

Quarterly Report on the Euro Area

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Highlights in this issue

- Focus: Assessing the impact of uncertainty on consumption and investment
- Focus: The role of FDI in preventing imbalances in the euro area
- Recent capital flow developments in the euro area
- Inventory developments in the euro area since the onset of the crisis

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Marco Buti
Director General

Decisions based on limited or distorted information tend to produce bad outcomes. A lesson from the economic and financial crisis is that even the best of information can be of limited use in situations of pervasive uncertainty. High uncertainty has been both a symptom and a cause of the crisis, especially in episodes such as the post-Lehman's fallout, or at the height of sovereign bond market stress in the euro area. When financial markets are in near-free fall, one's views on the future become an amalgamation of fear and past experience, while concrete information is scarce and less pertinent, given that the range of possible scenarios is blown wide open. This can produce especially damaging results for the real economy, which is why one contribution in this Quarterly Report examines the subject in more detail.

Thankfully, we have avoided excessively turbulent times in the past months. Uncertainty has diminished, most clearly so in financial markets, where liquidity in most market segments has been restored, volatility has receded and risk premia have fallen. Here, the fall in uncertainty relates as much to a somewhat clearer outlook for economic and financial activity, as it does to policy developments now and in the future. Policy uncertainty has clearly been a complicating factor in the euro area crisis, and has at times spooked financial markets in particular. Currency redenomination fears surged when the gaps in the euro area's coordination and assistance framework were at their most glaring. But the highly positive market reaction to the ECB's OMT announcement and to the first steps towards a banking union show that decisive policy action can quell and overcome such these fears. Improvement on that front is visible in a prominent policy uncertainty indicator that has started to decline since mid-2012. Recent "soft" indicators have also shown signs of improvement.

Notwithstanding the recent fall of perceived risks on financial markets, the euro area's recovery continues to be hindered by unusually high uncertainty. Several non-financial indicators of uncertainty remain elevated, including the aforementioned policy indicator but also indicators derived from business and consumer survey data. Recent analysis at DG ECFIN has investigated more closely the relationship between uncertainty and growth. It confirms that the impact on consumption and investment is negative and significant and that it

has increased since the crisis. It also shows that uncertainty induces firms to delay recruitment. When occurring jointly, this can cause a negative growth and confidence spiral. These negative effects call for further policy efforts to make the economic environment more predictable.

We have learned from the crisis that establishing appropriate facilities and contingency procedures for dealing with market tension can remove the proverbial 'room for speculation' by anchoring expectations and cutting tail risks. This is a compelling argument for moving further towards completing EMU's architecture. In particular, completing the banking union is a necessary condition for financial markets to function effectively in the common interest. Important steps in this respect include the ECOFIN's recent advances on a common bank recovery and resolution framework as well as on an operational framework for the future ESM direct recapitalisation instrument.

Growth and employment challenges in the euro area are being addressed in a continuous way at the European level, notably in the context of the European Semester. This has brought together Member States and the Commission for a thorough and careful assessment of national structural challenges and budgetary situations, culminating in sets of country-specific recommendations (CSRs) for all Member States plus the euro area as a whole. The CSRs provide comprehensive economic policy guidance combining an appropriate fiscal stance with in-depth structural reforms to bolster growth and adjustment. The specific euro area recommendations are addressed to the Eurogroup which must endorse the responsibility for the overall policy stance and to take forward the work on deepening EMU. While effective coordination will necessitate action in a broad range of areas, an important milestone will be the discussion by the Eurogroup of Member States' draft budgetary plans and their interactions in late 2013. This should ensure an earlier and better coordination of Member States' fiscal plans than in the past.

Overall, by charting the way toward sustained medium-term growth, the CSRs should also help reduce uncertainty in a lasting manner and thereby support domestic demand and growth in the short term.

I. Assessing the impact of uncertainty on consumption and investment ⁽¹⁾

Economic theory suggests that uncertainty has a detrimental effect on economic activity by giving agents the incentive to postpone investment, consumption and employment decisions until uncertainty is resolved, and by pushing up the cost of capital through increased risk premia.

To test the impact of uncertainty on activity in the euro area, indicators of uncertainty for industry and consumers are derived from business and consumer surveys (BCS). The indicators measure the divergence of business and consumer expectations about the economy and their finances. The underlying assumption is that the more economic agents disagree in their expectations, the higher the uncertainty in the economy. The impact of uncertainty is then estimated using fully specified investment and consumption models. To benchmark the results of the estimation against alternative measures of uncertainty, the BCS indicators are compared with a widely used indicator of Policy Uncertainty. A key finding of the analysis is that uncertainty has a significant negative impact on both investment and consumption. The effect of uncertainty on economic activity also appears to have increased since the crisis.

The econometric analysis indicates that uncertainty is currently hindering economic activity in the euro area. Although uncertainty in financial markets has abated significantly in recent months on the back of decisive policy interventions, other sources of macroeconomic uncertainty remain high. The policy uncertainty and BCS indicators are still unusually high and have so far shown only limited signs of improvement.

I.1. Introduction

Arguably, a defining feature of the macroeconomic and financial market situation since the start of the crisis in 2008 has been an unprecedented level of uncertainty. In particular, many commentators have argued that the weakness of the recovery after the financial crisis has been partly due to this exceptionally high level of uncertainty. Uncertainty in financial markets has abated in recent months on the back of decisive policy measures, but available indicators suggest that uncertainty remains unusually high in other sectors of the economy.

According to economic theory, a high level of uncertainty can depress economic activity through a number of channels: investment, consumption, employment or risk premia. When investment, consumption or employment decisions are costly to revert (e.g. due to fixed and adjustment costs), high uncertainty gives agents an incentive to postpone or cancel their decisions until uncertainty is resolved and more information is available, thus depressing economic activity. ⁽²⁾ Other channels

through which uncertainty can dampen economic activity include a higher cost of finance and lower asset prices due to increased risk premia, ⁽³⁾ as well as increasing managerial risk aversion. ⁽⁴⁾

The purpose of this focus section is to examine the evolution of macroeconomic uncertainty in recent years, and to estimate its impact on economic activity. To do so, it reviews developments in a range of uncertainty indicators, including two new indicators derived from business and consumer survey data. The impact of uncertainty is then estimated using fully specified investment and consumption equations.

I.2. Measuring uncertainty

In a broad sense, uncertainty can be illustrated as a mean preserving increase in the ‘tails’ of the probability distribution of an event. An increase in uncertainty makes future outcomes more uncertain in the sense that ‘tail events’, or realisations at the

⁽¹⁾ Section prepared by Narcissa Balta, Ismael Valdés Fernández and Eric Ruscher.

⁽²⁾ Bernanke, B. (1983), ‘Irreversibility, uncertainty, and cyclical investment’, *The Quarterly Journal of Economics*, MIT Press, Vol. 98(1), pp. 85-106, February; Dixit, A.K. and R.S. Pindyck (1994), ‘Investment under uncertainty’, *Princeton University Press*, Princeton, N.J.

⁽³⁾ Gilchrist, S., J. Sim and E. Zakrajsek (2010), ‘Uncertainty, financial friction and investment dynamics’, 2010 Meeting Papers 1285, Society for Economic Dynamics.

⁽⁴⁾ Panousi, V. and D. Papanikolaou (2009), ‘Investment, idiosyncratic risk, and ownership’, *MPRA Paper 24239*, University Library of Munich, Germany.

extreme of the distribution, have a higher probability of occurring. ⁽⁵⁾

Uncertainty is difficult to quantify but economic research has come up with several ways of constructing uncertainty measures based on stock market volatility, ⁽⁶⁾ dispersion in forecasts by professional forecasters, ⁽⁷⁾ or the prevalence of terms such as economic uncertainty in the media. ⁽⁸⁾

A widely used uncertainty indicator in the current empirical literature is the one developed by Baker et al, hereafter, the Policy Uncertainty Indicator. For the EU, this is a composite index based on both a news index indicator tracking the number of entries related to ‘economic uncertainty’ in the press, and dispersion in professional forecasts’ about budget deficits and CPI inflation.

In addition to this Policy Uncertainty Indicator, the analysis presented in this focus section is based on two new indicators capturing uncertainty at the level of industry and consumers. The indicators are constructed for all EU Member States using the European Commission Business and Consumer Surveys (BCS). The industry indicator measures divergence in manufacturing firms’ expectations about future production, whereas the consumer indicator measures divergence in the expectations of consumers’ future financial situation (see Box I.1 for more details on the methodology).

The basic idea guiding the construction of the two BCS indicators is that a divergence of economic agents’ expectations about future activity or financial situation should be a sign of higher uncertainty in the economy. The BCS uncertainty indicators represent a different concept from

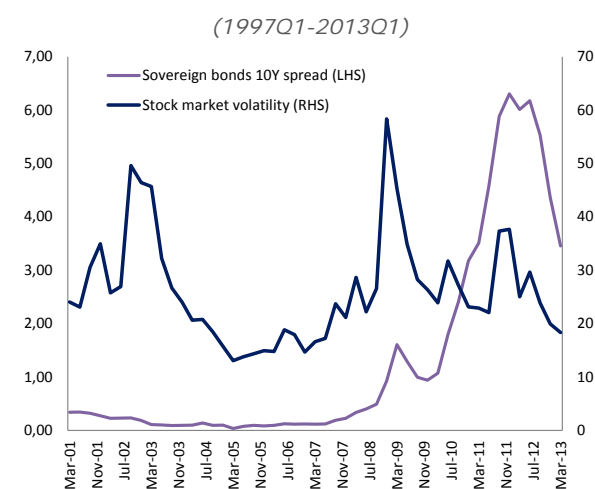
standard economic confidence indicators — which measure average expectations about future economic conditions, but do not convey information on the dispersion of responses.

Although using dispersion measures to track uncertainty is not a new approach, survey-based uncertainty indicators have rarely been used for that purpose. They offer several advantages, including wide data availability (all EU countries) and the fact that uncertainty is measured directly at the level of the agents who make investment and consumption decisions.

I.3. Recent developments in uncertainty at the euro area level

Financial market uncertainty in the euro area has abated in recent months (Graph I.1). Stock market volatility has decreased to almost historically-low levels. Uncertainty in sovereign debt markets has also abated since the end of 2012, although it remains high by historical standards.

Graph I.1: **Financial Market uncertainty has abated in recent months (1) (2)**



(1) Sovereign spreads represent the difference between the average 10-year government bond spreads of Ireland, Italy, Spain, and Portugal v. Germany, in p.p.

(2) Stock Market volatility represents the volatility of the Eurostoxx 50 option traded on Eurex.

Source: Bloomberg, Eurostat.

