

Economic sentiment shocks and fluctuations in economic activity in the Euro Area.

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Abstract

This study contributes to the literature on business cycle analysis by integrating survey data into an analysis of the euro area business cycle . More specifically we assess to which extent the euro area business cycle is also affected by shocks in consumer and producers business cycle evaluations, as summarized by the Economic Sentiment Indicator of the European Commission. We develop a VAR model to analyse these propagations of shocks to economic sentiment, industrial production, retail sales and unemployment in the euro area.

JEL Codes: C22, E32, E66, F42

Keywords: euro area, business cycle measurement, survey data, economic sentiment indicator

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1. Introduction

The concept of “economic sentiment” and changes therein -while intuitive in real world to citizens, businessmen, practitioners in financial markets and politicians e.g.- has not found clear footing in mainstream modern macroeconomics. Clearly, controversial economists such as Keynes and Minsky and others, did recognize the presence of sentiment and put a lot of emphasis on sudden sentiment changes to explain business cycle fluctuations in their writings, but their ideas have not been fully appreciated/incorporated into mainstream economics. One of the problem with such explanations, results from the unclear, undefined content of the concept and related, it is not obvious to observe and quantify such a variable.

Keynes links sentiment to “the state of long-term expectation” and “the state of confidence” and his interpretation is usually referred to as “animal spirits”.¹ In Keynes’ analysis, sentiment of consumers and producers plays a key role in explaining economic fluctuations. The interpretation of economic sentiment as an additional macroeconomic variable may appear strange at first sight, but would come close to interpretations of e.g. Keynes’s “animal spirits”. While basically gone lost in mainstream interpretations of Keynes’s work, it is clear that he himself attached strong importance to the role of consumer and producer sentiment in the economy as a sort of gyrating forces, both in case of booms and recessions.

Even if the economic sentiment as a concept may not have been embraced entirely in mainstream economics, the recent financial and economic crisis appears to be fraught with aspects can appear to be related to sentiment. A strong decline in economic sentiment has certainly contributed to the size and rapidness outburst of financial turbulence and the substantial economic slowdown. Clearly if economic sentiment falters, the first adjustments that agents typically make is to slowdown spending, shift out of risky assets to money, firms may stop hiring and postpone capital investment. Output would fall and unemployment rise. On its turn, if economic agents are made/getting more aware of financial turmoil, economic slowdown and adverse unemployment dynamics, –even it would not directly affect themselves-, they are likely to revise downward economic sentiment, adding additional momentum to the slowdown.

In a recent book, Akerlof and Shiller (2010) reconsider the role of “animal spirits” during the financial crisis and refine the concept. In their approach, “animal spirits” are linked to confidence, fairness, corruption and bad faith, money illusion and stories. Changes in these aspects may trigger a change in animal spirits and economic sentiment in general. Cycles of overoptimism and overpessimism of economic agents may then be driving (speculative) boom-bust cycles along the lines of Minsky’s Panics and Manias. Traditional/mainstream macroeconomics mostly would ignore these more psychological factors and their effects on business cycle fluctuations.

This study includes economic sentiment into an analysis of the business cycle fluctuations in the euro area. In this sense it also seeks to contribute to increase our understanding of the recent period of financial turmoil and economic slowdown in the euro area by giving an own role to economic sentiment fluctuations in explaining business cycles fluctuations. In order to so, we include the Economic Sentiment Indicator (ESI) into a small-scale VAR model that also contains industrial production, retail sales and unemployment. The ESI is an indicator of economic sentiment and confidence based on a broad scale survey data analysis and it will be used as our proxy for sentiment and its effects. More specifically we assess to which extent sentiment shocks affect business cycle conditions in the euro area . This is done by analysing the impulse response functions and variance error decompositions of the propagations of shocks

¹ In Chapter 12 of the General Theory, Keynes notes: “We may sum up the state of psychological expectation which covers the latter [i.e. future events] as being *the state of long-term expectation*; — as distinguished from the short-term expectation upon the basis of which a producer estimates what he will get for a product when it is finished if he decides to begin producing it to-day with the existing plant, which we examined in Chapter 5.”

and

“The state of long-term expectation, upon which our decisions are based, does not solely depend, therefore, on the most probable forecast we can make. It also depends on the *confidence* with which we make this forecast — on how highly we rate the likelihood of our best forecast turning out quite wrong. If we expect large changes but are very uncertain as to what precise form these changes will take, then our confidence will be weak. The state of confidence, as they term it, is a matter to which practical men always pay the closest and most anxious attention. But economists have not analysed it carefully and have been content, as a rule, to discuss it in general terms.”

to economic sentiment, industrial production, retail sales and unemployment in the euro area and EU. In addition, the setup allows also to investigate the impact of economic conditions on economic sentiment. It is clear that apart from such psychological factors, economic sentiment is also likely to be affected itself by business cycle conditions.

We also contribute to the analysis of survey data in general by providing an additional application of these data. Business cycle analyses use business and consumer survey data on economic agents' judgements about current and future economic developments routinely even if these data have a number of conceptual limitations compared to hard business cycle data. Their assessment provide policy-makers, economists and business managers with useful information about the current state of the economy and may be used in forecasting short-term developments. In our paper, survey data are used as a proxy of economic sentiment and shown how it can usefully included in a small VAR model of the business cycle.

Our analysis is also related on a recent literature that analyses 'news' shocks in financial markets, following Beaudry and Portier (2007) and Milani (2007). These expectational shocks generate waves of optimism (or pessimism) with otherwise rational agents who then gradually learn about the true state of the economy and then readjust their expectations. Clearly, economic sentiment is also linked to information flows and its processing by agents. In particular, we find it intuitively appealing that notwithstanding a rational approach to news in general, economic agents may start to frame news in case of periods with strongly declining or rising economic sentiment. In that case, economic agents overemphasise news that is in line with their sentiment and tend to downplay news that is not consistent their sentiment. Such a subjective filtering or 'framing' may than also be one of the factors at the base of large sentiments shifts. While the 'news' shock literature assumes rational agents that are subject to expectational shocks, in the economic sentiment context an even broader interpretation is possible that does not necessarily only rely on news, and its interpretation by otherwise rational agents.

