

III. Confidence spillovers in the euro area

In recent years, there has been close co-movement between consumer confidence and private consumption in the euro area. During the crisis, in particular, consumer confidence was identified by many commentators as a driving factor in its persistence as expectations about a sustainable path of economic growth were adjusted significantly. In view of the unprecedented extent of the crisis, the question of whether and to what extent changes in consumer confidence in one country could spill over to other countries was also raised. This section discusses the relationship between consumer confidence and consumption, and reviews the evidence of consumer confidence spillovers between euro area countries. We conclude that there is some evidence to suggest that confidence shocks are transmitted between countries. This conclusion is corroborated by results from the estimation of a Global Vector Autoregressive (GVAR) model for a number of euro area countries. ⁽⁶⁶⁾

III.1. Introduction

During the recent crisis, euro area private consumption fell substantially. This was accompanied by a sharp decline in consumer confidence, which many observers have identified as a key factor contributing to the persistence of the slowdown. In fact, the onset of the crisis coincided with an abrupt unwinding of imbalances, that is, of economic trends that turned out to be unsustainable and which led to a significant adjustment of expectations. Both consumption growth rates and confidence levels have been improving since the start of 2013.

There is some (mixed) evidence to suggest that fluctuations in consumer confidence affect the dynamics of private consumption. ⁽⁶⁷⁾ On the basis of this assumption, and taking into account the unprecedented extent of the most recent crisis, it is important to determine whether and to what extent confidence shocks spill over between countries. This is particularly relevant in relation to the euro area where close trade and financial links and common institutional features can lead to the rapid propagation of shocks. In addition, confidence spillovers can be an important aspect to consider when discussing how to improve macroeconomic policymaking in a common currency area.

This section reviews the evidence on the link between consumer confidence and private consumption and on cross-border confidence spillovers, and presents some analysis of the transmission of confidence shocks across the euro area. It is a follow-up to analysis discussed in

previous issues of the Quarterly Report on the Euro Area (QREA). ⁽⁶⁸⁾

III.2. Recent trends in consumer confidence and private consumption in the euro area

Graph III.1 shows the evolution over the period 1995Q2-2016Q1 of euro area real private consumption and consumer confidence. The latter is measured by the Consumer Confidence Indicator constructed by the European Commission as part of the Joint Harmonised EU Programme of Business and Consumer Surveys (BCS). ⁽⁶⁹⁾

There is close co-movement between the two variables. Both real consumption growth and consumer confidence showed the greatest deterioration in the first quarter of 2009 and during the sovereign debt crisis. They have been on a recovery path since early 2013, with consumer confidence reaching levels above the euro area long-term average since the first quarter of 2014.

The relationship between consumer confidence and private consumption is much debated in the literature. From a theoretical perspective, there are two main competing theories. One view is that confidence indicators can help predict the dynamics of consumption as they convey information about future economic conditions. Another theory is that the link between the two variables can be interpreted in terms of ‘animal

⁽⁶⁶⁾ This section was prepared by Francesca D’Auria.

⁽⁶⁷⁾ See, for a discussion, Ludvigson, S.C., 2004, ‘Consumer confidence and consumer spending’, *Journal of Economic Perspectives*, Vol. 18(2), pp. 29-50.

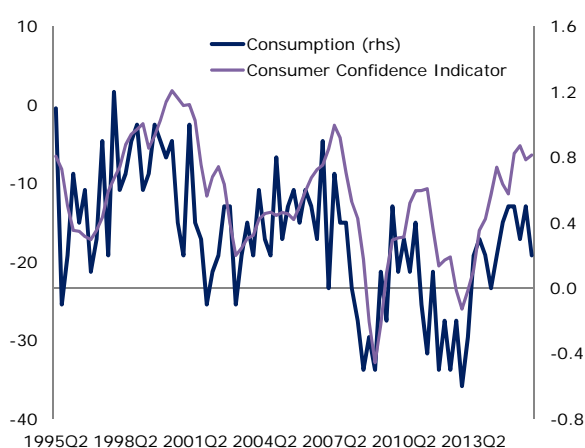
⁽⁶⁸⁾ D’Auria, F., ‘Cross-border spillovers in confidence’, *Quarterly Report on the Euro Area*, (2013), Vol. 12(3), pp.26-30.