However, non-financial indicators of uncertainty paint a less encouraging picture (Graph II.2). The BCS indicators reveal that overall uncertainty remains unusually high for both consumers (green line) and industry (purple line). The EU-wide Policy Uncertainty Indicator (blue line) is also at almost record levels, despite having abated somewhat from its peak in mid-2012.

⁽⁵⁾ There is a body of literature which has made a distinction between risk, which is understood to be measurable, and uncertainty, which is not; see ‘Risk and uncertainty in euro area sovereign debt markets and their impact on economic activity’, *Quarterly Report on the Euro Area*, Volume 11 No 4 (2012), DG ECFIN, European Commission. In this section, however, both concepts are used interchangeably.

⁽⁶⁾ Kose, M., and M. Terrone (2012), ‘How does uncertainty affect economic performance?’, *World Economic Outlook*, Box 1.3, pp. 49–53; Bloom, (2007), ‘The impact of uncertainty shocks’, *NBER Working Papers* 13385, National Bureau of Economic Research.

⁽⁷⁾ Bachman, R., S. Esltnr and E. Sims (2010), ‘Uncertainty and economic activity: evidence from business survey data’, *NBER Working Papers* 16143; Baker, S., N. Bloom and S. Davies (2013), ‘Measuring economic policy uncertainty’, *Chicago Booth Research Paper* No. 13-02.

⁽⁸⁾ Baker et al. (2013), op. cit. ; Knotek, E.S. and S. Khan (2011), ‘How do households respond to uncertainty shocks?’, *Economic Review*, Federal Reserve Bank of Kansas City, issue QII.

Box 1.1: Assessing uncertainty with business and consumer survey data

The Joint Harmonised EU Business and Consumer Surveys (BCS) coordinated by the European Commission provide a battery of indicators tracking consumer and business sentiment. This information is usually exploited to perform nowcasts or short-term forecasts of macroeconomic variables such as GDP, industrial production or consumption. This box argues that BCS data can also be used to construct uncertainty indicators. Using surveys to analyse uncertainty is appealing on several grounds:

- The BCS offer relatively long time series (in many cases back to the mid-1980s) available at monthly frequency. They are available for several sectors (e.g. consumers and manufacturers) and cover all EU countries, giving a greater degree of granularity in the analysis than most other uncertainty indicators.
- With survey data, economic uncertainty is measured ‘at source’, i.e. directly at the level of the economic agents who make investment and consumption spending decisions. This contrasts with other measures that capture uncertainty indirectly via financial market indicators, disagreement among professional forecasters or occurrences of certain words in the press.

The general idea guiding the construction of BCS-based uncertainty indicators is that divergence in the expectations of survey respondents can be interpreted as an indication of rising uncertainty. Using divergence in opinions to measure uncertainty is an old idea which has, however, so far been mostly applied to the opinions of professional forecasters. Only a handful of empirical studies have so far used business and consumer surveys in that context (see Bachmann et al (2012) and Fuss and Vermeulen (2004)).

To better capture potential differences in the perception of uncertainty by different economic agents, indicators of uncertainty can be constructed using the BCS consumer and industry surveys. The surveys include a range of questions, only some of which have a clear forward-looking dimension that lend themselves to measuring divergences in expectations. The industry survey only includes one such question:

Question 5: *How do you expect your production to develop over the next 3 months?*

The consumer survey includes several questions on consumers’ expectations about the next 12 months. For the present analysis, two questions are selected covering, respectively, consumers’ expectations about their personal situation and about the general macroeconomic outlook:

Question 2: *How do you expect the financial position of your household to change over the next 12 months?*

Question 4: *How do you expect the general economic situation in this country to develop over the next 12 months?*

Respondents to the industry survey must select one of three possible categories (+ increase, = remain unchanged, – decrease). In the consumer survey, respondents must choose between six categories (+ + get a lot better, + get a little better, = stay the same, – get a little worse, – – get a lot worse, N don’t know).

Standard cyclical survey indicators are calculated as balances between positive and negative responses and therefore ignore the underlying heterogeneity of the responses. To measure this heterogeneity and thereby uncertainty, Theil’s entropy formula can be used as follows:

$$\text{uncertainty indicator for firms} = (1/3) \times \sum_{i=1 \text{ to } 3} \alpha_i \times \text{Log}(\alpha_i)$$

$$\text{uncertainty indicator for consumers} = (1/6) \times \sum_{i=1 \text{ to } 6} \alpha_i \times \text{Log}(\alpha_i)$$

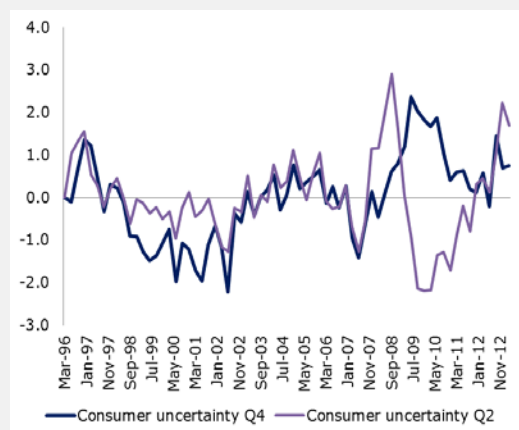
where α_i is the share of respondents choosing each of the categories described above.

The resulting indicators are shown in the two charts below. All indicators have a relatively high degree of cyclicity with uncertainty generally rising during downturns. In particular, all of them show a steep rise in uncertainty with the onset of the global financial crisis, followed by a fall and another rise during the sovereign crisis. However, the timing and magnitude of these recent swings vary depending on the indicator

(Continued on the next page)

Box (continued)

considered. In particular, the consumer measure of uncertainty based on question 2 (as opposed to Q4, the more general macroeconomic question) seems to have been affected earlier than the other indicators by the global financial crisis and more severely by the sovereign crisis. As shown in Box I.3, this indicator is also the one that is the most closely linked to private consumption and produces the most meaningful results in a consumption regression.

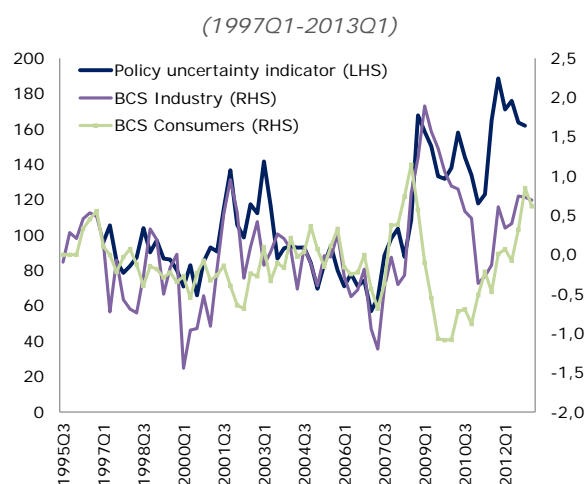


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Bachmann, R., Elstner, S. and E.R. Sims (2010), 'Uncertainty and economic activity: evidence from business survey data', *National Bureau of Economic Research*, Working Paper No. 16143, June.

Fuss, C and P. Vermeulen, (2004), 'Firms' investment decisions in response to demand and price uncertainty', *European Central Bank*, Working Paper Series No. 347, April.

Graph I.2: **Uncertainty is highly counter-cyclical (1)**



(1) LHS: Index of Policy Uncertainty; RHS: Index of uncertainty based on dispersion of BCS responses.

Source: Baker, Bloom and Davies (2013); DG ECFIN calculations based on EU Business and Consumer Surveys.

rising during recessions, and falling during boom times, although in the case of consumers this is less pronounced than for the other two indicators. However, during the last cycle (2008-12), uncertainty has reached exceptionally high levels, and has oscillated sharply.

For the BCS industry and the Policy Uncertainty indicators, uncertainty increased sharply in 2008 to reach unprecedented levels, and it has remained high since then, despite a decrease in 2009-10. Policy uncertainty abated again since the beginning of 2012, which may largely be due to improvements in the governance of the euro. The BCS indicator has shown only very modest improvements since the beginning of 2013. Overall, the correlation between the BCS industry uncertainty indicator and the Policy Uncertainty Indicator is strikingly high (0.7), given that the two measures are based on completely different methods and capture different concepts of uncertainty.

All three measures of uncertainty represented in Graph I.2 are correlated with the business cycle,

By contrast, the BCS consumer uncertainty indicator has followed a somewhat different

evolution throughout this cycle. As the other two indicators did, it increased sharply in the early stages of the recession but then it dropped much more rapidly. It increased again between 2010 and 2012, but more steeply than the other two indicators did. This points to a bigger impact of the sovereign crisis on consumer uncertainty.

I.3.1. Country dimension of uncertainty

Whereas the euro area-wide BCS uncertainty indicators for industry and consumers have clearly followed a crisis-related pattern, their evolution at the country level has shown a high degree of heterogeneity.

For the BCS consumer indicator, there has been a distinct pattern between ‘core’ and ‘peripheral’ countries since as early as 2002 (Graph I.3). Consumer uncertainty increased in the core countries between 2002 and 2006, but it decreased

exceptionally high levels of uncertainty. However, for the core countries, the evolution of uncertainty has been more heterogeneous. For instance, whereas uncertainty in Germany is at a record-low level, France is experiencing a high level of uncertainty by historical standards.

The BCS industry indicator also shows substantial differences by country. However, it is difficult to draw any meaningful pattern from country developments. Regression work also shows that the overall euro area industry uncertainty indicator correlates better with investment fluctuations at the country level than the individual country industry indicators. This suggests that, contrary to the consumer indicator, the country dimension of the industry indicator is probably not very robust and that the analysis of this indicator should be limited to the aggregate euro area level.

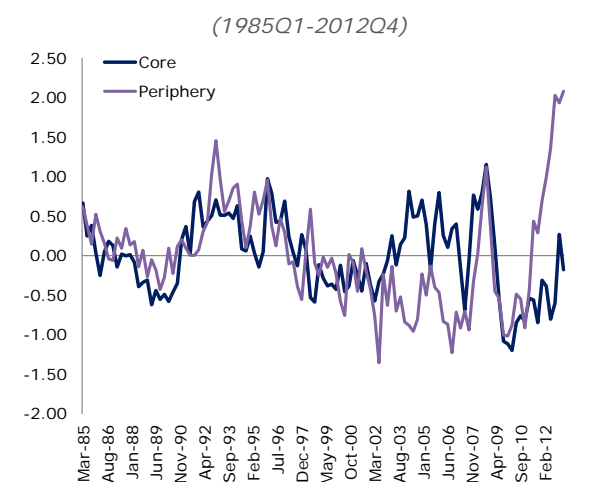
I.4. Estimation of the macroeconomic impact of uncertainty

Some insights from the empirical literature

So far, most empirical research has tried to estimate the impact of uncertainty on investment or GDP based on some of the existing uncertainty measures listed in section I.1 using VAR models. Although existing research has established a negative correlation between uncertainty and investment, there is no real consensus regarding the magnitude of the effect. For instance, Baker, Bloom and Davies (2013) estimate that an increase in uncertainty of the same magnitude as the one experienced between 2006 and 2011 results in a decline of investment of about 14% in levels, and a fall in GDP of about 2.6%. Kose and Terrone (2012) estimate that a one standard deviation increase in uncertainty reduces investment growth by between 0.7 and 2.2 p.p.

