Cyprus Economic Policy Review, Vol. 4, No. 1, pp. 47-61 (2010) 1450-4561

Business and Consumer Surveys in Cyprus†

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Abstract

This paper investigates the usefulness of information collected through Business and Consumer Surveys in Cyprus, as a tool for monitoring the developments in the economy and as an input in econometric modelling for the construction of short-term forecasts for macroeconomic variables. The analysis shows that the readily available data from Business and Consumer Surveys capture quite well the different trends both in the economy as a whole and in several sectors. The survey data contain leading information for the future evolution of output growth and, to a smaller extent, of inflation. Moreover, the analysis for different sectors revealed that Business and Consumer Survey data exhibit significant correlations with the corresponding quantitative economic variables published by the Statistical Service and in most cases the changes in survey variables lead the changes in the relevant economic variables. Nevertheless, there are still other aspects of the survey data to be explored and there is room for improvement in the survey results.

Keywords: business and consumer surveys, economic sentiment indicator, confidence indicators.

1. Introduction

Business and Consumer Surveys (BCS) aim at gathering information regarding firms' and consumers' perceptions and expectations about their current and future economic conditions and about the economy as a whole. Moreover, the Surveys record perceptions and expectations about various firm- or household-specific economic variables such as prices, employment, production, demand, sales, savings, purchase of durables, etc. BCS data collected during a month are released at the end of the particular month, hence they are available long before the official publication of economic activity data, for example the Gross Domestic

† Business and Consumer Surveys in Cyprus for the period May 2008 – April 2011 are funded by the European Commission and the Ministry of Finance.

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Product (GDP). Consequently, the usefulness of BCS data lies in the timeliness of the information they contain about future developments in macroeconomic series. Such data therefore are used as a tool for monitoring the economy by policy makers and businesses, as well as in the construction of short-term forecasts for a number of economic series, for instance the growth rate of GDP.

Because of the importance of BCS data, the European Commission carries out harmonised surveys in EU member states and a number of candidate countries (European Commission 2007). 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. The data collection is carried out between the first and third week of each month, through interviews (based on harmonised questionnaires) with managers/directors of firms in services, retail trade, construction and industry, and with consumers. The sampling method for the business surveys assigns higher probability of selection to firms of larger size, so as to limit the inclusion in the selected sample of many small-size firms that are often associated with high non-response rates and, in some cases, noisy information, which is less relevant for the assessment of the overall economic activity. The sample for the consumer survey is based on random sampling.

There are numerous works that assess the role of BCS data for Europe as a whole and for particular countries and there is ample empirical evidence to support that this type of data are useful for forecasting macroeconomic variables, monitoring the economy and anticipate business cycles (see e.g. Bánbura and Rünstrler 2007; Carriero and Marcellino 2007; Claveria et al. 2007; Driver and Urga 2004; Mourougane and Roma 2003; Nahuis and Jansen 2004; Taylor and McNabb 2007).

For the practitioner who employs BCS indicators regularly, a number of questions arise in relation to their quality. Do these data reflect adequately the developments in the economy as a whole, as well as the developments at a sectoral level? Are there systematic deviations of expectations stated in the surveys from real economic variables that could signal biased responses? Are random departures of expectations from the corresponding real data observed to such an extent that undermine the reliability of BCS data? Are there aspects of BCS that need improvement? The purpose of this paper is to attempt to address these issues and, in general, to provide an assessment of the BCS data for Cyprus, using graphical representations and statistical analysis. Section 2 investigates the relation of an aggregate indicator of economic climate from BCS with aggregate output, i.e. GDP. Section 3 examines the link between BCS data at a sectoral level and a

number of relevant quantitative economic variables published by the Statistical Service. Section 4 concludes.