D’Auria, F., S. Linden, D. Monteiro, J. in ‘t Veld and S. Zeugner ‘Cross-border spillovers in the euro area’, *Quarterly Report on the Euro Area*, (2014), Vol. 13(4), pp.7-22.

⁽⁶⁹⁾ See European Commission (2016), ‘A user guide to the Joint Harmonised EU Programme of Business and Consumer Surveys’ for details on the construction of the indicators.

spirits’, as confidence indicators capture fluctuations in beliefs which in turn affect consumption.⁽⁷⁰⁾ In both cases, the essence of confidence indicators is to gauge expectations – irrespective of how they are formed – about the future course of the economy, which then have a knock-on effect on current consumer behaviour.

Graph III.1: Confidence and private consumption, euro area (1995Q2-2016Q1, q-o-q % change)



Source: Eurostat and DG ECFIN calculations based on EU Business and Consumer Surveys.

Several studies test empirically the link between consumer confidence and private consumption. A number of them find evidence in support of a strong correlation between consumer confidence and consumption.⁽⁷¹⁾

However, as confidence and consumption are, to a large extent, determined by the same factors, other studies try to assess whether confidence indicators carry information beyond economic fundamentals. The evidence on this issue is mixed, although several studies conclude that confidence indicators play a significant role. There is some evidence to suggest that, while part of the information conveyed by confidence indicators is also captured by other variables (e.g. past consumption, income and interest rates), confidence measures have an additional predictive power for the future path of

consumer spending.⁽⁷²⁾ Moreover, some papers find that confidence indicators have a stronger predictive power during periods of large economic fluctuations.⁽⁷³⁾

III.3. The existing evidence on confidence spillovers

On the assumption that a causal relationship between consumer confidence and private consumption exists, it is important to determine whether and to what extent changes in consumer confidence in one country affect confidence (and thus consumption) in others.

There is some evidence to support the existence of confidence spillovers. This pertains both to confidence shocks originating in the US and being transmitted to the euro area, and shocks which occur in one euro area country and spill over to other euro area countries.

Several studies provide evidence of a transmission channel of confidence shock to foreign confidence. In particular, evidence for G7 countries and Spain would suggest that variations in confidence generally spill over from large countries to smaller ones.⁽⁷⁴⁾ Some studies support the idea that confidence shocks originating in US are transmitted to the euro area, but not the other way round, i.e. shocks to euro area confidence do not affect confidence in the US.⁽⁷⁵⁾ Other studies show a transmission channel for confidence shocks

⁽⁷⁰⁾ See Barsky and Sims (2012) for a discussion of the different theoretical approaches to the role of confidence: Barsky, R. B. and E.R. Sims (2012), ‘Information, animal spirits, and the meaning of innovations in consumer confidence’, *American Economic Review*, 102(4), pp. 1343-1377.

⁽⁷¹⁾ See, for example, Carroll, C., J. Fuhrer and D. Wilcox (1994), ‘Does consumer sentiment forecast household spending? If so, why?’, *American Economic Review*, Vol. 84, pp. 1397-1408.

⁽⁷²⁾ Some authors, e.g. Ludvigson (2004), Souleles (2004) and Lahiri, Monokroussos and Zhao (2016), conclude that including confidence indicators can reduce forecasting errors when predicting the dynamics of consumption, while others reach the opposite conclusion (e.g. Claveria, Pons and Ramos, 2007): Ludvigson, S. (2004), ‘Consumer confidence and consumer spending’, *Journal of Economic Perspectives*, Vol. 18(2), pp. 29-50.

Souleles, N.S. (2004), ‘Expectations, heterogenous forecast errors, and consumption: Micro evidence from the Michigan Consumer Sentiment Surveys’, *Journal of Money, Credit and Banking*, Vol. 36, pp. 39-72.

Lahiri, K., G. Monokroussos and Y. Zhao (2016), ‘Forecasting consumption: the role of consumer confidence in real time with many predictors’, *Journal of Applied Econometrics*, forthcoming.