By contrast, other authors such as Bachman et al. (2012)⁽⁹⁾ conclude that uncertainty has a limited impact on economic activity. They argue that high uncertainty is a mere epiphenomenon of bad economic times, and that recessions breed uncertainty. A number of other researchers have concluded that the direction of causality runs from uncertainty to the business cycle but, so far, the sense of the causality is not firmly established.

Graph I.3: BCS consumer uncertainty is at record levels in peripheral countries (1) (2)



(1) Core: Ireland, Italy, Spain and Portugal; Periphery: Austria, Belgium, Finland, France, Germany and Netherlands.
(2) Index of uncertainty based on dispersion of BCS responses.

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

in peripheral countries. It increased sharply for both country groups in the very early stages of the crisis, before decreasing again in 2009. Since 2010, uncertainty has been on an increasing trend for both country groups, but whereas uncertainty in the periphery now is at record-high levels, it remains low in the core.

At present, all peripheral countries (Spain, Italy, Portugal, and Ireland) are suffering from

⁽⁹⁾ Bachman et al. (2010), op. cit.

Box 1.2: The impact of uncertainty on productive investment

Based on the neo-classical framework of investment (Jorgenson, 1971), an investment equation is estimated in an error correction framework. The long-term equilibrium is identified as a co-integrating equation that relates productive investment to traditional long-term determinants, such as the cost of capital, to which variables that express the financial position of the corporate sector are added. The short-term dynamic equation links changes in investment to its own lags, lagged changes in GDP, lagged changes in the cost of capital, ⁽¹⁾ lagged changes in the ratio of equity liabilities to total liabilities, lagged deviation of investment from its long-term value (the error correction term) and lagged changes in several economic activity and policy uncertainty indicators. The estimation methodology was originally proposed by Stock and Watson (1993) and extended to a panel context by Kao and Chiang (2000). The analysis includes nine euro-area Member States during the period 1996 q2 - 2011 q4. Cyprus, Estonia, Greece, Ireland, Luxembourg, Malta, Slovenia and Slovakia were not included in the panel due to data availability problems.

Results

In the long term, the volume of productive investment is determined by real GDP, the real cost of capital and a measure of the corporate sector financial position calculated as the ratio of equity liabilities to total liabilities. The latter variable gives an indirect measure of the external financing premium attached to the corporate sector. The higher the ratio, the lower the external financing premium should be. The long-term elasticities are shown in the table below for the period 1996 q2 - 2007 q4, for which investment seems to be explained by its long-term determinants, as estimated in the co-integrating equation. In the long term, a 1% increase in the cost of capital will lead to a decrease in investment of 0.6%, while a 1% decrease in the ratio of equity liabilities to total liabilities will dampen investment by 0.15%. From 2008 q1 to 2011 q4, a structural break in the long-term relationship disconnects investment levels from its long run fundamentals.

	Productive investment	Real GDP	Real cost of capital	Equity liabilities/Total liabilities
Long run elasticities	1	-1,16	0,64	-0,15

Note: The variables are all non-stationary. Group tests for the null of co-interaction were performed. The real cost of capital is calculated as $\log(1 + \text{real cost of capital})$. All variables are in logs. The model was estimated by DOLS. All estimated coefficients are significant at 1%.

Short-term elasticity is illustrated in the table below. Columns (1) and (2) show the estimates for the period 1996 q4 - 2007 q4, for which the long-term investment equilibrium is given by the co-integrating relation. Columns (3) to (5) show the estimates for the period 1996 q4 - 2011 q4, using for the deviations from the long-term equilibrium for the period 2008 q1 - 2011 q4 theoretical model-based estimates of the error correction term (ECT). The ECT is also interacted with a time dummy for periods after 2008 to account for the structural break. Column (4) gives the estimates when both activity uncertainty and policy uncertainty are taken into account. Column (5) gives the estimates when the BCS balance is used to account for the cycle.

Variable	1	2	3	4	5
Error correction term (t-1)	-0.1309***	-0.1548***	-0.1015***	-0.1169***	-0.1011***
2008 Dummy*Error correction term (t-1)			0.0201	0.0313	0.017
Changes in productive investment (t-2)	0.2607***	0.2593***	0.1283***	0.1322***	0.1108**
Changes in real GDP (t-1)	0.6252***	0.4770**	0.9154***	0.8275***	0.8172***
Changes in equity/total liabilities (t-1)	0.1854***	0.1998***	0.1487**	0.1672***	0.1245**
Changes in the BCS industry uncertainty indicator (t-2)	-0.0016	-0.0012	-0.0028***	-0.0027***	-0.0026***
Policy uncertainty based on Stanford indicator (t-1)		-0.0124**		-0.0184***	
BCS balance (Q5) (t-1)					0.0002**
2008 Dummy			-0.0117***	-0.0117***	-0.0114***

*Note: ***, ** and * denote respectively statistical significance at 1, 5 and 10%.*

⁽¹⁾ For details on the construction of the real cost of capital variable, see 'Prospects for non-residential investment in the euro area, Box 8: The real cost of capital', in *Quarterly Report on the Euro Area* (2008), Vol.7, No 4.

(Continued on the next page)

Box (continued)

The estimated parameters in the short-term dynamics bring several interesting results for the period considered:

- For the pre-crisis period, 1996q4 - 2007 q4 (*Column (1) and (2)*), when investment deviates from its long-term determinants, the ECT term brings the system back to the long-term equilibrium from the following quarter (i.e. the estimate on the ECT is significant at 1%). Normal time economic activity uncertainty over the cycle has no impact on the short-term dynamics when investment is determined by fundamentals (i.e. the estimate on the BCS uncertainty indicator in industry is insignificant, *Columns (1) and (2)*). However, policy uncertainty is negatively correlated with investment growth (*Column (2)*).
- During the crisis period, 2008 q1 - 2011 q4 (*Columns (3) to (5)*), investment is no longer given by its long-term determinants, the long-run relationship displaying a structural break. For this period, the long-term determinants of investment do not matter for the short-term investment dynamics (i.e. the estimate on the ECT interacted with the 2008 time dummy is insignificant). However, the impact of the uncertainty indicators increases. The BCS indicator in industry become significant in the short term (*Columns (3) and (5)*), while the impact of policy uncertainty increases (*Column (4)*). During the crisis period, both the economic activity and the policy uncertainty indicator are negatively correlated with investment growth.

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- Stock, J. and M. Watson (1993), 'A simple estimator of co-integrating vectors in higher order integrated systems', *Econometrica*, 61(4), pp. 783-820.

A less-explored channel has been the impact of uncertainty on consumer spending. The theoretical impact of uncertainty on consumer spending is also based on the principle that, when purchases of durable goods such as homes are costly to revert, households respond to increases in uncertainty (e.g. over their future income or taxes) by reducing their consumption of durable goods below their normal levels. However, empirical research by Knotek and Khan concludes that changes in uncertainty account for only a small part of the total fluctuations in household spending.⁽¹⁰⁾ Another channel through which uncertainty can impact consumer expenditure is through employment: Arpaia and Turrini⁽¹¹⁾ find that changes in policy uncertainty make the unemployment rate more responsive to changes in output as employers

become more reluctant to hire when the policy environment becomes more uncertain.

The approach followed in this focus section bypasses some of the shortcomings of using VAR models. A drawback of VAR models is that they may omit important explanatory variables and may therefore overestimate the impact of uncertainty on economic activity.

By using fully-specified consumption and investment equations, the bias due to omitted variables is likely to be reduced significantly. Another advantage of the current approach is that it estimates uncertainty using country-specific measures of uncertainty, allowing to better match country-specific conditions. Finally, most of the empirical work so far has estimated the impact of uncertainty on either investment or consumption in isolation. In this focus section, the impact of uncertainty is estimated for both industry and consumers.

⁽¹⁰⁾ Knotek, E.S. and S. Khan (2011), op. cit.

⁽¹¹⁾ Arpaia, A. and A. Turrini (2013), 'Policy-related uncertainty and the euro-zone labour market', *ECFIN Economic Brief* Issue 24, European Commission.

Box 1.3: The impact of uncertainty on private consumption

This box presents an assessment of the impact of uncertainty on private consumption based on an estimated consumption model. The model is an error correction model composed of a medium-term co-integrating equation and a short-term equation. It is estimated for a panel of eight euro-area countries (DE, EL, ES, FR, IT, AT, PT, FI) over the period 1999 Q1 to 2012 Q4. The choice of the countries and relatively short time sample were dictated by data availability.

The medium-term co-integrating equation relates consumption to its traditional determinants: disposable income, net financial wealth and house prices (all in real terms). To capture the effect of credit constraints on consumption, it also includes the ratio of household credit to house prices. The ratio is assumed to be correlated with banks' loan-to-value ratios, meaning that an increase can be interpreted as an easing of credit constraints, which should have a positive impact on consumption. This is in line with recent research showing that, for the euro area as a whole, households' savings and mortgage demand can be modelled jointly as a system of two co-integrating relationships and that the ratio of mortgage to household wealth is then a meaningful component of the savings co-integrating relationship (Balta and Ruscher (2012)). The medium-term relationship is estimated with dynamic OLS (including a time trend). The results are presented in the table below.

	Real consumption	Real disp income	Real net foreign assets	Real house prices	Ratio of credit to house prices
Coefficient	1	-0.1950***	-0.0436***	-0.2195***	-0.1702***

Note: All variables are in logs. The model was estimated by DOLS. All estimated coefficients are significant at 1%.

The next table shows a number of variants of the short-term equation relating consumption to the same determinants as in the medium-term equation (all in first differences) and the error correction terms from the medium-term equation. The real long-term interest rate is an additional regressor entered in levels as tests indicate that the variable is stationary. The equation allows testing the impact of three measures of uncertainty: two indicators based on consumer survey data and the policy uncertainty indicator constructed by Baker et al. The survey-based indicators are stationary and can therefore be tested in levels. However, the policy uncertainty indicator is not stationary, and therefore enters the equation in first differences.

