# CONFIDENCE AND ECONOMIC ACTIVITY: THE CASE OF PORTUGAL\*

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### ABSTRACT

The idea that aggregate economic activity might be driven in part by confidence and changes in expectations is not new in economics. Earlier discussions date back to Pigou (1927) and Keynes (1936). Over the last few decades, boom and bust cycles in industrialized countries gave an impulse to explore further the importance of changes in expectations as sources of business cycle fluctuations. This article estimates a structural VAR to identify the effects of confidence shocks in Portugal. Shocks to economic confidence and economic sentiment account for a non-negligible fraction of variation in economic activity. The results are robust to the use of alternative measures of economic activity and various survey indicators.

### 1. Introduction

In this article we explore the role of confidence and optimism for business cycle fluctuations in Portugal. During the financial and economic crisis, business and consumer confidence indicators in Portugal have fallen dramatically. Since the beginning of the year, confidence indicators displayed an upward path. It is thus important to understand to which extent survey indicators reveal some useful information about future economic activity in Portugal.

Consumer confidence measures the degree of optimism about consumers' personal financial situation and the overall shape of the economy. Thus, changes in consumers' confidence through their impact on consumers' consumption and investment decisions, may have aggregate economic effects. Changes in agents' perception about future economic developments could reflect psychological factors or could be related to the release of information (news) regarding the economy's future state not captured by economic fundamentals and, thus, not summarized by contemporaneous macroeconomic variables. Changes in consumer and business confidence may therefore become an independent source of macroeconomic fluctuations.

The idea that aggregate economic activity might be driven in part by confidence and changes in expectations is not new. According to Pigou (1927) "The varying expectations of business men ... constitute the immediate cause and direct causes or antecedents of economic fluctuations (...) wave-like swings in the mind of business world between errors of optimism and errors of pessimism"; in brief, expectations determine business cycles. Keynes (1936) also argues that waves of optimism and pessimism may drive business cycles: "Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits

<sup>\*</sup> We are grateful to Nuno Alves and Antonio Antunes for useful comments and suggestions on this article. The opinions expressed are those of the authors and not necessarily those of Bank of Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.

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a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities".

Over the last few decades, boom and bust cycles in industrialized countries gave an impulse to explore further the importance of changes in expectations as sources of business cycle fluctuations. Since Beaudry and Portier (2006) showed that business cycles in the data are driven primarily by changes in agents' expectations about future technological growth, several authors have highlighted the importance of expectation-driven cycles as a source of business cycle fluctuations. Recent empirical work indicates that survey data provide evidence on the importance of economic confidence and expectations for business-cycle fluctuations. Our analysis follows Leduc and Sill (2012) and Barsky and Sims (2012) in introducing survey and expectation data into an otherwise standard VAR model.

Leduc and Sill (2012) estimate a structural vector auto-regression model (VAR) using survey data of unemployment rate expectations from alternative surveys for the US. By including the actual unemployment rate, inflation and the 3-month Treasury Bill rate, they show that innovations to unemployment rate expectations contribute significantly to current economic fluctuations. Similarly, Barsky and Sims (2012) estimate a three-variable VAR model, which includes GDP, real consumption and survey data from the Michigan Survey, to disentangle the causal effect of animal spirits on economic activity from fundamental information about future economic activity. They find that innovations to the confidence indicators have important real effects. Lambertini *et al.* (2013) show that unexpected changes in forward-looking variables from the University of Michigan Survey of Consumers influence housing market dynamics and aggregate fluctuations. Importantly, D'Agostino and Mendicino (2013) document the role of time variation in the transmission of expectation-driven cycles.

In line with the previous papers' findings, we show that shocks to forward-looking survey variables also account for a sizeable fraction of variation in economic activity in Portugal. In particular, unexpected changes in confidence generate a macroeconomic boom as in Leduc and Sill (2012). Shocks to economic confidence and economic sentiment account for a non-negligible fraction of variation in economic activity. The results are robust to the use of alternative measures of economic activity and various survey indicators.