2. Overall economic activity

To examine whether BCS data contain information about future conditions in the Cyprus economy we plot, on Figure 1, the Economic Sentiment Indicator (ESI) for the period May 2008 to April 2010, together with the growth rate of GDP published quarterly during the same period.[1] The ESI summarises the economic climate in Cyprus as it is perceived and expected in the short-run by businesses and consumers.[2] The figure shows that there is a rather close link in the evolution of the two series over time. The ESI exhibits a downward trend from May 2008 to March 2009, which appears to precede the decline in the GDP growth that occurred between the second quarter of 2008 and the third quarter of 2009. Since the beginning of 2009, ESI fluctuates at low levels without showing any clear signs of recovery. At the same time, the uncertainty in the economic climate was also reflected in real economic activity, as no noticeable improvement in the GDP growth rate was recorded during the first quarter of 2010.

The ability of ESI to lead changes in economic activity over time can also be detected in Figure 2 where the quarterly changes of ESI lagged by one period outline the path of the quarter-on-quarter growth rate of GDP.

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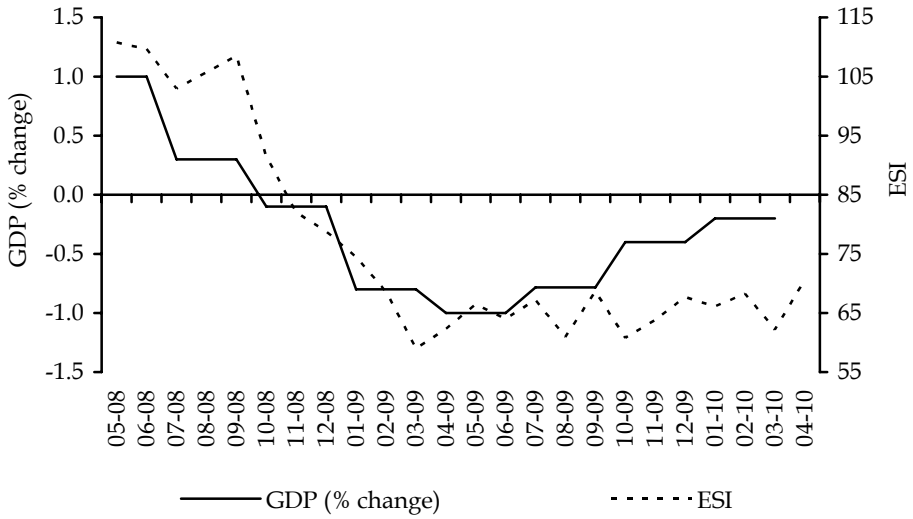
[1] GDP is expressed at constant 2005 prices (flash estimate) and the growth rate is computed with respect to the previous quarter (quarter-on-quarter).

[2] ESI is constructed using the weighted responses to a number of questions referring to the current economic situation and expectations of firms in the sectors covered and consumers.