Variable	1	2	3	4	5
Cointegrating equation residual (-1)	-0.2883***	-0.2878***	-0.2803***	-0.3475***	-0.3195***
$\Delta \log_{\text{net foreign assets}} (-1)$	0.0851***	0.0858***	0.0774***	0.0563***	0.0980***
$\Delta \log_{\text{credit / house prices}} (-1)$	0.1250***	0.1242***	0.1275***	0.0375	0.0568
$\Delta \log_{\text{real house prices}} (-2)$	0.1230***	0.1219***	0.1239***	0.0283	0.0496
Long-term interest rate (-1)	-0.0011***	-0.0011***	-0.0011***	-0.0008**	-0.0009***
Consumer uncertainty Q2 (-2)	-0.0020***	-0.0020***	-0.0019***	-0.0010**	-0.0011**
Consumer uncertainty Q4 (-2)		-0.0001			
$\Delta \text{Stanford indicator} (-1)$			-0.0001**		
BCS balance consumer Q2 (-1)				0.0005***	
Crisis dummy * Cons.uncertainty Q2 (-2)					-0.0026***
Crisis dummy					-0.0047***

Note: ***, ** and * denote respectively statistical significance at 1, 5 and 10%.

Results show that the regression coefficient of the uncertainty indicator based on the Q2 question of the consumer survey (*consumers' expected financial situation*) is meaningful and negative, i.e. consumer uncertainty has a negative impact on consumption (column 1). The uncertainty indicator based on the Q4 question (*consumers' expectations regarding the general economic situation*) is also statistically significant but its impact is less strong and becomes statistically insignificant when estimated jointly with the other consumer indicator (Col 2). Adding the policy uncertainty indicator does not alter significantly the results obtained for the survey based indicator Q2 (column 3). The two uncertainty indicators are negatively and meaningfully correlated with consumption although the survey indicator shows some lead relative to the policy one as the former is lagged by two quarters and the latter by only one quarter. As the policy indicator enters the

(Continued on the next page)

Box (continued)

equation in first differences, it appears to have a less persistent effect than the survey indicator. The survey indicator of uncertainty also remains significant when the simple balances to the corresponding survey question (Q2) come into the equation (column 4). This suggests that the measure of uncertainty derived from the consumer survey adds information to traditional consumer confidence indicators. The same applies when the more general indicator of consumer confidence is used (not shown in the table). Finally, tests with a crisis dummy (set to 1 since 2009) indicate that the effect of uncertainty on consumption may have increased since the crisis (column 5). This suggests that consumers may now be more sensitive to uncertainty, which may reflect negative interactions between uncertainty and credit constraints: increases in uncertainty may be more difficult to cope with when credit constraints are more binding.

Overall, the Q2 survey indicator of uncertainty appears to be better correlated with consumption than the policy indicator, once the long-term determinants of consumption have been taken into account. On the basis of this indicator, uncertainty appears to have a substantial impact on private consumption. In countries such as Spain, Italy, France or Portugal, where uncertainty appears particularly high at the current juncture, a return of uncertainty to its pre-crisis long-term average could boost consumption by 1.5-2.0% over 18 months. The effect could be even stronger (2.0-3.0%) if consumers' apparently stronger sensitivity to uncertainty since the crisis is taken into account.

Reference:

Balta, N. and E. Ruscher (2012), 'Household savings and mortgage decisions: the role of the 'down-payment channel' in the euro area', *European Economy, Economic Papers*, No. 445, September.

I.4.1. Assessing the impact of uncertainty on investment and consumption

The BCS and Policy Uncertainty indicators are tested in fully specified investment and consumption models using panel estimations of Error Correction Models (ECM) — see further explanations in Box I.2 for the investment equation and Box I.3 for the consumer equations.

The investment model has the following medium-term explanatory variables: GDP, the real cost of capital, and a balance sheet variable (equity / total liabilities in the non-financial corporation sector). For the consumption model, the medium-term determinants are disposable income, net financial wealth, house prices, and household credit to house prices (to capture the effect of credit constraints on consumption).

The BCS and the Policy Uncertainty indicators are tested in the short-term dynamics of the consumption and investment equations. The main findings of the exercise are:

Result 1: Uncertainty has a significant effect on both investment and consumption. If uncertainty was to return to its average pre-crisis levels, investment would increase upon impact by 1.4 %. For a similar decrease in uncertainty, consumption would experience a cumulative

increase of by between 2 and 3 % over six quarters in those countries where uncertainty is exceptionally high (i.e. in Spain, France, Italy, and Portugal).

Although the magnitude of the effects are not directly comparable (the consumption and investment equations have different dynamics specification), the results indicate that uncertainty can have a significant effect on consumption too. This is a relatively new finding, given that most research on uncertainty has focused on its impact on investment and has to a large extent neglected the consumption channel. It is worth stressing that there is no reason a-priori to assume that investment should be more affected than consumption. If anything, it could be expected that firms are better at managing uncertainty than consumers, as they have more tools at their disposal to reduce their risk exposure and see through uncertainty (hedging techniques, analytical capacity etc.).

Result 2: The effect of uncertainty on activity goes beyond traditional cyclical effects. To account for variations in the business cycle, the traditional balances of responses to the BCS consumer and industry surveys (i.e. the traditional BCS sentiment indicators) were tested alongside the uncertainty indicators. When confidence indicators are included in the estimations,

uncertainty indicators remain statistically significant, suggesting that uncertainty has an impact on economic activity, even when correcting for the business cycle.

Result 3: The effect of uncertainty has increased since the crisis. Both the BCS industry and the Policy Uncertainty Indicator are statistically significant and negatively correlated with investment, once the determinants of investment are taken into account. However, the effect of uncertainty increases in the post-crisis period. For consumption, both the BCS consumer and the Policy Uncertainty indicators are also statistically significant and negatively correlated with consumption once the determinants of consumption are included. As for industry, the detrimental effect of uncertainty on consumption has increased since the crisis.

Result 4: The BCS consumer indicator appears to be a more robust measure of uncertainty affecting consumption decisions than its industry counterpart is for investment. ⁽¹²⁾

The BCS consumer uncertainty indicator outperforms the Policy Uncertainty Indicator for consumption, but the industry indicator appears less significant for investment than the policy indicator.

There are several reasons that could explain why, by construction, the BCS consumer indicator could be a more robust measure of uncertainty than the BCS industry indicator. First, whereas companies are asked about their production expectations in the next 3 months, households are asked about their financial situation in the next 12 months, and it is likely that a longer time horizon yields a more robust assessment of uncertainty in expectations. Second, responses to survey questions can fall into five categories for consumers against only three for industry. This higher granularity is likely to make the consumer indicator more responsive to changes in economic conditions.

Overall, the econometric analysis shows that uncertainty can have a meaningful effect on both consumption and investment decisions. It is worth stressing, however, that this effect is probably underestimated since some of the effects of

uncertainty are likely to have been captured by other explanatory variables, such as interest rates or consumer wealth through increased risk-premia. Obviously, this analysis ignores possible second-round ‘Keynesian’ effects, as uncertainty may depress investment and thereby economic activity, disposable income and consumption.

1.5. Conclusion

Although financial market uncertainty has abated significantly in recent months, other forms of macroeconomic uncertainty remain high. Measures of policy uncertainty or measures of divergence in consumers’ and firms’ expectations have shown sharp rises since the beginning of the crisis. They remain close to historical highs and have so far shown only limited signs of improvement. Some uncertainty indicators point to particularly high uncertainty in peripheral countries, but also in some other Member States such as France.

The econometric analysis presented in this focus section indicates that uncertainty is hindering economic activity significantly in the euro area, and having a negative effect on both consumption and investment spending.

The impact of uncertainty on economic activity has increased significantly since the financial crisis. Although further research is needed to understand the causes of this change, possible explanations include credit constraints and balance sheet effects as well as non-linear effects of uncertainty on activity.

Overall, the policy measures taken both at the euro area/ EU and the Member State level to improve the governance of EMU, address perceived redenomination risks and reform Member States’ economies have helped to reduce uncertainty on financial markets substantially. However, for businesses and households, uncertainty remains unusually high, which calls for policy action to make the road ahead more predictable.

⁽¹²⁾ Further work needs to be undertaken to understand the reasons behind this discrepancy.

II. The role of FDI in preventing imbalances in the euro area ⁽¹³⁾

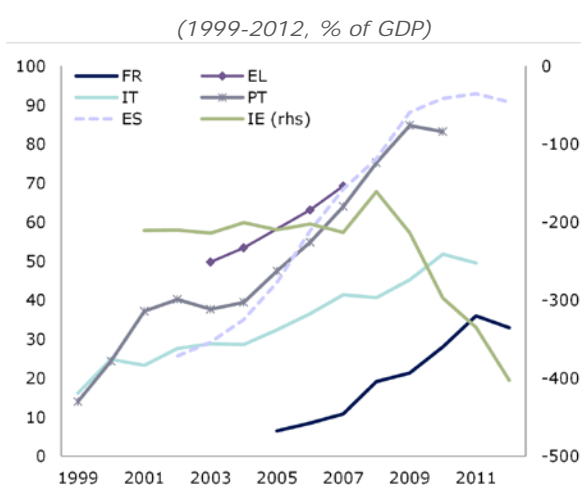
The recent crisis has revealed the unsustainability of large debt-financed negative external positions. Foreign direct investment is a more stable financing option for the current account because in general it is not debt-generating and has positive effects on the productivity of the recipient economy. After reviewing the determinants and mechanisms driving total FDI, this focus section goes on to look at the composition of FDI. Tradable sector FDI has the potential to improve the trade balance by stimulating exports. Policies that can attract FDI in tradable sectors are therefore highly desirable. The empirical analysis identifies wages and education as the two main determinants of this type of FDI in the euro area. The quality of business-relevant infrastructure and distance from important industrial centres are also components that boost the proportion of FDI in the tradable sector.

II.1. Introduction

The ability of countries to attract foreign direct investment (FDI) is affected on the one hand by geographical proximity to important potential source countries, quality of infrastructure (e.g. transport and communication networks and business facilitating infrastructure) and labour skills, and on the other by costs relating to labour and taxes. With EU enlargement, existing Member States gained access to new customers in countries which were geographically closer to the old industrial centre and where costs were considerably lower. These factors may go some way towards explaining why FDI has flowed into some of these new Member States in the pre-crisis decade, whereas for others, in particular those considered vulnerable, but not only, inward FDI has decreased substantially. As well as the volume of FDI, the type of FDI is also of interest. In a process of macroeconomic re-balancing and growth promotion shadowed by external sustainability concerns, non-debt-creating cross-border capital flows increase in importance. The role of FDI, and the degree to which it falls short of potential levels, is therefore an important factor in the growth prospects of a number of euro-area countries, in particular the most vulnerable.

A number of euro-area countries experienced large current-account deficits leading to deteriorating external debt positions prior to the 2007-08 financial crisis. Since then, there has been a substantial correction in these deficits. However, the sustainability of external positions (measured by the net international investment position, or the net external debt, as shown in Graph II.1) remains a pressing issue.