### 2. Survey Indicators

This article uses data from the monthly business and consumer surveys of the European Commission. Business and consumer surveys provide judgements and anticipations concerning several dimensions of economic activity in the different sectors of the economy: industry, services, construction and retail trade, as well as consumers. The surveys are largely qualitative. See table 1 for a list of variables covered in the monthly business and consumer surveys. In this article we mainly focus on the industry and consumer surveys.

The consumer survey collects information on households' spending and savings intentions and also assesses their perception of the general economic and financial situation. The survey is designed around four topics: household's financial situation, general economic situation, savings and major purchases. About 2100 consumers are surveyed every month in Portugal. In turn, the industry survey refers to an assessment of recent trends in production, order books and stocks and expectations about production, selling prices and employment in different sectors. See table 2 (panel a) for the sample size for each sector.

Survey variables report the results aggregated in the form of "balances" of the difference between the percentage of respondents giving positive and negative replies. The balance series are seasonally adjusted and then used to calculate Confidence Indicators, *i.e.* composite indicators that reflect overall perceptions and expectations for each surveyed sector. Each confidence indicator is calculated as an average of selected answers. The consumer confidence indicator (CCI) is the arithmetic average of the balances (in percentage points) of the answers to the questions on the financial situation of households (Q2), general economic situation (Q4), unemployment expectations (Q7 with inverted sign) and savings

# Table 1

SURVEY VARIABLES	
Type of Survey	Monthly Questions
Industry	Q1: Production, past 3 months
	Q2: Production, next 3 months(*)
	Q3: Total order books
	Q4: Export order books(*)
	Q5: Stocks of finished products(*)
	Q6: Selling prices, next 3 months
	Q7: Firm's employment, next 3 months
Construction	O1: Business activity, past 3 months
	$\Omega^2$ : Eactors limiting production
	03: Domestic order books(*)
	$Q_3$ . Defines the order books( $\gamma$ ) $Q_4$ : Firm's employment next 3 months(*)
	05: Selling prices next 3 months
Retail Trade	Q1: Business activity, past 3 months(*)
	Q2: Business activity, next 3 months(*)
	Q3: Stocks of goods
	Q4: Orders placed with suppliers, next 3 months(*)
	Q5: Firm's employment, next 3 months
Services	Q1: Business situation, past 3 months(*)
	Q2: Turnover, past 3 months(*)
	Q3: Turnover, next 3 months(*)
	Q4: Firm's employment, past 3 months
	Q5: Firm's employment, next 3 months
Consumers	Q1: Financial situation, past 12 months
	Q2: Financial situation, next 12 months(*)
	Q3: General economic situation, past 12 months
	Q4: General economic situation, next 12 months(*)
	Q5: Consumer prices, past 12 months
	Q6: Consumer prices, next 12 months
	Q7: Unemployment, next 12 months(*)
	Q8: Major purchases of durable consumption goods, current environment
	Q9: Major purchases intensions, next 12 months
	Q10: Savings, current environment
	Q11: Saving intentions, next 12 months(*)
	Q12: Capacity to save

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Source: European Commission Services. Note: (\*) indicates the variables included in the sectorial confidence index.

# Table 2

SURVEY CHARACTERISTICS: PORTUGAL							
	Consumer	Industry	Services	Retail Trade	Construction		
(a) Sample Sizes	2100	1200	960	560	320		
(b) ESI Weight	20%	40%	30%	5%	5%		

Source: European Commission.

(Q11), all over the next 12 months. The industrial confidence indicator (ICI) is the arithmetic average of the balances (in percentage points) of the answers to the questions on order books (Q2), stocks of finished products (Q4) and production expectations (Q5 with inverted sign).

The results for the five surveyed sectors are also aggregated into the economic sentiment indicator (ESI) summarizing developments in all sectors. The Economic Sentiment Indicator is built applying the weights reported in table 2 (panel b) to the individual component series of the composite indicators. The weights reflect the representativeness of the sectors and the performance with respect to GDP growth. The weights do not apply to the confidence indicators themselves but to the standardized individual component series as denoted by (\*) in table 1.