At the same time, we argue, innovations to economic sentiment can be seen as an independent source of macroeconomic shocks: shocks to consumer and producer confidence may induce changes in the consumption and productions decisions made by them. This issue is very relevant in the context of the current recession as the sudden drop in consumer and producer confidence due to the turmoil in the financial markets and banking sector can be considered as crucial factors in the transmissions from the financial shocks to real economic activity, in particular output, sales and employment. In that sense, economic sentiment indicators may guide policymakers in a similar way as inflation expectations: sentiment indicators may provide valuable information for macroeconomic policy design by providing indications of the expectations of consumers and producers.

Implicitly or explicitly, survey data are usually assumed to be leading variables relative to business cycles (typically a lead of approximately 4 to 6 months is assumed by analysts): following the notions of the rational expectations hypothesis, the expectations of consumers and producers could be interpreted as unbiased estimators of the business cycle as rational agents will process all relevant information in their decision making. This also explains the usefulness of using such survey data in business cycle analysis: this property of leading indicator would provide a gauge about the business cycle in the near future. At an empirical level, the degree of leading in survey data, however, is less of a certitude and subject to empirical verification: the amount of leading may differ between countries and subject to change over time. In fact, one can not rule out that lagging elements are also entering survey data as some agents may base their expectations of current and future business cycle dynamics about the experiences in the (recent) past, therefore forming expectations and reacting more along the line therefore of the adaptive expectations hypothesis.

Section 2 establishes the main stylised facts concerning business cycles and economic sentiment in the euro area. Section 3 analyses fluctuations in the business cycle and economic sentiment using a VAR model of the Euro Area business cycle. Section 4 concludes the paper by summarising the main findings.

2. Business cycles and economic sentiment in the Euro Area

In this section, patterns of the business cycle and business cycle sentiment in the euro area and EU are analysed using Eurostat data. Our dataset encompasses the EU Commission's economic sentiment indicator (ESI), and three other business cycle indicators: industrial production, retail sales and unemployment. Data are monthly and collected for all EU27 countries and the euro area and EU27 aggregate for the period 1990M1-2010M3.

The ESI is composed of the industrial, services, consumer, construction and retail trade confidence indicators; the industrial confidence indicator has a weight of 40%, the services confidence indicator a weight of 30%, the consumer confidence indicator a weight of 20% and the two other indicators a weight of 5% each. Confidence indicators are arithmetic means of seasonally adjusted balances of answers to a selection of questions closely related to the reference variable they are supposed to track (e.g. industrial production for the industrial confidence indicator). Surveys are defined within the Joint Harmonised EU Programme of Business and Consumer Surveys. The economic sentiment indicator is calculated as an index with mean value of 100 and standard deviation of 10 over a fixed standardised sample period, values of the economic sentiment indicator above (below) 100 indicate above-average (below-average) economic sentiment. Currently, mean and variance are fixed over the period 1990-2007.

Figure 1 panel (a) plots the ESI and its subcomponents for the Euro Area aggregate (here descaled to a mean value of 0):

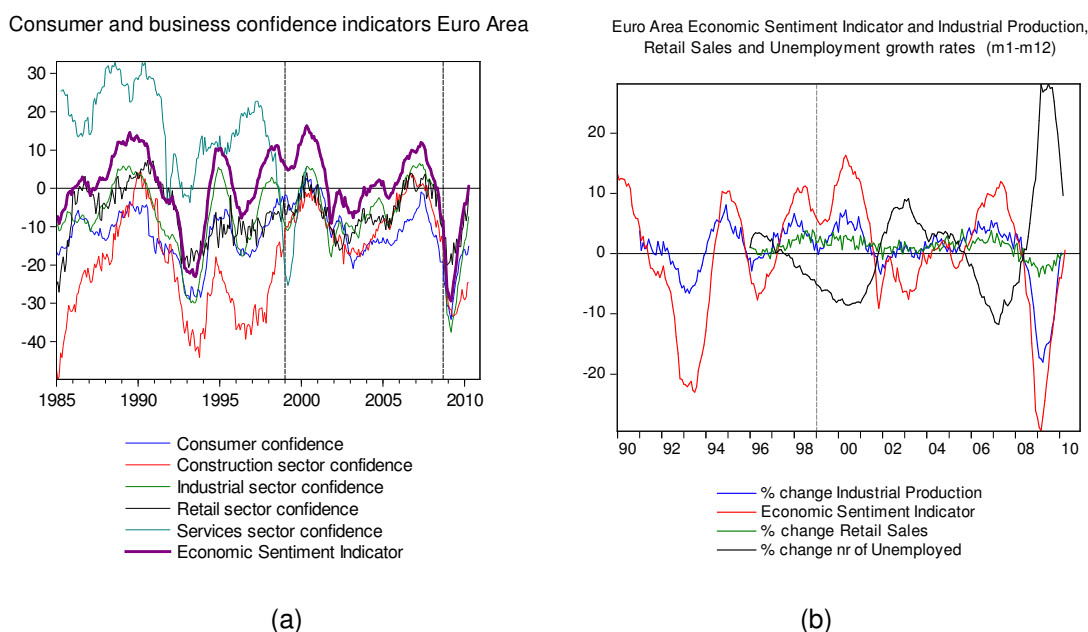


Figure 1
Economic sentiment and business cycle fluctuations in the Euro Area 1990-2010.

Calculations in Table 1 (panel (a)), show that the correlations between the subcomponents are high except for the services confidence indicator:

(a) Contemporaneous correlations

	Consumer confidence	Construction confidence	Industrial confidence	Retail sector confidence	Services sector confidence
Consumer confidence	1.00				
Construction confidence	0.71	1.00			
Industrial confidence	0.86	0.61	1.00		
Retail sector confidence	0.58	0.85	0.57	1.00	
Services sector confidence	-0.14	0.00	0.25	0.29	1.00

(b) Contemporaneous correlations

	% ch. Industrial Production	Economic Sentiment	% ch. Retail Sales	% ch. Unemployment
% ch. Industrial Production	1.00			
Economic Sentiment Indicator	0.90	1.00		
% ch. Retail Sales	0.79	0.79	1.00	
% ch. Unemployment	-0.86	-0.88	-0.74	1.00

Table 1

Correlations between subcomponents of the ESI (panel (a)) and correlations between ESI and business cycle (panel (b))

The industrial production index shows the output and activity of the industry sector. It measures changes in the volume of output on a monthly basis. Data are compiled according to the Statistical classification of economic activities in the European Community, (NACE Rev.2, Eurostat). Industrial production is compiled as a "fixed base year Laspeyres type volume-index". The current base year is 2005 (Index 2005=100). The index is presented in seasonally adjusted form.