Graph II.1: Net external debt (1)



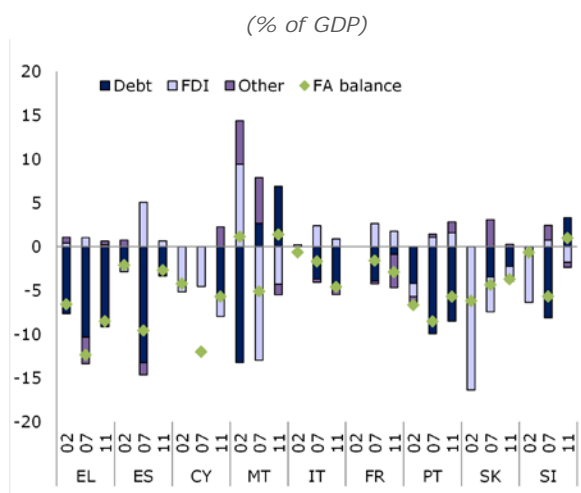
(1) Net external debt is the subset of the net international investment position that excludes equity and financial derivatives; it is calculated as liabilities minus assets.

Source: Eurostat.

Graph II.2 plots the net contributions of debt and FDI in the financing of the current account balance in a number of euro-area countries in 2002, 2007 and 2011 (last available data). The graph shows data for the countries which had persistent deficits in the first decade of the century. A positive/negative number indicates a current-account surplus/deficit position and net FDI or debt outflows/inflows. For some euro-area countries (Greece, Spain, Portugal and Italy), debt has been the biggest component of the external deficit. At the same time, low FDI in these countries was a significant negative factor affecting the sustainability of their external position. For others, e.g. Malta, Slovakia and to a lesser extent Cyprus, FDI also made an important contribution to financing the current-account deficit. FDI also accounted for a large proportion of external financing for non-euro Member States such as Bulgaria, Romania, Latvia and Lithuania.

⁽¹³⁾ Section prepared by Maria Demertzis and Peter Pontuch.

Graph II.2: **Financing the current account (1)**



(1) Debt is defined as other investment plus portfolio investment, debt securities. Columns do not add up to the FA balance if component data are missing.

Source: Eurostat.

As countries in the euro-area periphery are seeking to redress imbalances and reduce their liabilities in a period of low growth prospects, FDI is becoming increasingly important as a potential driver of growth. This is because it is a non-debt-creating liability, but also because it is typically more productive than internal investments, given the types of firm that engage in it.⁽¹⁴⁾ Evidence suggests that a **one percentage point** increase in the ratio of FDI **inflows** to GDP in the EU Member States increases the growth rate by **more than one percentage point** (between **1.2** and **1.5 pps**) in the medium term.⁽¹⁵⁾ This high multiplier is due to the direct effect of FDI on aggregate demand and to its second-order effect on total investment and productivity. At the same time, FDI inflows are not without risk. For example, inflows may be subject to abrupt breaks which, though not representing reverses *per se*, can be very disruptive to productive processes.

⁽¹⁴⁾ Helpman, E. (2006), 'Trade, FDI and the organisation of firms', *Journal of Economic Literature*, Vol. XLIV, September, pp. 589-630.

⁽¹⁵⁾ European Commission (2012), 'FDI flows and EU industrial competitiveness', European Competitiveness Report; 'Reaping the Benefits of Globalisation', Commission Staff Working Document 299.

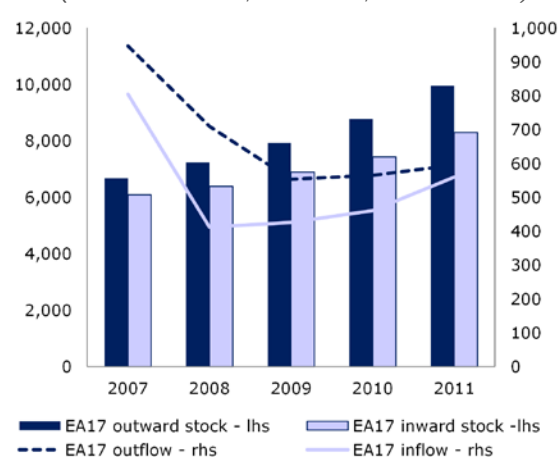
II.2. The role of FDI

FDI in the euro area

Although a major player in global FDI, the euro area (and the EU as a whole— see Graphs II.3 and II.4) has witnessed a significant **decline** in both inward and outward flows since the end of 2007, when the crisis hit. The flows and stocks of outward FDI by the euro area have remained above those of inward FDI.

Graph II.3: **Total outward and inward FDI**

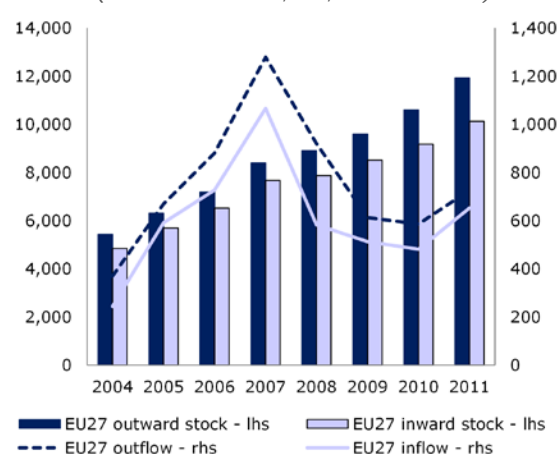
(stocks and flows, euro area, in EUR billion)



Source: Eurostat.

Graph II.4: **Total outward and inward FDI**

(stocks and flows, EU, in EUR billion)

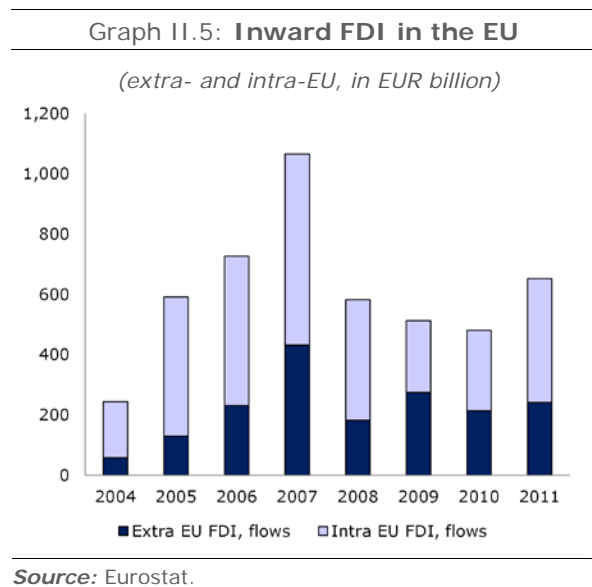


Source: Eurostat.

Graphs II.4 shows that European countries returned to 2005 nominal levels after the peak of

inflows in 2007.⁽¹⁶⁾ This may reflect an adjustment towards new long-term levels after the exceptional enlargement-linked increase in 2005-07. As regards **outflows**, until recently EU capital invested abroad accounted for over half of the global total. Between 2009 and 2010, however, the proportion dropped to a third.⁽¹⁷⁾

The largest share of FDI into EU Member States is from EU firms (intra-EU), and this is also the component that has seen the greatest decline since the end of 2007 (Graph II.5). Since inward flows into the EU are predominantly into euro-area countries (compare Graphs II.3 and II.4), Graph II.5 can also be seen as representative of developments in the euro area.



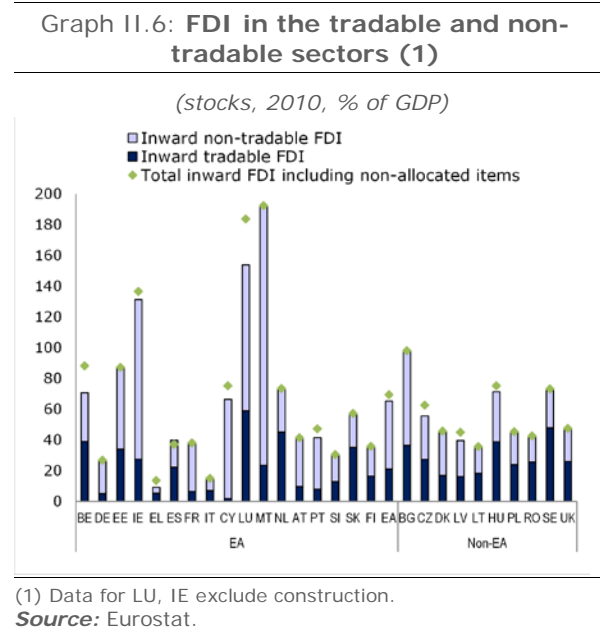
The main recipients of European outward FDI have been the US and the EFTA countries. Since 2007, EU and euro area firms have been less willing to invest inside the area and have sought destinations more resilient to the financial crisis. This comprises **emerging** and **transition** economies, including the 'BRICs', Turkey and Mexico.⁽¹⁸⁾ Foreign firms' (from outside the EU), investments in the EU on the other hand, have not diverged substantially from historical standards.

⁽¹⁶⁾ Data availability problems do not allow showing data before 2007 in the case of the euro area.

⁽¹⁷⁾ European Commission, 2012, see footnote 15.

⁽¹⁸⁾ European Commission, 2012, see footnote 15. (BRICs: Brazil, Russia, India and China).

This focus section goes beyond overall FDI trends to look also at the **sectoral breakdown**. It examines how inward FDI in euro area and other EU countries has evolved differently in the tradable and non-tradable sectors.⁽¹⁹⁾ This is motivated by the different ways that inflows in these sectors may affect the external balance of each economy. On the one hand, export capacity is directly affected by inflows in the tradable sector. On the other hand, inflows in the non-tradable sector have only an indirect positive effect on exports, by increasing competition and lowering prices in sectors that produce input. They may even reduce exporting capacity by diverting resources away from tradables. Although FDI is beneficial in all its forms, shifting inflows from the non-tradable to the tradable sector could allow all benefits to be reaped while maximising the positive effect on the recipient country's external balance. It is thus important to identify the determinants of FDI in the tradable sector in order to adopt policies that promote them.



Graph II.6 plots the tradable and non-tradable components in total FDI stocks as a percentage of GDP in euro-area and other EU economies in 2010. The non-tradables represent the **biggest component** of FDI in most, but not all, euro area

⁽¹⁹⁾ In line with convention, tradables are defined as: agriculture, mining, manufacturing, energy and utilities, trade, transport, accommodation and food services. The non-tradables are defined as information, communication, finance, other services, construction, and real estate.

countries. This is related to the importance of the banking sector in non-traded FDI. However, for a number of Member States, e.g. Belgium, the Netherlands and Slovakia (where many large export-oriented multinationals are based), the stock of FDI in tradable sectors dominates. Outside the euro area, the stock of FDI in tradables also dominates in the Czech Republic, Hungary, Sweden and the UK. ⁽²⁰⁾

FDI appears to have recently (in 2010) **shifted** slightly from the tradable to the non-tradable sector. This is the case for Slovakia, but also for Ireland, France, Cyprus and Malta, and outside the euro area for Bulgaria, the Czech Republic, Lithuania, Hungary and Poland.