Chart 1 displays the three standardized indicators. Values above 100 indicate above-average position whereas values below 100 indicate a below average position. Table 3 reports the results of a Granger causality test. Both confidence indicators and the economic sentiment indicator contain statistically

GRANGER CAUSALITY TEST		
Lags Null Hypothesis	F-statistic	Prob.
Industrial Production does not Granger Cause CCI	1.1342	[0.3320]
CCI does not Granger Cause Industrial Production	2.2112**	[0.0114]
Industrial Production does not Granger Cause ESI	1.3337	[0.1986]
ESI does not Granger Cause Industrial Production	0.5731***	[0.0030]
Industrial Production does not Granger Cause ICI	1 1261	
Industrial Froduction does not Granger Cause ici	1.1501	[0.3305]
ICI does not Granger Cause Industrial Production	2.2259***	[0.0108]
Unemployment does not Granger Cause CCI	0.7678	0.6835]
CCI does not Granger Cause Unemployment	2.5803***	[0.0029]
Unemployment does not Granger Cause ESI	1.4289	[0.1519]
ESI does not Granger Cause Unemployment	3.6151***	[0.0000]
Unemployment does not Granger Cause ICI	1.01127	[0.4384]
ICI does not Granger Cause Unemployment	3.5959***	[0.0000]

Table 3

Sources: European commission and authors' calculations.

Notes: CCI=Consumer Confidence Indicator; ICI=Industrial Confidence Indicator; ESI=Economic Sentiment Indicator. Sample: 1987:1 to 2013:9. 12Lags; \*\*\* 1%, \*\* 5%, \* 10% significance.



Source: European Commission.

significant information for economic activity measured by the index of industrial production or by the unemployment rate. In fact, the hypothesis that each survey variable does not Granger cause economic activity can be rejected at the one or five percent significance level. On the contrary, lags in economic activity do not contain significant information to explain either current consumer confidence or the economic sentiment indicators.

## 3. The Empirical Model

We estimate a standard VAR model

$$A_{0}Y_{t} = c + A(L)Y_{t-1}\varepsilon_{t}$$

where  $Y_t$  is the vector of endogenous variables,  $A_0$  is the matrix of contemporaneous interaction, A(L) is a matrix polynomial in the lag operator L and  $\varepsilon_t$  is the vector of structural shocks with covariance matrix  $\Sigma$ . In addition to the survey variables, the baseline VAR model includes three endogenous variables: a measure of economic activity, the CPI inflation rate and the nominal interest rate. See the Data Appendix for a description of the macroeconomic variables. The model is estimated on quarterly data over the sample period January 1987 to September 2013. Relying on the Schwartz Information Criterion we include up to two lags of each of the endogenous variables.

Responses from the monthly surveys are collected in the first two-three weeks of each month and sent to the Commission by the end of the reference month. At the time in which the survey is filled in the respondents do not know the unemployment rate and industrial production of the same month. For instance, up to the first two weeks of February the respondents in Portugal know the unemployment rate and industrial production of December and the CPI of January. This timing is consistent with the use of a recursive (*i.e.* Cholesky) identification scheme that orders the survey variable first, as in Leduc and Sill (2012). Thus, we assume no contemporaneous response of the survey variable to shocks to the other variables in the system.<sup>1</sup> The ordering of economic activity, inflation, and the interest rate is standard from the monetary transmission literature; see for instance Christiano *et al.* (1997).

#### 4. Economic Activity and Changes in Survey Data

Consumer confidence measures the degree of optimism about consumers' personal financial situation and the overall shape of the economy. Changes in consumers' confidence through their impact on consumers' consumption and investment decisions may have aggregate economic effects. Chart 2 (top panel) shows the impulse responses to a positive innovation to CCI in the VAR that includes industrial production as a measure of economic activity.