FIGURE 1

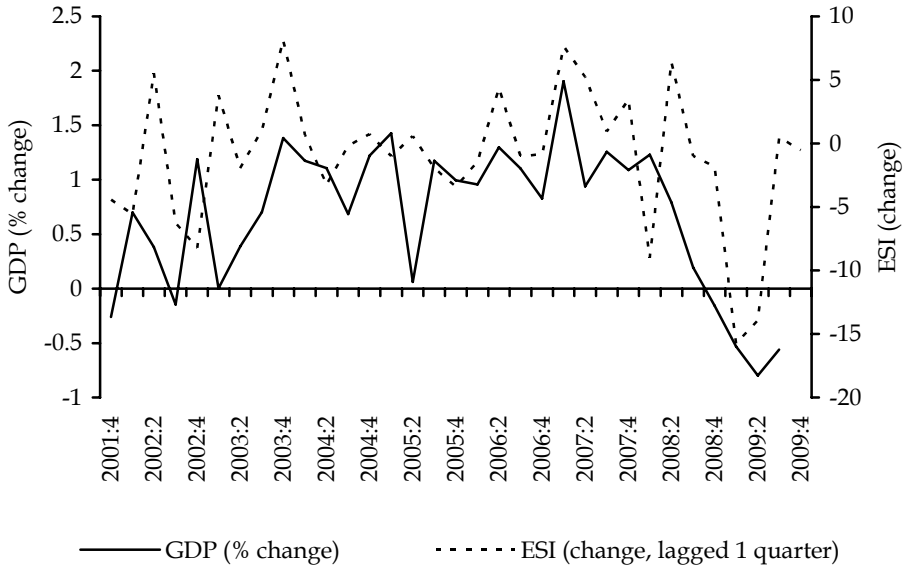
GDP growth vs. ESI



Source: Statistical Service and Economics Research Centre.

FIGURE 2

GDP growth vs. lagged ESI changes



Source: Eurostat and Economics Research Centre.

The relationship between ESI and GDP growth is explored further using regression analysis and quarterly data for the period 2001 to 2009. The results presented in Table 1 show that there is a positive relation between the ESI changes lagged by one quarter and the growth rate of output.[3, 4] In particular, a one-unit increase in the change of ESI in the previous quarter leads to 0.03 percentage points increase in the GDP growth of the current quarter. Assuming that the estimated relation between output growth and the ESI is stable over time, it could be used to gain some indication about future movements in the GDP growth, given that data on ESI for a particular quarter are available well in advance of the official release of the GDP for that quarter.

TABLE 1

Estimation results, dependant variable: GDP growth[1]

	Estimate (std error)
ESI (quarter-on-quarter change, lagged 1 quarter)	0.0313* (0.0108)
Constant	0.7706* (0.0908)
Model diagnostics[2]	
Residual autocorrelation (p-value)	0.6943
Residual ARCH (p-value)	0.7344
Number of observations	31

Notes: [1] Asterisk denotes statistical significance at 1% level.
[2] LM tests with two lags.

Both graphical and regression analysis confirm that the ESI contains leading information about aggregate economic activity, thus it can constitute a valuable tool for planning and timely implementation of economic policies.

[3] Prior to estimation, the variables were tested for unit roots. The Augmented Dickey-Fuller test indicated that the variables are stationary.

[4] Various models with different numbers of leads and lags, as well as contemporaneous values of the ESI changes were estimated before reaching the final specification shown in Table 1. The choice of the regressor lag length was based on the significance of the various lags/leads and current values included.

3. Sectors of economic activity

Next we focus on specific sectors of the economy to investigate the extent of the association between BCS data and a number of economic series published by the Statistical Service. The published economic data considered below relate to sectors of great importance for the Cyprus economy, such as construction, tourism and retail trade.

In Figures 3 – 7 the vertical axis on the left measures the economic series from the Statistical Service and the right vertical axis represents the corresponding economic climate indicators/variables in particular sectors from the BCS. The comparison of economic variables with BCS data in Figures 3 – 7 cover the period from May 2008 to April 2010.

Figure 3 refers to the subsector of services which relates to tourism. The confidence (business climate) indicator is constructed using the responses of managerial personnel in hotels and restaurants participating in the BCS to questions about their current business situation and their current and expected demand (turnover). The confidence indicator describes well the evolution of tourist arrivals with the turning points of the former appearing before the turning points in tourist arrivals.

In Figure 4 the confidence indicator in the construction sector is juxtaposed with the growth rate of local sales of cement.[5] The confidence indicator embodies the replies of firms in the construction sector about their current overall order books and their expected employment. In general, the two series move together but the BCS indicator seems less volatile than the growth rate of cement sales. The two noticeable departures of the published series from the relevant BCS indicator occurred in August 2008 and in August 2009 and they are possibly attributed to some seasonal factors accentuated by the downturn in the construction sector. This seasonal pattern is not reflected in the survey data. Moreover, two large positive deviations between actual and survey data were recorded in December 2008 and in March 2010. Despite the divergence in the abovementioned months, we notice a tendency of the growth rate of cement sales to return to the course of the sectoral indicator. From the observed behaviour of the two series we could infer that the confidence indicator could form a more reliable (less volatile) leading indicator of construction activity than the local sales of cement, as the former is affected

[5] The growth rates in Figure 4, 5 and 6 are computed with respect to the corresponding month of the previous year (year-on-year).

to a smaller extent by transient exogenous shocks that have limited impact on the aggregate output of the sector.