In what follows, a closer look is taken at what influences total FDI and the **scope of policy** for affecting it.

Determinants of total FDI

Before turning to an analysis of the benefits and determinants of FDI in the tradable sector, it is useful to review the main determinants of total FDI (tradable and non-tradable) as identified in the economic literature. Why do companies decide to service a foreign market by producing locally, rather than through trade (exports), or to locate production abroad? What are the factors that encourage a firm to invest in a particular location or discourage it from doing so?

To understand the drivers of FDI, the issue should be looked at from two sides. First, that of the **firm** that is considering to invest abroad: what are its motives and are there any inherent characteristics that favour such a decision? Second, from the side of the **destination country**: how can a country attract foreign firms and encourage them to invest domestically?

When considering investing abroad, firms' motives typically include either gaining new markets or improving efficiency, primarily in terms of costs. The former is referred to as **horizontal** and the latter as **vertical** FDI. There is also FDI aimed at exploiting natural resources, which does not necessarily fall into either category. Over the years, however, this traditional classification has become

less meaningful in practice, ⁽²¹⁾ as firms' sourcing strategies and multinationals' integration strategies have become more **complex**. Large multinationals seek to invest in countries that have low costs but then use them as platforms to serve other countries around the world. ⁽²²⁾ In other words, they exploit efficiency gains and seek markets at the same time. It is this type of FDI that will be particularly relevant for rebalancing in the euro area.

Regarding firms' inherent characteristics, evidence shows that firms that engage in FDI are typically larger and more productive than firms that export. In turn, exporting firms are larger and more productive than non-exporting firms. **Productivity** is therefore a crucial factor as firms shift from trading only in the domestic market to trading and possibly investing in foreign markets. A new theory has been developed to allow for a firm's productivity to be a key factor in its production and distribution decisions. ⁽²³⁾ In this respect the structure of the firm is an important determinant in its decision to invest abroad.

Turning to the drivers of FDI from the point of view of the destination country, these can be roughly grouped into two categories: **gravity** and **policy-affected** factors. Gravity factors include the market size of the destination country and other relevant markets, proximity to the source country, language and cultural factors. Policy-influenced factors relate to the general macroeconomic and policy environment and include macroeconomic variables such as per capita income, credit risk and exchange rates. Variables that reflect the level of costs, e.g. production costs, taxes, tariffs, transport costs that add to (dis-)economies of scale, as well as a range of institutional factors, such as the level of education, infrastructure, the rule of law, rigidities, governance and enforcement of contracts, are also potentially important considerations. ⁽²⁴⁾ Empirical studies show that market-seeking (horizontal) FDI is typically affected by the host country's market size, its potential to grow and the absence of market

⁽²⁰⁾ Ideally, one would also look at the composition of flows, but many components are missing.

⁽²¹⁾ Helpman, E., 2006 (see footnote 14).

⁽²²⁾ It is difficult to investigate this empirically as it requires data at the firm level. For an attempt in the case of Japan, see Baldwin, R. and T. Okubo (2012), 'Networked FDI: Sales and sourcing Patterns of Japanese foreign affiliates', *CEPR Discussion Papers* 8963.

⁽²³⁾ Melitz, M. (2003), 'The impact of trade on intra-industry reallocations and aggregate industry productivity', *Econometrica*, 71(6), pp. 1695-1725.

⁽²⁴⁾ Bloniger, B.A. and J. Piger (2011), 'Determinants of foreign direct investment', *NBER Working Paper* 16704.

impediments (e.g. tariffs and transport costs). Efficiency-seeking (vertical) FDI is helped primarily by low-cost labour. ⁽²⁵⁾

In the European context, the existence of cost advantages and a country's membership of the EU encourage investments. ⁽²⁶⁾ Similarly, the evidence shows that being a member of the euro area, or having a clear timeline for joining it, has a positive impact in attracting FDI. This is because, for the most part, euro-area membership eliminates currency risk and promotes a stable macroeconomic environment. Naturally, there are differences between countries. The **corporate tax rate** appears to be important for many European countries. **Unit labour costs** play a major role in some of the more peripheral EU countries, including the 'new' Member States. More generally, however, a well-functioning domestic market and improvements in cost-competitiveness are crucial for attracting FDI.

It is only in the context of a specific country or sector that it is possible to identify which of these factors matter most. However, there is a consensus that gravity factors as a whole explain about 60 % of aggregate FDI, irrespective of the region. ⁽²⁷⁾ This implies that policy can only partially affect the decision to invest in a foreign destination. Furthermore, the extent to which policies can be adjusted is limited by what neighbours and competitors do.

The impact of policies also depends on what is known as **thresholds effects**. ⁽²⁸⁾ When a country first tries to attract foreign investors, there are a number of variables that are of crucial importance. Typically, these are gravity factors relating to culture or distance. As FDI increases, these factors become less relevant and are overtaken by concerns about costs or general macroeconomic

conditions. Such threshold effects may also exist for other variables. For example, a minimum level of infrastructure and education may be required before FDI is even considered.

II.3. FDI in the tradable versus non-tradable sectors

This section looks at FDI in the two composite sectors (tradables and non-tradables) and asks two questions: does the composition of FDI matter for the trade balance and, if so, what can policy do to affect it?

The channels of transmission

There are two channels, **imports and exports**, through which sectoral FDI can affect the trade balance. ⁽²⁹⁾ Both tradable and non-tradable FDI are associated with a temporary increase in demand that feeds into imports. However, the relationship between exports and FDI in the two sectors may differ. Foreign investment in the tradable sector may increase production capacity and thereby raise exports and reduce the deficit. The impact on exports of an increase in FDI in the non-tradable sector is however less clear-cut. On the one hand, the potential reallocation of capital and labour resources from tradables to non-tradables may depress export capacity and damage the external balance. On the other hand, FDI in non-tradables may increase competition in the economy and its overall efficiency. Although, by definition, the non-tradable sector does not contribute to an economy's exporting capacity, many non-tradables are inputs to tradables and efficiency gains in the sector may boost overall competitiveness. This indirect effect is, however, likely to be less strong than the direct effect of FDI in the tradable sector.

Overall, this analysis suggests that an increase in FDI in the tradable sector may be more beneficial to the trade balance (and therefore the current account). If redressing the current account balance is an important issue, which it currently is for a number of euro area countries, policies that promote FDI, in particular in tradable sectors, would facilitate the rebalancing process.

Before following an integrated approach to identify what affects FDI in the tradable sectors, one can

⁽²⁵⁾ Campos, N.F. and Y. Kinoshita (2003), 'Why does FDI go where it goes? New evidence from the transition economies', IMF, WP/03/228.

⁽²⁶⁾ Competitiveness report (see footnote 15) and PriceWaterhouseCoopers (2010), 'Foreign direct investment in central and Eastern Europe: A case of boom and bust?', *Economic Views*, March, come to the same conclusion.

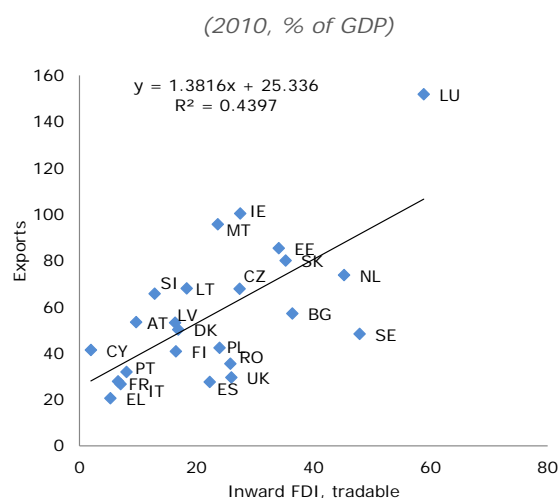
⁽²⁷⁾ Demekas, et al 2005 from above as well as Feenstra, R.C., J.R. Markusen and A.K. Rose (2001), 'Using the gravity equation to differentiate among alternative theories of trade', *Canadian Journal of Economics*, Vol. 34, No. 2; Lim, E.G. (2001), 'Determinants of, and the relation between, foreign direct investment and growth: A summary of the recent literature', IMF, WP/01/175.

⁽²⁸⁾ Demekas, D.G., B. Horvath, E. Ribakova and Y. Wu (2005), 'Foreign direct investment in Southeastern Europe: How (and how much) can policies help?', IMF, WP/05/110.

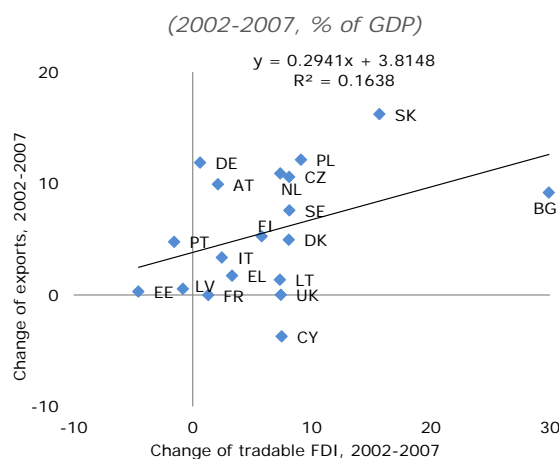
⁽²⁹⁾ Kinoshita, Y. (2011), 'Sectoral decomposition and FDI and external vulnerability in Eastern Europe', IMF, WP/11/123.

take a first look at snapshots of relevant relationships. The data suggest that there is a strong positive correlation between FDI in the tradable sector and exports (see Graph II.7). Ignoring the data for Luxembourg, the relationship is almost one-to-one, i.e. a 1 % increase in the ratio of FDI inward stock in the tradable sector to GDP is associated with a 1 % increase in the ratio of exports to GDP in the medium term. This relationship also holds for pre-crisis years.

Graph II.7: Exports and FDI in tradables



Graph II.8: Change of exports and FDI in tradables

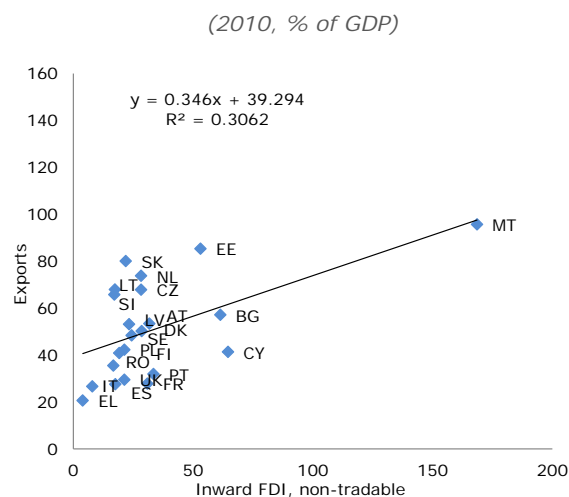


Moreover, this relationship remains positive as regards changes over longer periods. Graph II.8 shows changes for the period from 2002 to 2007 only, since variables in changes are more sensitive

to big disturbances such as those experienced since then.