An increase in consumer confidence reflects an increase in the fraction of consumers with positive opinion about general economic conditions, unemployment or their own financial situation in the next 12 months, relative to the fraction of consumers with a negative opinion. Thus, we interpret positive surprise movements in CCI as an increased perception by consumers of future favorable changes in business conditions. On impact, a shock to CCI has a very small effect on all variables. The initial responses are not significantly different from zero at the ninety per-cent confidence level. However, the initial small impact is followed by a significant hump-shaped response in production that peaks after about one year. Inflation also rises, but its response is significant only after about six months, and it peaks a few months after the peak in industrial production.

<sup>1</sup> One implements this assumption by defining the matrix  $A_0^{-1}$  to be the lower Cholesky decomposition of  $\Sigma$  .

One standard deviation increase in each survey variable. Top Row: Consumer Confidence Indicator (CCI); Middle Row: Economic Sentiment Indicator (ESI); Bottom Row: Industry Confidence Indicator (ICI). Error bands correspond to 95%.

Due to feedback effects, the confidence indicator displays an upward path for about 6 months after the initial shock. Indeed, the expansionary macroeconomic effect of the initial shock generates a further increase in consumers' confidence. If the balance of positive and negative responses regarding future economic and financial conditions increases by 1 point, industrial production increases by around 5 pp after 6 months and 10 pp after 18 months.

We provide further evidence of the real effects of innovations to CCI by investigating the robustness of the results to the use of the unemployment rate. The top panel of chart 3 shows that the effect of a positive shock to CCI on the unemployment rate is not significant on impact but it becomes negative and significant after about two quarters. Further, the unemployment rate declines and remains below zero for several quarters. The use of the unemployment rate as a measure of economic activity has no effect on the qualitative responses of the other variables.



## Chart 2

Notes: One standard deviation increase in each survey variable. Top Row: Consumer Confidence Indicator (CCI); Middle Row: Economic Sentiment Indicator (ESI); Bottom Row: Industry Confidence Indicator (ICI). Error bands correspond to 95%.

Sources: European Comission, OECD and authors' calculations.



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Shocks to the CCI are also quantitatively important for macroeconomic fluctuations. Table 4 reports the percentage of unconditional variance of the k-step-ahead forecast error in all endogenous variables due to this shock, for k = 1, 2, 3 and 4 years. Unexpected changes in Consumer Confidence account for above 20 per cent of the forecast error variance of industrial production over a longer horizon.

We also consider the effects of exogenous changes in the industrial confidence indicator and in the economic sentiment indicator. An increase in the ICI reflects an increase in the fraction of respondents with a positive opinion regarding production, the export order books and/or the stocks of finished products over the next 3 months. The ESI instead summarizes developments in all sectors. The responses to innovations to the ESI and the ICI are reported in the middle and bottom panel of Charts 2 and 3. Like a shock to CCI, a shock to ESI generates hump-shaped responses in production and inflation. The unemployment rate also displays a prolonged decline. After the first few months, the responses are all significant at the ninety percent confidence level.

Regarding the importance of shocks to survey indicators, we find that they account for a non-trivial fraction of forecast error variance of economic activity, especially over longer horizons. In particular, shocks

### Table 4

VARIANCE DECOMPOSITION								
	Industrial Production				Unemployment Rate			
	CCI	ICI	ESI		CCI	ICI	ESI	
12m	8.66	5.99	3.66	12m	11.30	17.23	15.33	
24m	22.33	13.05	10.66	24m	31.28	36.37	33.79	
36m	24.51	13.17	15.53	36m	34.57	36.52	41.35	
48m	23.65	12.36	17.07	48m	34.48	36.09	42.40	

Sources: European Commission, OECD and authors' calculations.

Notes: CCI=Confidence Indicator; ICI= Industrial Confidence Indicator; ESI=Economic Sentiment Indicator.

to CCI and ICI have about the same importance in accounting for variations in the unemployment rate, whereas ESI accounts for a slightly larger fraction of volatility in this variable. Shocks to forward-looking survey variables account for between 12 and 24 per cent of the 4-year-ahead forecast error variance of industrial production, and between 30 and 40 per cent of the unconditional variance the unemployment rate.