Claveria, O., E. Pons and R. Ramos (2007), ‘Business and consumer expectations and macroeconomic forecasts’, *International Journal of Forecasting*, Vol. 23, pp.47-69.

⁽⁷³⁾ For example, Howrey, E. (2001), ‘The predictive power of the index of consumer sentiment’, *Brookings Papers on Economic Activity*, Vol. 1, pp. 175-216.

⁽⁷⁴⁾ Fei, S. (2011), ‘The confidence channel for the transmission of shocks’, *Banque de France Working Paper*, No 314.

⁽⁷⁵⁾ Déas, S. and P. Soares-Brinca (2013), ‘Consumer confidence as a predictor of consumption spending: Evidence for the United States and the Euro Area’, *International Economics*, Vol. 134, pp. 1-14.

Box III.1: A GVAR model to assess confidence spillovers

The Global Vector Autoregressive (GVAR) methodology, developed by Pesaran, Schuermann and Weiner (2004) ⁽¹⁾, combines individual vector error-correcting models where domestic variables are linked to country-specific foreign variables. The latter combine the domestic variables using international trade, financial or other relevant weights for each country. This approach allows the analysis of interdependence across different economies, providing a solution to the ‘curse of dimensionality’ (e.g. the high number of parameters as the dimension of the model increases) in global modelling.

For a set of countries $i=0, 1, 2, \dots, N$, the individual VARX(p_i, q_i) models take the following form:

$$x_{it} = \Phi_{i1}x_{i,t-1} + \dots + \Phi_{ip_i}x_{i,t-p_i} + \Lambda_{i0}x_{it}^* + \Lambda_{i1}x_{i,t-1}^* + \dots + \Lambda_{iq_i}x_{i,t-q_i}^* + u_{it}$$

where x_{it} is a vector of $k_i \times 1$ vector of domestic variables, x_{it}^* a $k_i^* \times 1$ vector of foreign variables and:

$$x_{it}^* = \sum_{j=0}^N \omega_{ij}x_{jt}, \omega_{ii} = 0$$

where $\omega_{ij}, j=0,1,\dots,N$ is a set of weights such that $\sum_{j=0}^N \omega_{ij} = 1$. The foreign variables x_{it}^* are therefore a weighted average of domestic variables for all countries included in the model. The weights can be different in nature but are typically constructed using trade or capital flows data. The GVAR model is then solved for the ‘world’ (i.e. all countries included in the model) as a whole, considering all variables as endogenous to the system.

The GVAR model has been applied to a variety of issues. These include: forecasting (e.g. Pesaran, Schuermann, and Smith, 2009); credit risk (e.g. Pesaran, Schuermann and Treutler, 2007); oil price shocks (e.g. Galesi and Lombardi, 2009); global imbalances (e.g. Bussière, Chudik, and Sestieri, 2012); business cycle synchronisation (e.g. Dreger and Zhang, 2013); the impact of EU membership (e.g. Pesaran, Smith, and Smith, 2007); the international effects of fiscal policy shocks (e.g. Favero, Giavazzi, and Perego, 2011). ⁽²⁾ Chudik and Pesaran (2014) provide a detailed review of these and other recent applications. ⁽³⁾

In this section, this approach is used to analyse the transmission of country-specific and global consumer confidence shocks in a model which includes eight euro area countries (Austria, Belgium, Finland, France, Germany, Italy, the Netherlands and Spain) using quarterly data over the period 1996Q2-2013Q1. The model is solved using the GVAR Toolbox developed by Smith and Galesi (2014). ⁽⁴⁾

⁽¹⁾ Pesaran, M.H., Schuermann, T., and Weiner, S. M., (2004), ‘Modelling regional interdependencies using a global error-correcting model’, *Journal of Business and Economic Statistics*, Vol. 22, pp. 129-162.