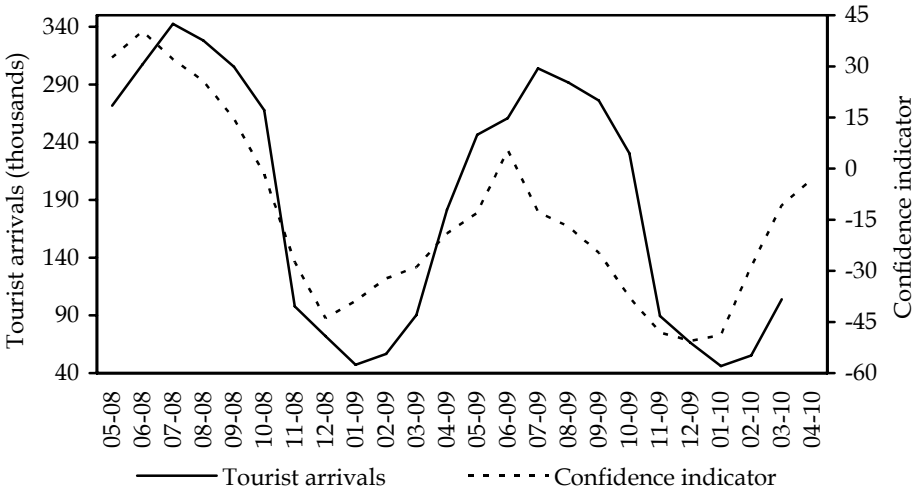
In retail trade (Figure 5), firms' assessment about expected sales in the next three months (i.e. the balance between the percentage of firms that expect increase from the percentage of firms that expect decrease) exhibit some degree of co-movement with the turnover value index of retail trade (percentage change) published by the Statistical Service. However, in some cases such as in July 2008, in January and May 2009 firms' sales expectations deviate significantly from the realisations recorded by the index of turnover value in retail trade.

Figure 6 plots expected and realised developments in the manufacturing sector. The sectoral confidence indicator from the BCS data describes rather well the downward trend but fails occasionally to provide leading indications for many turning points observed in the index of manufacturing production.

In Figure 7 we compare consumers' assessment regarding expected price increases over the next 12 months recorded by the BCS (i.e. the percentage of consumers that expect rapid increases in prices) with actual inflation. The diagram shows that consumers were able to predict the slowdown in inflation that began after the second half of 2008, but they delayed to incorporate the inflation increase observed in the last month of 2009 in their expectations.

FIGURE 3

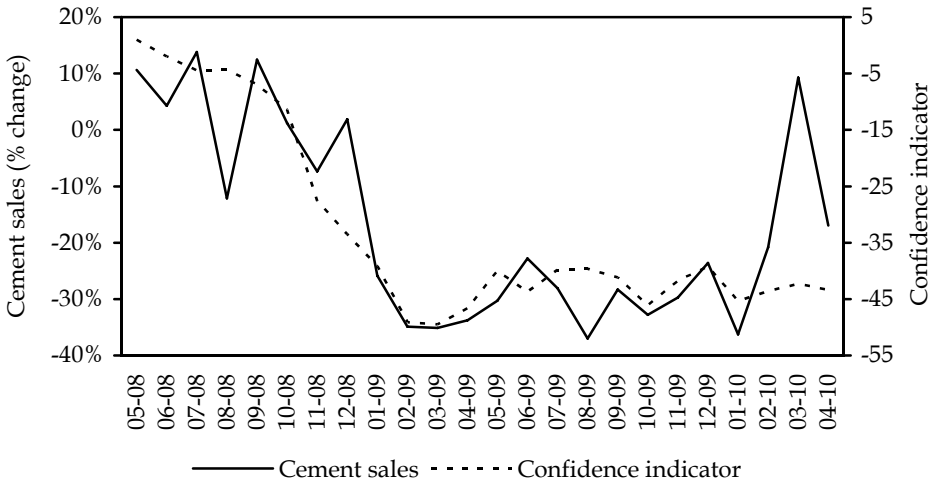
Tourist arrivals vs. confidence indicator (hotels and restaurants)