On the other hand, the link between exports and FDI in the non-tradable sectors, although positive, is much weaker in economic terms (see Graph II.9).

Graph II.9: Exports and FDI in non-tradables



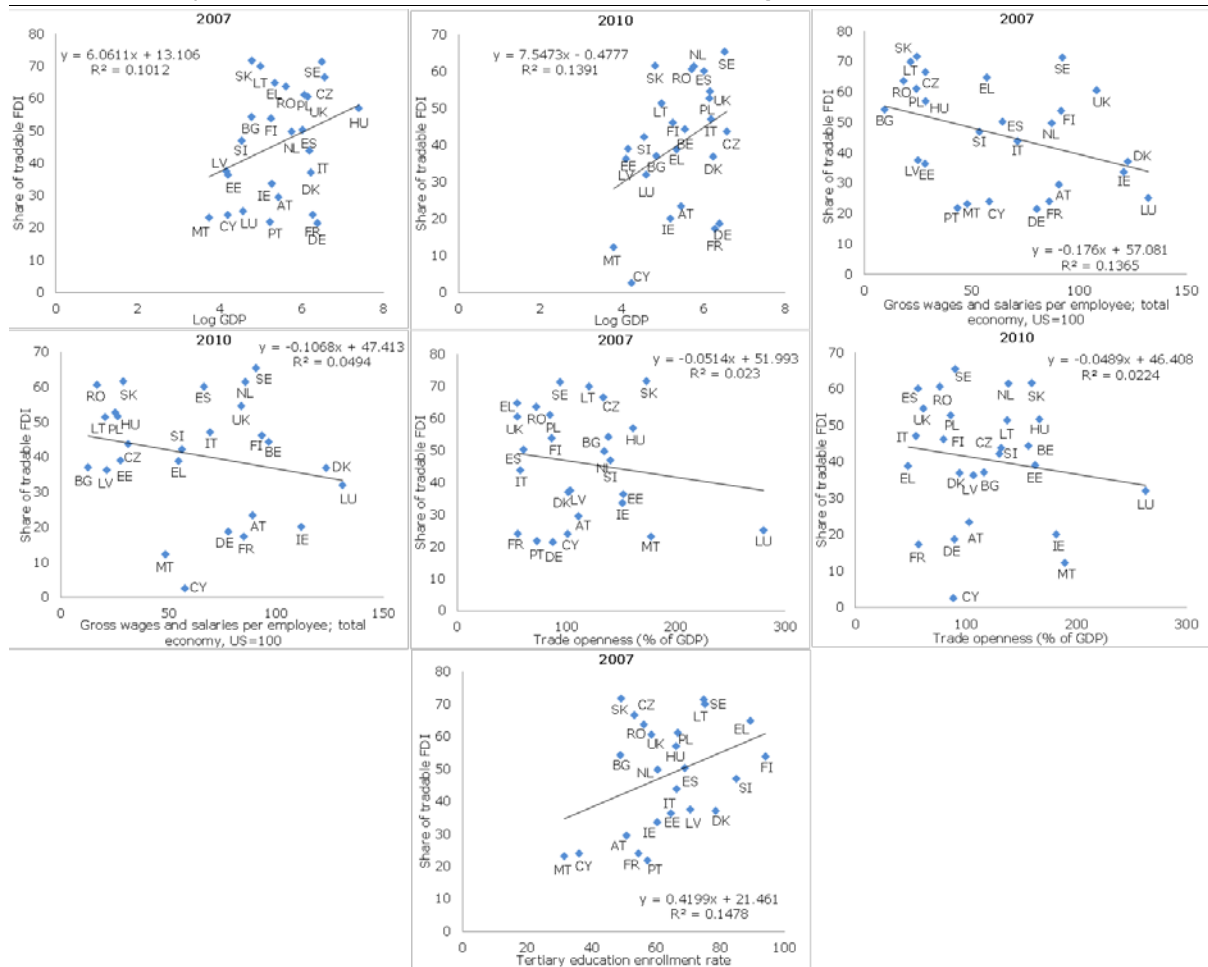
The relationship between imports and FDI in the two sectors is very similar. In this respect, FDI is no different from any other type of investment that has an immediate impact on imports. However, this negative effect (in terms of trade balance) is economically less significant than the effect on exports shown above.

Determinants of FDI in the tradable sector

As mentioned in the previous section, the determinants and effects of overall FDI have been studied extensively in the literature. The results shown above raise the obvious question as to which factors determine the choice of investing in tradable FDI.

Graph I.9 plots the relationship between **FDI in the tradable sector as a share of total FDI** and a number of candidate variables. These variables capture the size of the economy (log GDP), labour costs (wages), openness (exports plus imports as a proportion of GDP) and the level of education (completion of tertiary education as a percentage of the population). While these give an indication of the possible strength of the relationship, a proper

Graph II.10: FDI in the tradable sector and its potential determinants



Source: DG ECFIN calculations based on Eurostat data.

regression framework, the results of which shown in Table II.1, is needed to identify significant determinants. In addition to the variables mentioned above, a proxy for the quality of infrastructure (percentage electricity losses)⁽³⁰⁾ and the distance between Member State capitals and Düsseldorf are also used as regressors.⁽³¹⁾

Table II.1 reports the results for the euro area, the whole of the EU and a subset of EU countries that excludes the 'core' members.⁽³²⁾ The results are broadly in line with standard conclusions in the

literature and are summarised as follows: 1) wage moderation and higher education are two crucial factors in the decision to invest, as they determine the relative attractiveness of the destination country in terms of the cost-to-productivity ratio. This applies to euro-area countries as well as EU Member States in general; 2) a proxy for business infrastructure is relevant for both the euro-area sample and non-core countries; 3) the distance from the source country is relevant only for non-core countries.

However, the relevance of each factor differs between sectors or countries and depends on the existing level of foreign investment. The factors relevant for a country that is just beginning to attract foreign investment would be different from those relevant for one that is already an established FDI destination. Similarly, the levels of different variables also matter. For example, as it increases in quality, the level of infrastructure may also increase in relevance in terms of determining FDI. In other

⁽³⁰⁾ Electricity losses have often been used as a proxy for business-related infrastructures; see, for example, Ahmed S. and Ghani E., (2007), 'South Asia, growth and regional integration: an overview', in 'South Asia, growth and regional integration', Ahmed S. and Ghani E. (eds), The World Bank.

⁽³¹⁾ cf. Kinoshita 2011 (see footnote 29). This variable captures proximity to Germany and is a proxy for the distance between countries, relevant in trade. Ideally, one would need to incorporate the pair-wise distance between countries as done in gravity equations.

⁽³²⁾ See notes in Table I.1 for country composition of the two groups.

words, it is useful to investigate whether **threshold** effects exist. The econometric analysis shows that threshold effects are present in the case of the level of infrastructure although not for the other determinants of FDI in the tradable sector. The results for the infrastructure variable are presented in Graph II.11-II.13.

Table II.1: **FDI in the tradable sector and its determinants (1)**

Variable	Dep. var.: FDI_Tradables/Total FDI		
	EA	EU	Sub-group +
Log (Real GDP)	7.627*** (0.01)	2.899** (0.05)	1.240** (0.02)
Log (Wages)	-19.225*** (0.00)	-15.028*** (0.00)	-13.541*** (0.00)
Trade Openness	0.261 (0.08)	0.028 (0.75)	-0.072** (0.04)
Enrolment in tertiary education	0.501*** (0.00)	0.404*** (0.00)	0.280** (0.03)
Distance to Dusseldorf	5.112 (0.37)	-1.55 (0.73)	-8.381*** (0.01)
Infrastructure (electricity losses)	-1.436*** (0.01)	-0.641 (0.11)	-0.767*** (0.00)
Constant	-16.623 (0.79)	57.611 (0.15)	104.169*** (0.00)
Time dummies	Yes	Yes	Yes
N	115	217	136
No of Instruments	21	21	21
hansenp	n/m	0.179	n/m

(1) Panel data, 1990-2011, EU26 and EA16 (LU omitted), estimated using system GMM; p-values in brackets; + all countries except: AT BE DE DK FI FR IT NL SE UK; ***, ** significance at the 1 and 5 per cent level. Hansen p-value not reported when equal to 1, due to the high number of instruments.

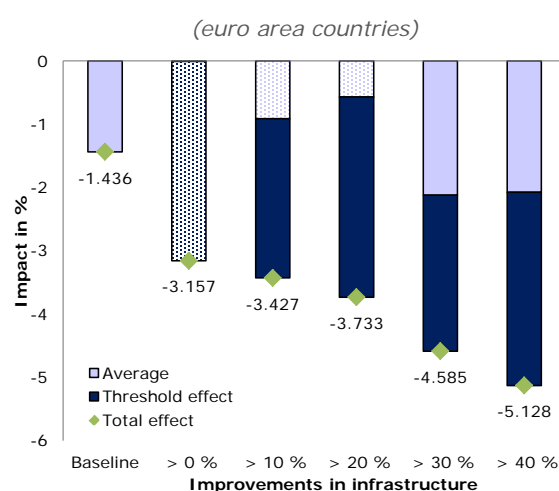
Source: DG ECFIN calculations based on Eurostat data.

Table II.1 shows that the effect of a unit reduction in electricity losses in the euro area (i.e. an increase in the quality of business-relevant infrastructure) is equal to an increase by 1.44 units in the share of FDI in the tradable sector. This represents an average effect across all countries in the euro area and is found to increase if substantial infrastructure improvements had been made since the start of the period. Countries that have had an at least 10 per cent improvement in the quality of their infrastructure had an equivalent effect of 3.43. In other words, with a further one unit improvement, FDI in the tradable sector in these countries will increase by 3.43 units, more than twice the original impact. ⁽³³⁾ The effect also increases with further infrastructure improvement: for a 20 % improvement, it is 3.73, for 30 % it is 4.59 and for 40 % it is 5.13. We also note that the effects described are significant in statistical terms.

⁽³³⁾ This effect is captured with a multiplicative dummy on the variable of infrastructure. The starting period is 1995.

Graph II.11 summarises the effects for the euro area and presents a breakdown of the impact between what is due to the average overall effect and what is the additional effect due specifically to the improvement thresholds considered.