⁽²⁾ Pesaran, M. H., Schuermann, T., and Smith, L.V., (2009), ‘Forecasting economic and financial variables with global VARs’, *International Journal of Forecasting*, Vol. 25(4), pp. 642-675. Pesaran, M.H., Schuermann, T. and Treutler, B.-J. (2007), ‘Global business cycles and credit risk’, in *The Risks of Financial Institutions*, NBER Chapters, pp. 419-474. Bussière, M., Chudik, A. and Sestieri, G. (2012), ‘Modelling global trade flows: results from a GVAR model’, *Globalization and Monetary Policy Institute Working Paper 119*, Federal Reserve Bank of Dallas. Dreger, C. and Zhang, Y. (2013), ‘Does the economic integration of China affect growth and inflation in industrial countries?’, *FIW Working Paper series 116*, FIW. Pesaran, M. H., Smith, L. V. and Smith, R. P., (2007), ‘What if the UK or Sweden had joined the euro in 1999? An empirical evaluation using a Global VAR’, *International Journal of Finance and Economics*, Vol. 12(1), pp. 55-87. Favero, C., Giavazzi, F. and Perego, F., (2011), ‘Country heterogeneity and the international evidence on the effects of fiscal policy’, *IMF Economic Review* 59(4), 652-682.

⁽³⁾ Chudik A. and Pesaran, M.H., (2014), ‘Theory and Practice of GVAR Modeling’, *Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute, Working Paper No. 180*.

⁽⁴⁾ Smith, L.V. and Galesi, A. (2014). GVAR Toolbox 2.0, available at <https://sites.google.com/site/gvarmodelling/gvar-toolbox>.

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Box (continued)

by the European Commission. Consumption and GDP enter the model in log differences, while the other variables are in levels. Some of the results are discussed in the main text.

between the US, the euro area as a whole and four EU countries taken individually. ⁽⁷⁶⁾

In addition, the role of consumer confidence spillovers in the euro area was assessed in a previous issue of the QREA. ⁽⁷⁷⁾ Consumption and confidence regressions were carried out for a panel of euro area countries over the period 1999-2012. The findings support the existence of confidence spillovers between euro area countries.

III.4. Confidence spillovers across the euro area

Table III.1 shows simple correlations between the confidence indicators of eight euro area countries over the period 1995Q4-2016Q1. ⁽⁷⁸⁾ The strength of the link between consumer confidence indicators across Member States is variable, and, in most cases, is larger between neighbouring countries and between countries sharing similar macroeconomic environments. ⁽⁷⁹⁾

Table III.1: **Consumer Confidence Indicator — Correlation Matrix**
(1995Q4-2016Q1)

	AT	BE	FI	FR	IT	DE	NL	ES
AT	1.00	0.69	0.69	0.74	0.13 ⁽¹⁾	0.54	0.43	0.22
BE	0.69	1.00	0.67	0.88	0.55	0.57	0.68	0.66
FI	0.69	0.67	1.00	0.68	0.39	0.28	0.75	0.55
FR	0.74	0.88	0.68	1.00	0.46	0.55	0.66	0.60
IT	0.13 ⁽¹⁾	0.55	0.39	0.46	1.00	0.04 ⁽¹⁾	0.63	0.81
DE	0.54	0.57	0.28	0.55	0.04 ⁽¹⁾	1.00	0.33	0.23
NL	0.43	0.68	0.75	0.66	0.63	0.33	1.00	0.73
ES	0.22	0.66	0.55	0.60	0.81	0.23	0.73	1.00

(1) Not statistically significant at conventional levels.

Source: DG ECFIN calculations based on EU Business and Consumer Surveys.

⁽⁷⁶⁾ Dées, S. and J. Guntner (2014), 'The international dimension of confidence shock', *ECB Working Paper*, No 1669.

⁽⁷⁷⁾ Op. cit. D'Auria, F. (2013).

⁽⁷⁸⁾ The very low and non-statistically significant correlation of the Italian confidence indicator with the confidence indicators of a number of other euro area countries is somewhat puzzling and there is a need for further investigation into the reasons behind it.

⁽⁷⁹⁾ The strong correlation between confidence indicators in countries sharing similar economic conditions can be indicative of larger confidence spillovers between them, but can also be a reflection of the strong correlation between their economic fundamentals.

The strength of the correlation also varies considerably over time. Table III.2 displays correlations between consumer confidence indicators in the same euro area countries over the period 2008Q1-2012Q4. During the crisis period, the link between consumer confidence indicators is significantly tighter.