Source: Statistical Service and Economics Research Centre.

FIGURE 4

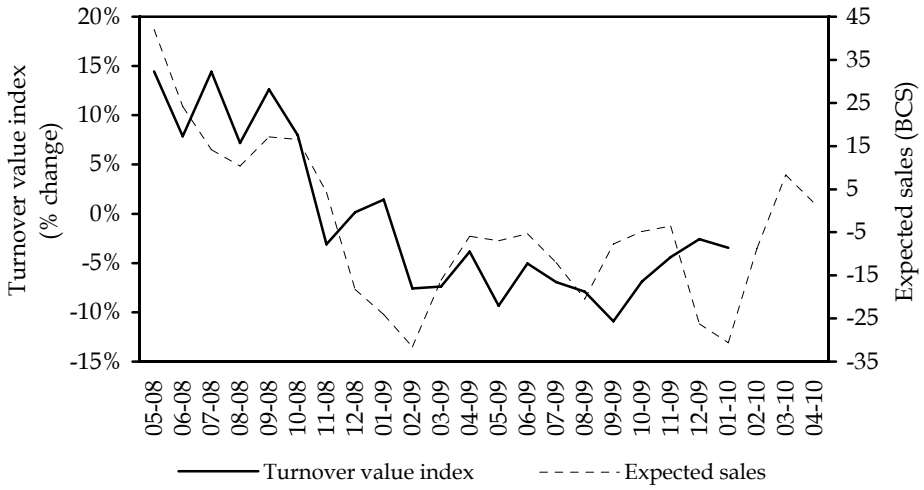
Cement sales vs. confidence indicator (construction)



Source: Statistical Service and Economics Research Centre.

FIGURE 5

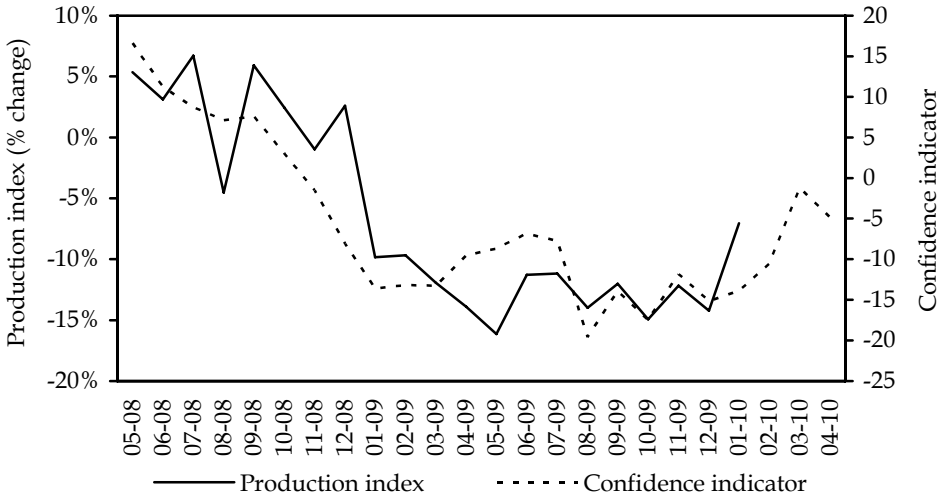
Turnover value index vs. expected sales (retail trade)



Source: Statistical Service and Economics Research Centre.