The index of deflated turnover for retail trade shows the monthly activity in volume of the retail trade sector. It is a short-term indicator for consumer demand. Data are compiled according to the Statistical classification of economic activities in the European Community, (NACE Rev.2, Eurostat). Deflated turnover for retail trade are compiled as a "fixed base year Laspeyres type volume-index". The current base year is 2005 (Index 2005=100). The index is presented in seasonally adjusted form.

Unemployment plays a key role in macroeconomic transmissions: reflecting labour market adjustment it will reflect the production (the supply side) and consumption (the demand side) decisions in the economy. On its turn we will let sentiment shocks affect the decisions of producers and consumers. Monthly data on the number of unemployed are provided by Eurostat based on harmonised unemployment statistics.

Panel (b) of Figure 1 displays the ESI and the (annual) growth rates of industrial production, retail sales and number of unemployed. The first variable serves as a proxy of consumers' and producers' mindset about the general state of the economy. The last three variables characterise the business cycle from the perspective of production/supply, consumption/demand and the labour market. Clearly visible is the large drop in economic activity and economic sentiment during the recent economic slowdown that followed the financial crisis that spread after the collapse of Lehman Brothers on September 15, 2008. Also a stabilization since the end of 2009 is visible.

Together, these four variables will constitute the endogenous variables in the small VAR model of the Euro Area –viz. small macroeconomic model- that will be used in the next section to analyse the impact of sentiment shocks. By including the sentiment indicator as one of its variables, it becomes to analyse such sentiment shocks and their impact.

The contemporaneous correlations between these variables are found in panel (b) of Table 1. Correlations between the variables are quite large. A positive association appears to exist between economic sentiment and production viz. retail sales, whereas unemployment displays a negative relation with the sentiment indicator. At an intuitive level these correlations are quite straightforward to interpret, e.g. a negative economic sentiment may make consumers and producers reluctant to spend, invest, hire etc. and vice versa an economic slowdown may lead to reduction in economic sentiment. It is important to note that causalities indeed may run in both directions if one recognizes economic sentiment as a real economic variable that plays a distinct role in the economy's productive process, basically according to the ideas

proposed by Keynes. This also explains why in the next section our small model of economic sentiment and the business cycle is based on a VAR model. The VAR approach has the advantage that it does not a priori impose a causal structure on the model variables and instead offers a rich pattern of possible linkages between variables. Inspection of the autocorrelation and cross-correlations suggests patterns of small leads and lags between these variables, which will be picked up by the VAR model given its dynamic structure.

It is important to note that behind the Euro Area aggregate data are the individual data of the Member States. In Figure 2 we display the economic sentiment, industrial production, retail sales and unemployment indicators of the individual countries and the euro area aggregate to illustrate the commonalities and divergences between euro area countries.

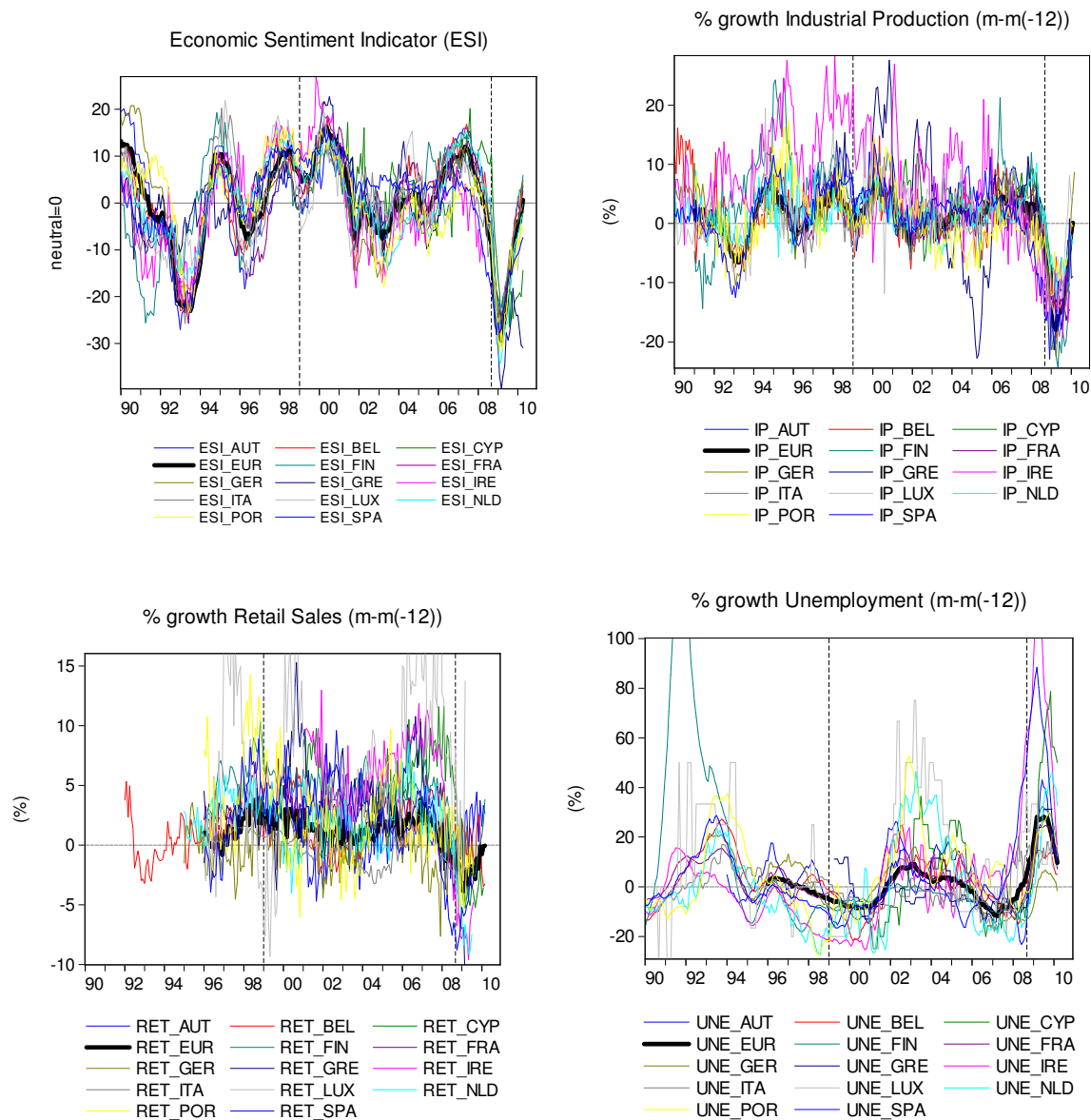


Figure 2
Synchronisation of Economic Sentiment, Industrial Production growth, Retail Sales growth and Unemployment growth in the Euro Area-16