Table III.2: **Consumer Confidence Indicator — Correlation Matrix**
(2008Q1-2012Q4)

	AT	BE	FI	FR	IT	DE	NL	ES
AT	1.00	0.93	0.90	0.88	0.36 ⁽¹⁾	0.79	0.86	0.63
BE	0.93	1.00	0.81	0.80	0.34 ⁽¹⁾	0.80	0.81	0.71
FI	0.90	0.81	1.00	0.83	0.58	0.52	0.81	0.66
FR	0.88	0.80	0.83	1.00	0.30 ⁽¹⁾	0.66	0.74	0.61
IT	0.36 ⁽¹⁾	0.34 ⁽¹⁾	0.58	0.30 ⁽¹⁾	1.00	-0.16 ⁽¹⁾	0.65	0.38
DE	0.79	0.80	0.52	0.66	-0.16 ⁽¹⁾	1.00	0.50	0.48
NL	0.86	0.81	0.81	0.74	0.65	0.5	1.00	0.50
ES	0.63	0.71	0.66	0.61	0.38	0.48	0.50	1.00

(1) Not statistically significant at conventional levels.

Source: DG ECFIN calculations based on EU Business and Consumer Surveys.

The presence of a correlation between confidence indicators may point to the existence of confidence spillover effects between countries, but also be indicative of strong business cycle synchronisation. To shed light on the nature of these correlations, this section discusses confidence spillovers in the euro area on the basis of the findings from the estimation of a Global Vector Autoregressive (GVAR) model which includes data for eight euro area countries over the period 1996Q2-2013Q1. Box III.1 describes the model in more detail.

The model includes observations on consumption, GDP, the unemployment rate, a short-term interest rate and consumer confidence. The latter is measured by the BCS Consumer Confidence Indicator, which is an arithmetic average of the balances of the answers to questions on the financial situation of households, the general economic situation, unemployment expectations and savings over the next 12 months. It is therefore taken as a proxy for consumers' expectations about their future economic situation.

The results seem to support the existence of consumer confidence spillovers across the euro area. As an illustration, Graph III.2 reports impulse

response functions of consumer confidence in the euro area countries included in the GVAR model to a positive shock to consumer confidence in Germany over 24 quarters. ⁽⁸⁰⁾

The largest effect appears to be in smaller neighbouring countries (Austria, Belgium and the Netherlands). The response of consumer confidence is also relatively large in Finland, France and Spain. On the other hand, spillovers to consumer confidence in Italy are very small and become negative after six quarters. This is not a surprise given the statistically insignificant correlation between German and Italian consumer confidence emerging from the data reported in Table III.1. The peak response occurs in the second or third quarter.

Similar results, although of a smaller magnitude, were obtained for the other euro area countries included in the model. Confidence spillovers appear to be larger across countries with stronger geographical and trade links. Overall, the evidence from the estimation of the model supports the existence of a transmission channel for consumer confidence shocks across the euro area. However, the effects of confidence shocks on foreign consumption are, in most cases, not statistically significant, suggesting that the transmission channel is to foreign confidence rather than

directly to foreign economic activity. ⁽⁸¹⁾

These results suggest that confidence shocks play a role in the international business cycle and that there are close interlinkages between confidence indicators across euro area countries. This evidence supports the need for coordinated policy action able to boost confidence across euro area countries.

