manufacturing production															Registered unemployed - manufacturing			Price index of manufacturing production		
	Industry confidence indicator			Production trend			Order books			Export order books			Production expectations			Employment expectations			Selling-price expectations		
BCS variables/indices <sup>3</sup>	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10	May 01- Apr 10	May 01- Apr 08	May 08- Apr 10
+4	0.21	-0.05	-0.23	0.33*	-0.07	0.23	0.32*	-0.16	0.37	-0.03	-0.24*	-0.55*	0.21*	0.03	-0.10	-0.21	0.05	0.26	-0.34	-0.30	-0.55
+3	0.30*	0.05	-0.13	0.37*	-0.12	0.45*	0.38*	-0.11	0.49*	0.08	-0.19	-0.36	0.25*	0.03	-0.01	-0.26	-0.02	0.16	-0.23	-0.24	-0.36
+2	0.36*	-0.02	0.24	0.40*	-0.20	0.67*	0.33*	-0.25*	0.67*	0.17	-0.21	-0.05	0.32*	0.02	0.28	-0.28	-0.05	0.22	-0.14	-0.22	-0.17
+1	0.48*	0.14	0.39	0.51*	0.09	0.63*	0.44*	-0.06	0.72*	0.29*	0.03	-0.10	0.42*	0.10	0.44	-0.34	0.02	-0.07	-0.01	-0.15	0.04
0	0.62*	0.24	0.69*	0.59*	0.12	0.82*	0.50*	-0.01	0.85*	0.37*	-0.04	0.21	0.53*	0.12	0.69*	-0.38	0.01	-0.18	0.11	-0.11	0.27
-1	0.62*	0.19	0.74*	0.56*	0.07	0.76*	0.50*	0.02	0.78*	0.40*	-0.07	0.31	0.49*	-0.01	0.70*	-0.41	-0.01	-0.27	0.25	0.04	0.40
-2	0.75*	0.43*	0.88*	0.56*	0.12	0.67*	0.53*	0.08	0.79*	0.44*	-0.16	0.55*	0.63*	0.23	0.83*	-0.46	0.02	-0.46	0.26	-0.03	0.48
-3	0.65*	0.19	0.84*	0.48*	0.09	0.49*	0.43*	-0.02	0.56*	0.45*	-0.11	0.53*	0.60*	0.19	0.80*	-0.47	0.01	-0.48	0.36	0.08	0.58
-4	0.55*	0.29*	0.70*	0.28*	0.20	0.43*	0.31*	0.16	0.48*	0.50*	0.09	0.62*	0.41*	0.14	0.68*	-0.48	0.04	-0.54	0.38	0.09	0.62

Notes: <sup>1</sup>Asterisk denotes statistically significant correlation at 5% level.

<sup>2</sup>All economic variables are expressed in year-on-year growth rates.

<sup>3</sup>All survey variables/indices are expressed in year-on-year changes.

**Table A10: Correlations between economic and BCS variables - Retail trade<sup>1</sup>**

Real Variables <sup>2</sup>	Value index of retail trade									Registered unemployed - wholesale and retail trade			Inflation - retail trade					
	Retail trade confidence indicator			Sales		Sales expectations			Intentions of placing orders		Employment expectations		Selling-price expectations					
BCS variables/indices <sup>3</sup>	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10	May 02-Apr 10	May 02-Apr 08	May 08-Apr 10
+4	0.19	-0.22	-0.26	0.37*	-0.11	0.28	0.11	-0.01	-0.41	0.04	-0.29*	-0.29	0.02	0.02	0.26	0.07	0.12	-0.19
+3	0.34*	0.02	-0.07	0.50*	0.06	0.49*	0.25*	0.11	-0.19	0.13	-0.26*	-0.11	-0.02	-0.05	0.33	0.14	0.10	0.06
+2	0.44*	0.01	0.25	0.47*	-0.20	0.67*	0.37*	0.21	0.07	0.23*	-0.16	0.06	-0.04	0.00	0.00	0.14	-0.01	0.22
+1	0.53*	0.07	0.41	0.62*	0.13	0.79*	0.41*	0.12	0.20	0.32*	-0.18	0.32	-0.12	-0.05	-0.26	0.31*	0.12	0.44*
0	0.63*	0.11	0.62*	0.57*	-0.11	0.86*	0.56*	0.28*	0.45*	0.39*	-0.11	0.39	-0.22*	-0.13	-0.51*	0.38*	0.14	0.54*
-1	0.65*	0.06	0.72*	0.58*	0.09	0.63*	0.59*	0.15	0.61*	0.44*	-0.11	0.56*	-0.25*	-0.18	-0.49*	0.50*	0.18	0.75*
-2	0.65*	0.05	0.71*	0.56*	-0.04	0.68*	0.55*	0.13	0.49*	0.40*	-0.18	0.43*	-0.17	-0.09	-0.33	0.61*	0.32*	0.84*
-3	0.70*	0.05	0.85*	0.52*	0.03	0.50*	0.66*	0.15	0.78*	0.54*	-0.01	0.70*	0.04	0.22	-0.13	0.68*	0.48*	0.83*
-4	0.67*	0.04	0.73*	0.50*	0.06	0.41	0.60*	0.02	0.71*	0.47*	-0.19	0.64*	0.08	0.15	0.17	0.65*	0.54*	0.74*

Notes: <sup>1</sup>Asterisk denotes statistically significant correlation at 5% level.

<sup>2</sup>All economic variables are expressed in year-on-year growth rates except for registered unemployed which are expressed in quarter-on-quarter growth rates.

<sup>3</sup>All survey variables/indices are expressed in year-on-year changes except for employment expectations which are expressed in quarter-on-quarter changes.

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