Synchronisation of sentiment in the euro areas is rather high and comparable to the synchronisation of output. Retail sales and unemployment dynamics are also synchronised mostly, however to a somewhat lower degree. The synchronisation of output in the euro area has been studied in a large literature on business cycle synchronisation in the euro area, since business cycle synchronisation is a crucial

prerequisite for a well-functioning monetary union. This literature –see e.g. Gayer (2007)- has indeed established that business cycle synchronisation is high in the euro area if industrial production is used to proxy the output and growth of industrial production to proxy business cycle fluctuations. Synchronisation of economic sentiment may be relevant from a policy perspective: if sentiment shocks indeed can be seen as an independent source of macroeconomic fluctuations in the euro area, it is of quite some relevance to know to which extent economic sentiments and shocks therein are synchronised between countries. It could reflect a rapid diffusion (or contagion) inside the euro area of economic sentiment shocks. The considerable synchronisation in the economic sentiment indicator, also make us confident to focus in the next section on the euro area analysis rather than having to analyse each individual country when analysing economic sentiment shocks and their transmission.²

3. A VAR model of business cycle (sentiment) in the Euro Area

I. Estimation and Identification Strategy

At a macroeconomic level, causality between consumer and producer confidence –such as e.g. measured by the ESI variable introduced above- and macroeconomic variables –here in particular unemployment (UNE), industrial production (IND), and retail sales (RET) may run both ways: increased confidence may boost spending, production and employment, at the same time increased production, employment and incomes may boost confidence. This aspect suggests that a VAR model may be the most appropriate tool if one is interested in studying the interaction between confidence indicators and macroeconomic adjustments. (1) gives this VAR model of the euro area economy that includes economic sentiment as one of its variables.

$$\begin{bmatrix} \%IND_{m-12} \\ \%UNE_{m-12} \\ \%RET_{m-12} \\ ESI \end{bmatrix} = [A] \begin{bmatrix} \%IND_{(m-12)-1} \\ \%UNE_{(m-12)-1} \\ \%RET_{(m-12)-1} \\ ESI_{-1} \end{bmatrix} + \begin{bmatrix} e^{IND} \\ e^{UNE} \\ e^{RET} \\ e^{ESI} \end{bmatrix} \quad (1)$$

Industrial production, unemployment and retail sales are included in the form of annual growth rates (indicated by the % indicator in front of the variables and the m-12 subscript that implies that growth rates are calculated with respect to the same month 1 year ago), economic sentiment in levels since this last variable is already defined as a deviation from its long-run average as explained above. The VAR model, if interpreted as a small scale reduced form macroeconomic model, therefore includes the dynamics of production, consumption –retail sales can be thought of as a broad proxy for consumption-, labour markets and economic sentiment.

Lag length tests suggest that including 3 lags into the specification is appropriate. To transform the reduced form residuals from (1) into a set of orthogonal shocks that can be given a structural interpretation, the Cholesky decomposition is applied.³ We checked if changing the ordering of the variables or using generalized impulse would change the results of impulse response functions and variance decompositions, but this is practically not the case, providing at the same time also some additional confidence about the robustness of these results.

² To be on the safe side we however compared the results for the euro area in the next section with the outcomes of the same model in case of individual euro area countries.

³ The Cholesky decomposition uses the inverse of the Cholesky factor of the residual covariance matrix to orthogonalize the impulses. This option imposes an ordering of the variables in the VAR and attributes the effect of any common component to the variable that comes first in the VAR system.

II. Results: Impulse response functions and variance decompositions

A practical advantage from the VAR specification of our sentiment-business cycle model is that it comes with two very useful analytical instruments: impulse response functions can be used to analyse the impact of different shocks –including sentiment shocks- to explain fluctuations in the endogenous variables. Variance decompositions can be used to determine the relative importance of the different type of shocks in explaining fluctuations of the endogenous variables. Figure 3 provides the impulse response functions that are obtained from the VAR model (1).