III.5. Conclusions

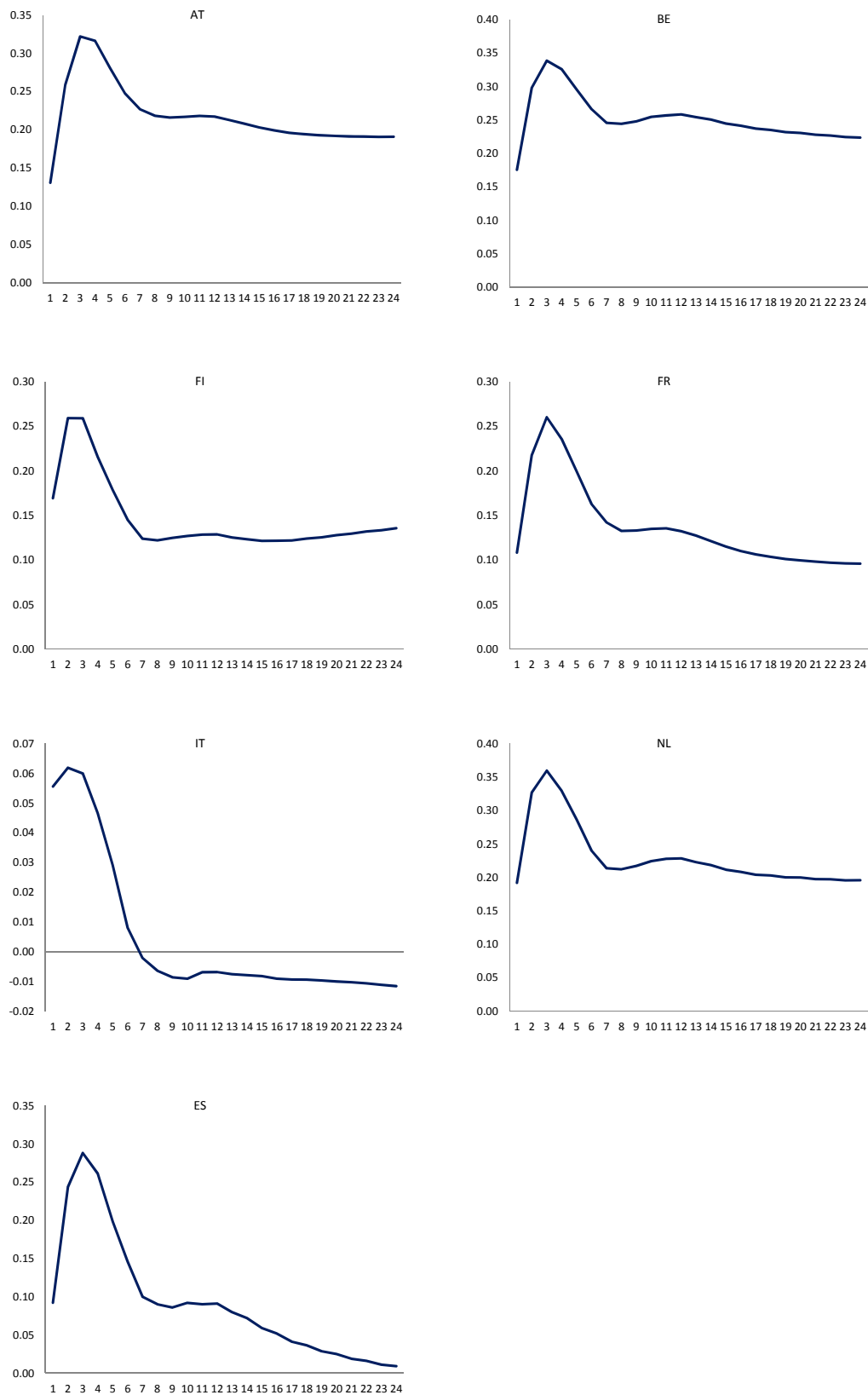
In recent years, the dynamics of euro area consumer confidence and real private consumption have been very closely related. Moreover, consumer confidence indicators across the euro area appear to be strongly correlated. The strength of the correlation was considerably greater during the crisis period.

The evidence of a link between real consumption and consumer confidence is mixed, but several studies are supportive of consumer confidence playing a role in determining consumption. In addition, there is evidence to suggest that shocks to consumer confidence in euro area countries affect confidence in other euro area Member States. This is also borne out by results obtained from the estimation of a Global Vector Autoregressive (GVAR) model for eight euro area countries.

⁽⁸⁰⁾ A caveat must be made about the difficulty of identifying truly exogenous confidence shocks, owing to the fact that confidence indicators are largely driven by the same factors which determine consumption.

⁽⁸¹⁾ Similar conclusions are reached by op. cit. Décs and Soares-Brinca (2013) and Décs and Guntner (2014).

Graph III.2: Impulse response functions of foreign confidence to a one standard error confidence shock in Germany



Source: DG ECFIN.