FIGURE 6

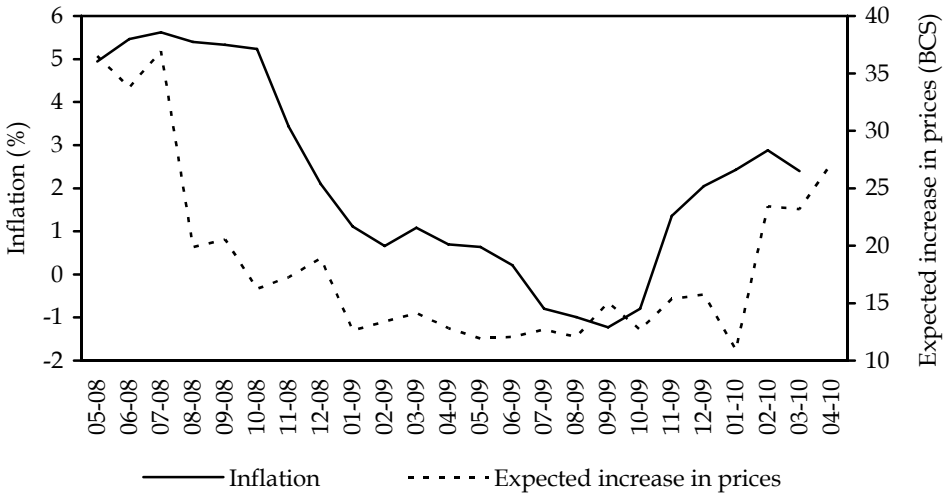
Production index vs. confidence indicator (manufacturing)



Source: Statistical Service and Economics Research Centre.

FIGURE 7

Inflation vs. expected increase in prices (consumers)



Source: Statistical Service and Economics Research Centre.

To quantify the degree of co-movement between survey and published economic variables for different sectors, we compute the pairwise correlation coefficients between the two sets of series. Table 2 shows the correlation between the published economic variables and various leads and lags of the BCS indicators.[6] For hotels and restaurants, retail trade and consumer prices, the BCS series used are available only after May 2008. For construction and industry we use the sector confidence indicators that have been available since May 2001 and May 2002 respectively. Thus, the correlations for these two sectors are computed for all available observations, as well as for the period before and after May 2008, when the change in the institute conducting the BCS in Cyprus took place.

In general, we obtain significant positive correlations between economic and survey variables. The value of the correlation peaks at the first lag for hotels and restaurants, the third lag for construction (period May 2002 - April 2010) and consumer prices and at the second lag for retail trade and industry (period May 2001 – April 2010). In construction and industry correlations are higher in the second sample period and they seem to dominate the results computed for the full sample. Moreover, in construction correlation is highest at fourth lag in the first period, while in the second period the value is maximized at zero lag.

The finding of high correlations of economic variables with lags of BCS variables is an indication that the latter lead the former. However, in the case of construction, retail trade and industry we also observe relatively large correlations between economic series and leads of survey variables. This would mean that the survey variables simply lag the economic series and this result should be investigated further.

[6] All transformations of the variables used for computing the correlation coefficients are stationary.

TABLE 2

Correlations between economic and BCS variables[1]