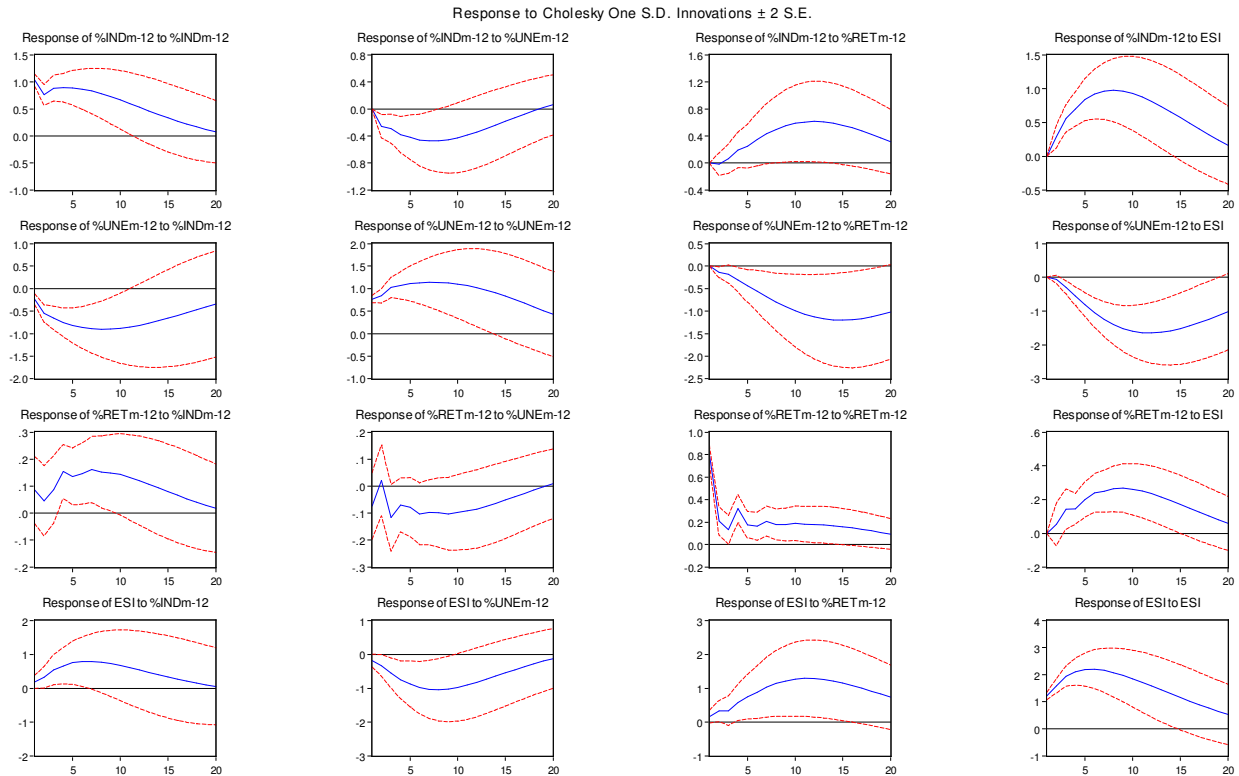


Figure 3
Impulse Response Functions euro area VAR model

The model quite strongly suggest that economic sentiment shocks have economic impacts: the effects on production, consumption and unemployment are significant, prolonged and of the correct sign. At the same time economic shocks also have a significant impact on economic sentiment (last column).

Another very informative instrument tool is the variance decomposition; this instrument can be used e.g. to see how important sentiment shocks are in explaining fluctuations in the business cycle variables and if on its turn the level of economic sentiment is affected by shocks to the business cycle.

Figure 4 provides the variance decomposition that are obtained from the VAR model (1).

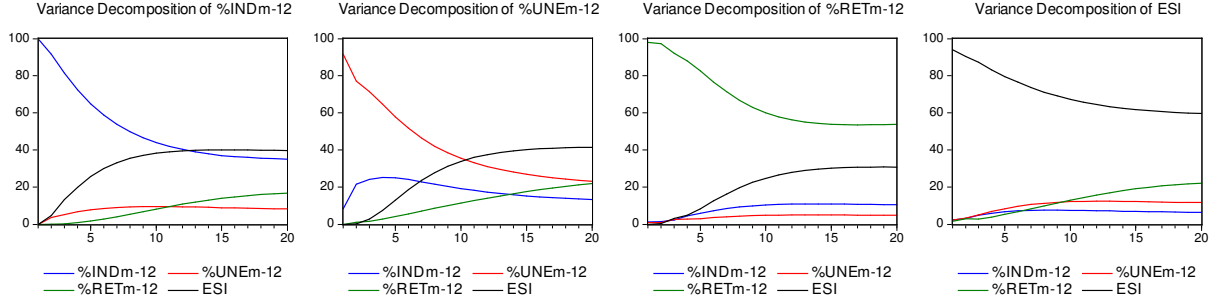
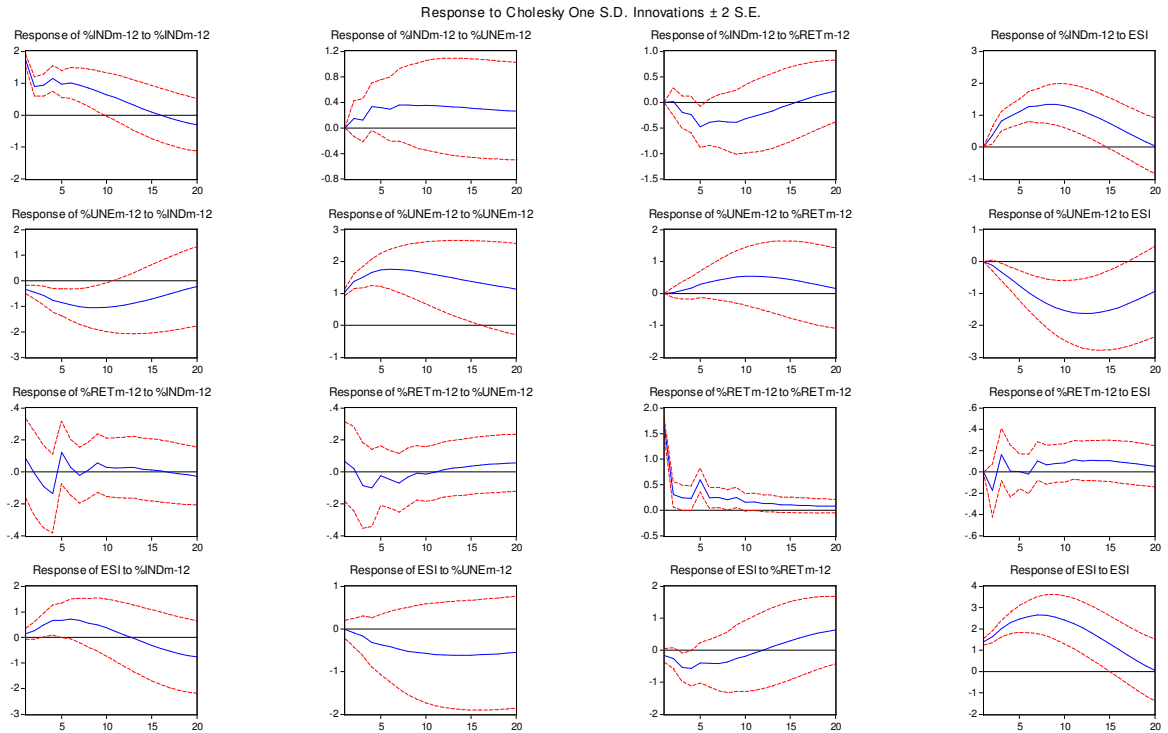