Summarizing, shocks to forward-looking survey variables generate a macroeconomic boom as in Leduc and Sill (2012). Shocks to economic confidence and sentiment account for a non-negligible fraction of variation in economic activity. The results are robust to the use of alternative measures of economic activity and various survey indicators.

One standard deviation increase in each survey variable. Top Row: Consumer Confidence Indicator (CCI); Middle Row: Economic Sentiment Indicator (ESI); Bottom Row: Industry Confidence Indicator (ICI). Error bands correspond to 95%.

## 5. CONCLUSION

We study the role of Confidence and Economic Sentiment Indicator for business cycle fluctuations in the Portuguese economy. To this purpose, we estimate a VAR model which, in addition to survey variables, also includes the inflation rate and the nominal interest rate and a measure of economic activity, such as industrial production or the unemployment rate. We use monthly data from January 1987 to September 2013. Our results show that an unexpected increase in consumers' perceived confidence raises industrial production and pushes up the inflation rate. Similar results can be obtained if we focus on the unemployment rate. Measures of economic sentiment and industrial confidence confirm the same results.

### REFERENCES

- Barsky, R. B., Sims, E.R., (2012). "Information, animal spirits, and the meaning of innovations in consumer confidence". *American Economic Review* 102, 1343-1377.
- Beaudry, P., Portier, F., (2006). "Stock prices, news and economic fluctuations". *American Economic Review* 96, 1293-1307.
- Christiano, L. J. Eichenbaum, M Evans, C (1997). Monetary shocks: what have we learned, and to what end?, in: Taylor, J.B., Woodford, M. (Eds.), Handbook of Macroeconomics. Elsevier, Amsterdam, pp. 65-148.
- D'Agostino, A., Mendicino, C., (2013). Expectation-Driven Cycles: Time-varying Effects. Mimeo.
- Fujiwara, I., Hirose, Y., Shintani, M., (2011). "Can news be a major source of aggregate fluctuations? A bayesian dsge approach". Journal of Money, Credit and Banking 43, 1-29.
- Keynes, J. M., (1936). The General Theory of Employment, Interest and Money. London: Macmillan.
- Khan, H., Tsoukalas, J., (2012). "The quantitative importance of news shocks in estimated DSGE models". Journal of Money, Credit and Banking 44, 1535-1561.
- Lambertini, L., Mendicino, C., Punzi, M. T. (2013). "Expectation-Driven Cycles in the Housing Market: Evidence from Survey Data". *Journal of Financial Stability* 9(4), 518-529.
- Leduc, S., Sill, K., (2012). "Expectations and economic fluctuations: an analysis using survey data". *Review of Economics and Statistics, forthcoming.*
- Milani, F., Treadwell, J., (2012). "The effects of monetary policy news and surprises". *Journal of Money, Credit and Banking* 44, 1667-1692.

Pigou Arthur, (1927), Industrial Fluctuations. London: MacMillan and Co., p.29.

Schmitt-Grohé, S., Uribe, M., (2012). "What's news in business cycles". Econometrica 80, 2733-2764.

## **Data Appendix**

### **Macro Series**

- Industrial Production : Production/Industry (Total industry excluding construction). Unit 2005Y. Source: OECD.
- Unemployment : Labour (Registered unemployment/Level/Total). Source: OECD.
- Inflation : Consumer Price Index/All items. Unit 2005Y. Source: OECD.
- Interest Rate : Money Market Portugal Interbank 3-month Yield, average of observations through period (Percent per annum ).

## **Survey Series**

- Consumer Confidence Indicator (CCI): Consumer opinion surveys/Confidence indicators/Composite indicators/OECD Indicator, Normal = 100 SA. Source: European Commission, ECFIN.
- Industry Confidence Indicator (ICI): Business tendency surveys (manufacturing)/Confidence indicators/ Composite indicators/OECD Indicator, Normal = 100 SA Source: European Commission, ECFIN.
- Economic Sentiment Indicator (ESI): Expectations about production, selling prices and employment in different sectors. Source: European Commission, ECFIN.