Economic variable[2]	Period	Survey variable (lags/leads) -4	-3	-2	-1	0	1	2	3	4
		Hotels and restaurants confidence indicator[3]								
Tourist arrivals	May 08-Apr 10	-0.06	0.20	0.51	0.72*	0.62*	0.31	-0.06	-0.44	-0.50
		Construction confidence indicator								
Local sales of cement	May 02-Apr 10	0.70*	0.72*	0.66*	0.70*	0.72*	0.69*	0.66*	0.71*	0.61*
	May 02-Apr 08	0.37*	0.35*	0.11	0.21	0.27	0.21	0.15	0.33*	0.15
	May 08-Apr 10	0.66*	0.73*	0.76*	0.79*	0.80*	0.74*	0.71*	0.64*	0.48
		Expected retail sales[4]								
Value index of retail trade	May 08-Apr 10	0.70*	0.75*	0.76*	0.71*	0.75*	0.69*	0.57*	0.62*	0.51
		Industry confidence indicator[5]								
Manufact. production index	May 01-Apr 10	0.68*	0.66*	0.75*	0.62*	0.62*	0.48*	0.36*	0.31*	0.23
	May 01-Apr 08	0.38*	0.19	0.43*	0.19	0.24	0.14	-0.02	0.05	-0.05
	May 08-Apr 10	0.71*	0.86*	0.88*	0.73*	0.67*	0.35	0.18	-0.12	-0.23
		Expected price increase[6]								
Inflation	May 08-Apr 10	0.86*	0.99*	0.86*	0.72	0.63	0.48	0.36	0.23	-0.11

Notes: [1] Asterisk denotes statistically significant correlation at 1% level.

[2] All economic variables are expressed in year-on-year growth rates except for tourist arrivals which are expressed in month-on-month growth rates.

[3] The indicator is expressed in month-on-month changes.

[4] The survey variable is given by the balance between the percentage of firms that expect increase from the percentage of firms that expect decrease in their sales.

[5] The indicator is expressed in year-on-year changes.

[6] The survey variable is given by the percentage of consumers that expect rapid increases in prices.

To disentangle the role of leads, lags and current values of survey variables in explaining quantitative economic variables we estimate regression models of the latter conditional on the former. The modelling strategy consisted of the estimation of a regression model for the economic variable on four lags and leads, as well as the current value of the BCS variable, and the subsequent exclusion of insignificant variables. The resulting models shown on Table 3 were chosen on the basis of significance of the BCS variables (i.e. insignificant lags, leads or current values were removed) and the statistical adequacy of the models based on diagnostic tests. The analysis was carried out for economic variables that correlate significantly with the leads of the survey variables as shown in Table 2. The results in Table 3 show that in all cases some lagged value of the survey variable influences positively and significantly the quantitative dependent variable. Moreover, the adjusted coefficient of determination (adjusted R^2) shows that the survey variables explain over 60% of the variation in the published economic variables, which indicates that the BCS data have considerable explanatory power and predictability with respect to quantitative series.

In construction we also observe an impact of the lead of the confidence indicator three months ahead on the local sales of cement (percentage change), although this impact is insignificant in the second sample period (May 2008 – April 2010). On the other hand, the effect of the lagged construction confidence indicator on the economic variable becomes larger during the period May 2008 – April 2010, compared to the effect obtained for the full sample period. The significant forward value of confidence indicator in construction arises possibly because the dependent variable, namely the local sales of cement, is a known leading indicator for construction activity that incorporates similar forward-looking information with the confidence indicator. Thus, the construction confidence indicator can also be used as a reliable leading indicator for construction activity, since it is available before the official release of the local cement sales for a given month.

In retail trade current expectations about retail sales, as well as expected sales three months ago affect the current turnover value index (percentage change) of retail trade, with the lagged survey variable having a slightly larger effect than the current value on the economic variable.

As far as manufacturing is concerned, the results showed that the only significant effect on the current manufacturing production index (percentage change) comes from the industry confidence indicator two periods before and this effect doubles for the second sample period.