Figure 4
Variance error decomposition euro area VAR model

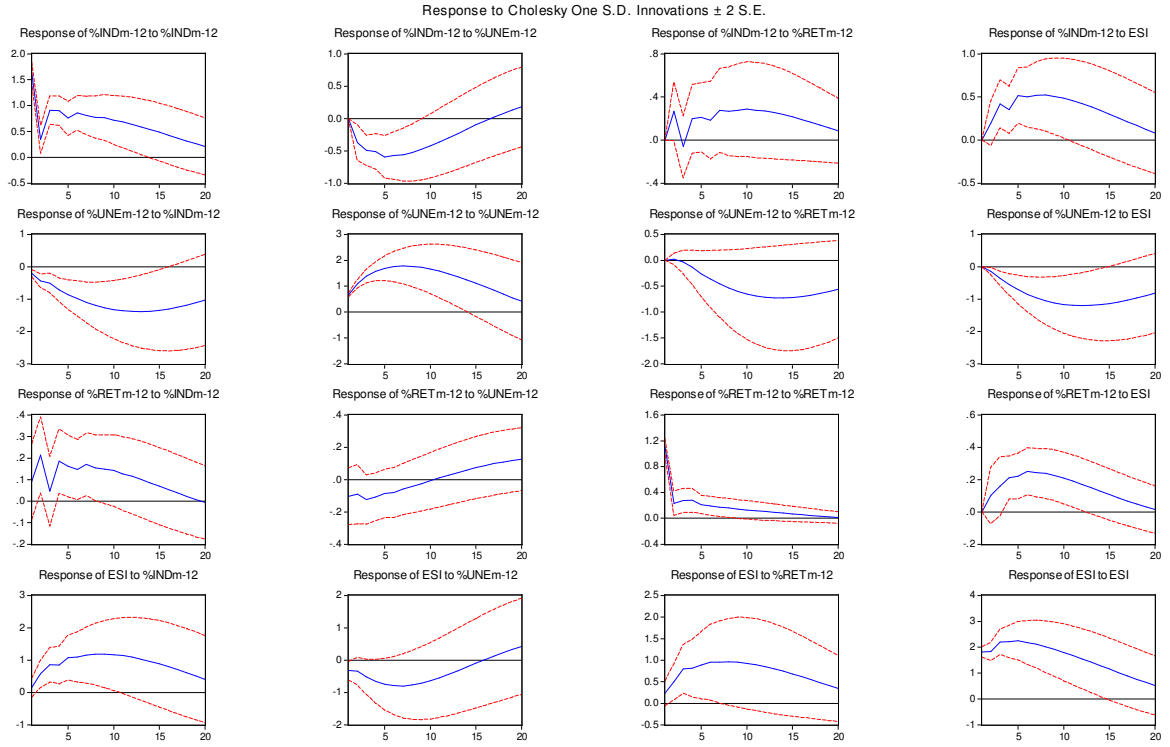
The most important and interesting finding in the decompositions is that our sentiment shocks contribute importantly to the variance in the business cycle variables, in particular in the long run a contribution up to 40% is observed. Business cycle shocks are also explaining about 40% of the observed variation of the economic sentiment indicator.

III Robustness: A comparison with the case of Germany, France and Belgium and the Netherlands and a VAR model with monthly growth rates

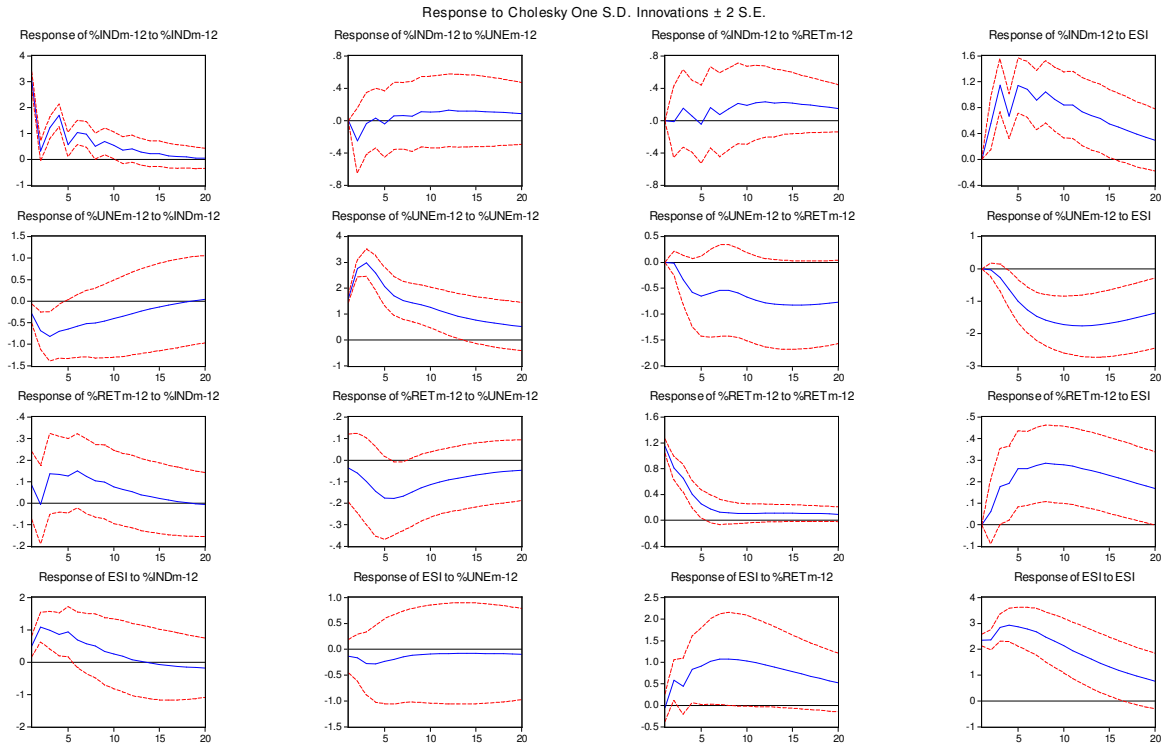
This section assesses the robustness about our findings on the links between economic sentiment and the business cycle. First, we also estimated VAR models for individual euro area countries –using individual country data on industrial production, unemployment, retail sales and economic sentiment from Eurostat- in the same vein as was done for the whole euro area. In Figure 5, the impulse response functions (together with their 99% confidence bounds) for these models are presented for two large euro area countries, France and Germany and two smaller euro area economies, Belgium and the Netherlands. We find that the transmissions of sentiment (and other) shocks displays a quite uniform pattern in these different economies and similar to the transmission in the euro area analysed before. This strengthens also our previous insight that economic sentiment shocks are possibly important in explaining business cycle fluctuations and are transmitted in a relatively similar way across euro area countries.



(a) Impuls respons functions Germany



(b) Impuls respons functions France



(c) Impuls respons functions Belgium

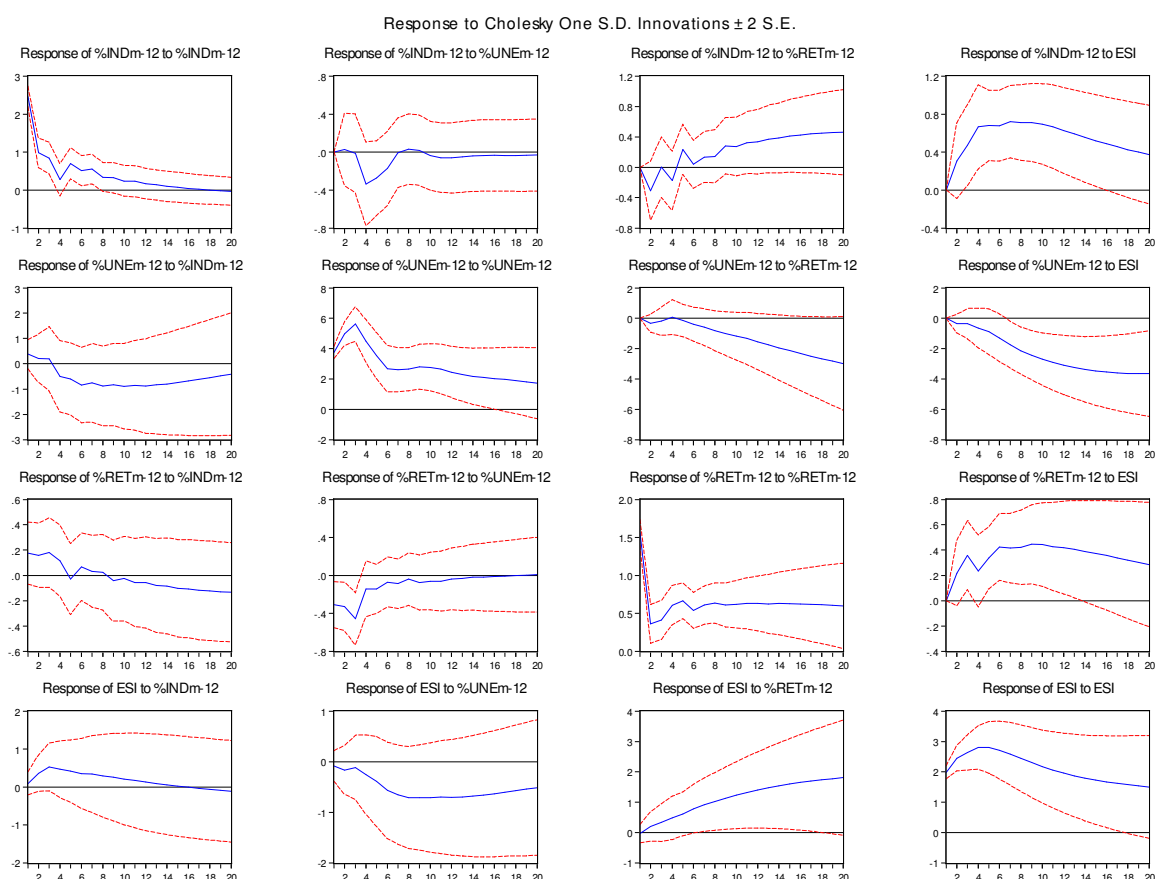


Figure 5
Impulse Response Functions individual euro area countries

Secondly, we also experimented with a similar euro area aggregate VAR model but with monthly growth rates instead of annual growth rates. Monthly growth rates of industrial production, unemployment and retail sales in the euro area are much more volatile than annual growth rates –reflecting e.g. incidental and erratic short-term fluctuations- as Figure 5 illustrates:

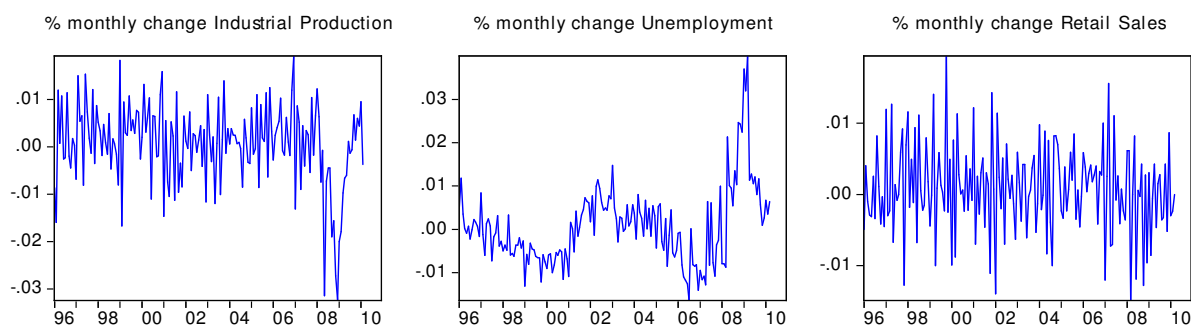


Figure 6
Monthly growth rates euro area Industrial Production, Unemployment and Retail Sales

In this VAR model with monthly growth rates four lags were found to be appropriate. Even if monthly growth rates are much harder to fit, the resulting VAR model broadly confirms our results wrt the effects of sentiment shocks on the economy found before according to Figure 7:

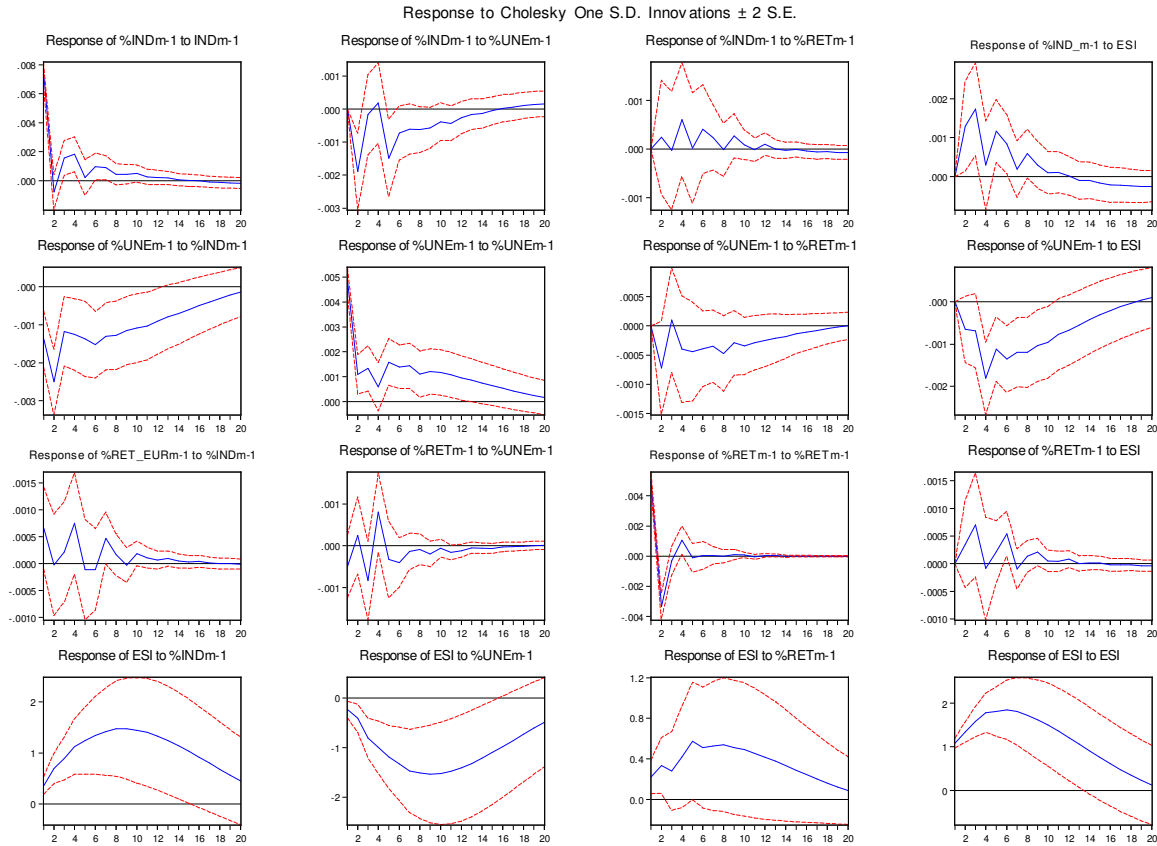


Figure 7
Impulse Response Functions euro area VAR model with monthly growth rates

A positive sentiment shock is followed by an increase in industrial production, a decrease in unemployment and an increase in retail sales. Economic sentiment itself is also driven by positive shocks in industrial production and retail sales and negative shocks in unemployment.

Conclusions

The role of economic sentiment is interesting and also not uncontroversial. The recent financial crisis and ensuing economic slowdown could constitute a case for taking the importance of this variable more serious. Our simple, non-structural VAR model of the Euro Area economy suggests that economic sentiment shocks does have an impact on important macroeconomic variables, here output, retail sales viz. consumption and unemployment. At the same time, we also find significant evidence that economic conditions and shocks on their turn, affect economic sentiment also.

At the policy level, an important insight from our analysis could be that the potential role of economic sentiment should not be underestimated. To the extent that they are under control of policymakers, actions that foster economic sentiment can therefore have an important positive effect on macroeconomic conditions. Or in other words, actions that ruin economic sentiment will transmit themselves inevitably also into the broader economy.

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Appendix: VAR model of the Euro Area

Vector Autoregression Estimates

Sample (adjusted): 1996M04 2010M02

Included observations: 167 after adjustments

	@PCHY(IND_EUR)	@PCHY(UNE_EUR)/100	@PCHY(RET_EUR)	ESI_EUR-100
@PCHY(IND_EUR(-1))	0.631264 [7.61639]	-0.002734 [-4.27616]	0.028737 [0.44691]	4.062214 [0.40632]
@PCHY(IND_EUR(-2))	0.222149 [2.36346]	0.001793 [2.47302]	0.015753 [0.21603]	4.773155 [0.42100]
@PCHY(IND_EUR(-3))	0.027989 [0.32832]	0.000774 [1.17611]	0.010291 [0.15559]	-13.75359 [-1.33751]
@PCHY(UNE_EUR(-1))/100	-28.59293 [-2.62980]	1.066071 [12.7094]	6.237059 [0.73940]	-1056.555 [-0.80561]
@PCHY(UNE_EUR(-2))/100	24.26584 [1.56822]	0.047333 [0.39651]	-18.00232 [-1.49960]	-673.5141 [-0.36085]
@PCHY(UNE_EUR(-3))/100	6.021461 [0.62081]	-0.198207 [-2.64883]	14.12601 [1.87722]	1347.121 [1.15142]
@PCHY(RET_EUR(-1))	-0.068222 [-0.67521]	-0.001620 [-2.07815]	0.253598 [3.23512]	15.18809 [1.24618]
@PCHY(RET_EUR(-2))	-0.033176 [-0.31932]	0.000243 [0.30313]	0.081562 [1.01185]	-14.24880 [-1.13695]
@PCHY(RET_EUR(-3))	0.135011 [1.33581]	-0.000565 [-0.72502]	0.293591 [3.74415]	24.94350 [2.04598]
ESI_EUR(-1)-100	0.002385 [3.55687]	-5.27E-06 [-1.01865]	0.000434 [0.83440]	1.303451 [16.1187]
ESI_EUR(-2)-100	-0.000116 [-0.10572]	-4.68E-06 [-0.55183]	0.000468 [0.54808]	-0.118044 [-0.88982]
ESI_EUR(-3)-100	-0.001841 [-2.53861]	5.01E-06 [0.89497]	-0.000556 [-0.98733]	-0.269649 [-3.08210]
C	0.000305 [0.18355]	3.68E-05 [2.86584]	0.003249 [2.51810]	-0.112745 [-0.56206]
R-squared	0.958667	0.992395	0.734907	0.982972
Adj. R-squared	0.955446	0.991802	0.714250	0.981645
Sum sq. resids	0.016612	9.89E-07	0.009999	241.6996
S.E. equation	0.010386	8.01E-05	0.008058	1.252788
F-statistic	297.6506	1674.587	35.57729	740.8092
Log likelihood	532.5436	1344.934	574.9327	-267.8328
Akaike AIC	-6.222079	-15.95131	-6.729733	3.363267
Schwarz SC	-5.979361	-15.70859	-6.487015	3.605986
Mean dependent	0.007020	8.03E-05	0.011085	1.023952
S.D. dependent	0.049204	0.000885	0.015074	9.246916
Log likelihood		2198.711		
Akaike information criterion		-25.70911		
Schwarz criterion		-24.73824		