TABLE 3

Estimation results[1]

	Dependent variable[2]		
	Local sales of cement	Value index of retail trade	Manufact. production index
Constant	0.0716** (0.0131)	0.0021** (0.0005)	0.0109* (0.0045)
Construction confidence indicator, lead 3	0.0020* (0.0009)		
Construction confidence indicator, lag 3	0.0021* (0.0009)		
Construction confidence indicator, lead 3 (May 08-Apr 10)	0.0006 (0.0015)		
Construction confidence indicator, lag 3 (May 08-Apr 10)	0.0043** (0.0016)		
Expected retail sales[3]		0.0016* (0.0006)	
Expected retail sales, lag 3		0.0021** (0.0005)	
Industry confidence indicator[4], lag 2			0.0026** (0.0006)
Industry confidence indicator, lag 2 (May 08-Apr 10)			0.0026** (0.0008)
Model diagnostics[5]			
Residual autocorrelation (p-value)	0.9781	0.3517	0.3840
Residual ARCH (p-value)	0.8907	0.7923	0.9073
Adjusted R^2	0.6641	0.6535	0.6024
Number of observations	90	19	92

Notes: [1] The symbols "*" and "**" denote statistical significance at 5% and 1% level respectively. Standard errors are in parentheses.
[2] All dependent variables are expressed in year-on-year growth rates.
[3] The survey variable is given by the balance between the percentage of firms that expect increase from the percentage of firms that expect decrease in their sales.
[4] The indicator is expressed in year-on-year changes.
[5] LM tests with two lags.

The leading properties of survey variables with respect to economic variables, together with the fact that BCS data are timely available, as opposed to the various economic activity quantitative indicators published with a delay, confirm that BCS data are a useful tool for monitoring and

responding to economic developments in real time, as well as a valuable input in forecasting output and prices.

4. Concluding remarks

The Business and Consumer Surveys (BCS) that have been conducted by the Economics Research Centre, in collaboration with RAI Consultants Public Ltd (as part of the Joint Harmonised European Union Programme of Business and Consumer Surveys) contain information about expected developments in various macroeconomic series. This paper examines the usefulness of these survey data as a tool for monitoring the economy, as well as an input in econometric models that will ultimately be used for forecasting economic variables.

Both descriptive and econometric analysis showed that there is a strong link between the ESI and the GDP growth for Cyprus and in particular the changes in the ESI appear to lead developments in output growth. We estimated that a drop, for example, of 10 points in the ESI change this quarter will lead to lower GDP growth by about 0.3-0.4 percentage points in the next quarter. This estimate can be used just as a rule of thumb and it does not provide an accurate forecast of GDP growth.

The analysis for particular sectors of economy showed that BCS data exhibit high correlations with the corresponding quantitative variables published by the Statistical Service and in most cases the changes in survey variables lead the changes in the relevant economic variables. Overall, the BCS data capture the trends in the quantitative variables, even though at times firms' (e.g. in retail trade and industry) and consumers' expectations are not realised, as the comparison with published quantitative variables revealed. Nevertheless, the observed departures of expectations from realisations do not appear to signify biases in the results. In other words, firms and consumers participating in the BCS might not always provide accurate predictions but their stated expectations do not systematically overestimate or underestimate reality. Furthermore, we should mention that the divergence of expectations from realisations in some sectors observed towards the end of the sample period might be due to the uncertainty because of the economic crisis that has began affecting Cyprus since the last quarter of 2008.

The examination at a sectoral level uncovered the importance of analysing the association to a greater depth of more disaggregate BCS data with both aggregate economic variables and relevant quantitative economic variables relating to sectors and subsectors of the economy, as there might exist useful leading information at a more disaggregate level of survey

variables. Such disaggregate information is not utilised in the overall (i.e. Economic Sentiment Indicator) or the sector-specific confidence indicators. This is an investigation we intend to complete in the near future.

The analysis revealed that the results of the BCS reflect adequately the developments occurring in the Cyprus economy. There is therefore evidence that both the source of information collected (i.e. firms and consumers taking part in the surveys) and the procedure followed in gathering the data are reliable. The Economics Research Centre intends to exploit the useful information in BCS data in econometric modelling for the computation of short-term forecasts of macroeconomic indicators for the Cyprus economy. At the same time, the effort to produce and to further enhance the high quality of survey data will be continued.

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