Graph II.11: **Impact of infrastructure improvements on tradable sector FDI (1)**

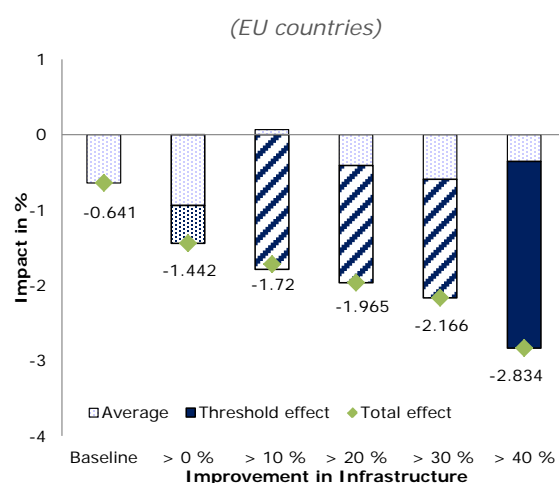


(1) Solid fill represents significance of the coefficient at the 1 % level, striped fill at 5 %, dotted fill represents a non-significant coefficient.

Source: DG ECFIN.

A very similar picture arises for the EU as well as for the sub-group of peripheral countries (Graphs II.12 and II.13 respectively).

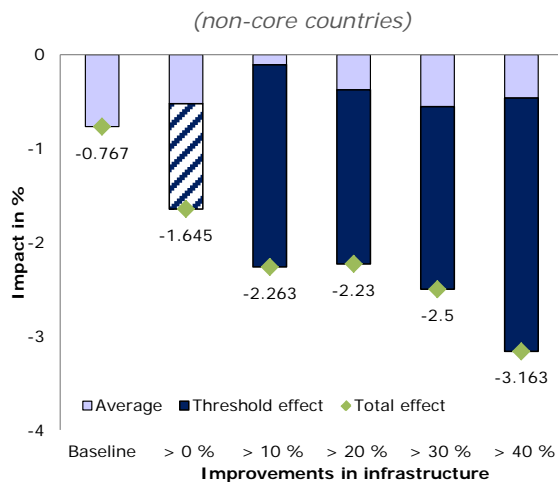
Graph II.12: **Impact of infrastructure improvements on tradable sector FDI (1)**



(1) Solid fill represents significance of the coefficient at the 1 % level, striped fill at 5 %, dotted fill represents a non-significant coefficient.

Source: DG ECFIN.

Graph II.13: **Impact of infrastructure improvements on tradable sector FDI (1)**



(1) Solid fill represents significance of the coefficient at the 1 % level, striped fill at 5 %, dotted fill represents a non-significant coefficient.

Source: DG ECFIN.

The total effect estimated is greater (more negative) and statistically significant than that estimated without any threshold effects. For a 40% improvement in electricity losses, the effect on FDI in tradables is 2.83 units for the EU, and 3.16 units for the non-core MS. The impact of infrastructure improvements in this sub-group as well as the euro area is greater than that in the EU.

Countries that have good infrastructure and continue to invest towards improving it see very

clear benefits in terms of attracting FDI in the tradable sector.

II.4. Conclusions

Low growth and the process of deleveraging currently under way in a number of euro-area Member States make FDI an important alternative to debt-creating capital flows. This focus section has looked at trends in FDI stocks in the euro area in the recent past and has attempted to understand ways in which they can help prevent imbalances from arising. More specifically, it has distinguished between tradable sector and non-tradable sector FDI. This distinction is important, as FDI in tradables has much more obvious potential to improve the trade balance via exports. Therefore, policies that can attract FDI in general, but more importantly in the tradable sector, can help generate growth without risking a build-up of imbalances. Factors that are empirically shown to stimulate this process are wages and education. Controlling for education, the lowering of wages can stimulate FDI in the tradable sector. Similarly, controlling for labour costs, workers' education levels can be an important attractor. Beyond these, the quality of infrastructure and the distance from important industrial centres are also components that encourage FDI in the tradable sector. Overall, the analysis points to three areas where policy action can support tradable FDI: education, wages and business infrastructure.

III. Special topics on the euro area economy

III.1.Recent capital flow developments in the euro area ⁽³⁴⁾

This section examines recent trends in balance of payment flows to and from euro area economies. Current account imbalances have receded in the euro area, reducing vulnerable countries' net funding requirements. This external rebalancing has been largely matched by lower net debt inflows. Furthermore, since the crisis a clear change in the composition of gross capital flows is detectable in the form of the pre-crisis debt bias largely disappearing. The section further assembles evidence of a gradual normalisation of financial market conditions and its impact on both capital flows and sectoral balance sheets, finding that deposit flight and safe haven flows have receded in the second half of 2012. Furthermore, monetary financial institutions appear to be engaging in cross-border debt deleveraging and net claims of central banks on the ECB seem to no longer be building up.

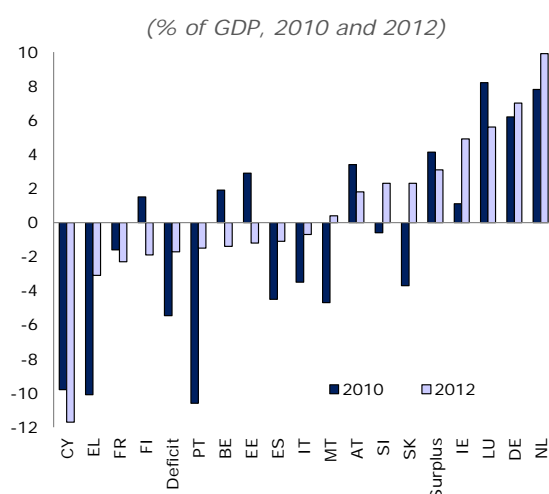
Introduction

The effect of the economic and financial crisis on euro area countries' external positions has been examined recurrently by the European Commission and, as a result, is becoming better understood. ⁽³⁵⁾ Graph III.1.1 shows the narrowing of current account divergences that took place between 2010 and 2012, revealing a substantial improvement in deficit countries' average balances and a more moderate reduction in the average surplus position.

Against the background of pronounced market turmoil, financial fragmentation and redenomination fears, which gripped parts of the euro area in 2011 and 2012, international capital flows have been severely affected at the global and euro area level. ⁽³⁶⁾ Leading on from this, this

special topic examines in more detail the financial flows that form the counterpart to current account positions, in particular concentrating on qualitative and quantitative changes in both net and gross flows of financial capital in economies of the euro area. It further investigates how the external balance sheets of different institutional sectors of euro area Member States have been affected by these financial flow developments.

Graph III.1.1: **Current account positions**



Source: Eurostat.

Developments in net financial flows

The financial account measures the flows of cross-border financial transactions that, in a balance of payments accounting sense, form the necessary counterpart to economic transactions such as goods and services trade that are recorded in the current account. Unless there are large recording errors, omissions, reclassifications or valuation changes in the balance of payments, the financial account should generally behave as a mirror image to the current account, only entered with the opposite sign in the balance of payments.

Two broad types of financial flows can be distinguished for the purpose of the analysis at hand. Debt-type instruments comprise all form of fixed income products (bonds and notes), as well as loans and deposits between residents and non-residents. Equity-type instruments capture all forms of foreign direct investment, as well as portfolio investment in corporate shares. This distinction is both empirically relevant and economically meaningful. Advanced economies

⁽³⁴⁾ Section prepared by Anton Jevcak and Robert Kuenzel.

⁽³⁵⁾ See D'Auria, F., I. in 't Veld and R. Kuenzel (2012), 'The dynamics of international investment positions', *QRE* Vol. 11, No. 3 and Jevcak, A., R. Kuenzel and R. Setzer (2012), 'Capital Flows into vulnerable countries: official and private funding trends', *QRE* Vol. 11, No. 1.

⁽³⁶⁾ For a comprehensive analysis of capital flows in the global and euro area economy see Lane, P.R. (2013), 'Capital flows in the Euro area', *European Economy, Economic Papers*, No. 497.

typically show a higher equity share in foreign liabilities than developing economies (Lane and Milesi-Ferretti 2007). Faria et al. (2007) also find that larger, more open economies with higher institutional quality have a greater equity share in foreign liabilities.

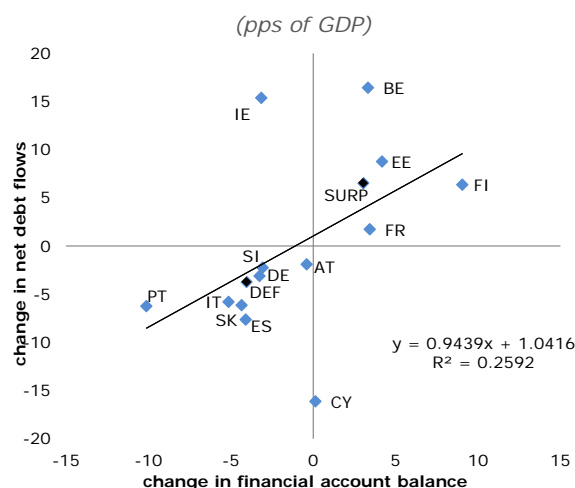
From an economic perspective, equity investment allows for the sharing of macroeconomic risks since the yield return on equity products is state-contingent, as dividends fall or are cancelled in unprofitable times. Debt-type instruments, by contrast, feature a fixed payment schedule whose disruption can fuel adverse feedback dynamics, especially during a financial crisis where the capacity of banks and governments to support distressed debtors falls (Lane 2013 op. cit.). Ultimately, the extent to which a country is able to share and transfer income losses abroad will depend crucially on the size and structure of foreign equity and debt liabilities.

From an aggregate macroeconomic viewpoint, the return on both equity and debt instruments has major determinants in common, including the strength of domestic economic activity and overall credit conditions. However, because the global macrofinancial imbalances that arose prior to the crisis were predominantly debt-related (rather than being obvious equity bubbles), one might therefore expect changes to the macroeconomic outlook during crisis times to particularly affect international debt flows. ⁽³⁷⁾

Returning to the opening observation that current account positions have narrowed particularly on the side of deficit countries since the start of the crisis, Graph III.1.2 plots the change in financial account balances of euro area countries against the change in external net debt flows. The reduction in financial account balances for the group of deficit countries (DEF) corresponds to an improvement in their current account position, while financial account balance of surplus countries (SURP) increased as they reduced their net lending abroad. The regression line further shows that these changes are associated with commensurate changes in debt flows. On average, a 1 p.p. of GDP reduction in the financial account balance is associated with a 0.9 p.p. reduction in net debt

flows. This suggests that the lion's share of external adjustment during the euro area crisis has been met through lower net flows of debt, as might be expected on the basis of the preceding theoretical considerations. This pattern also squares with more generally observed trends of private sector debt reduction in bad economic times. ⁽³⁸⁾

Graph III.1.2: Change in debt and financial account flows between 2010 and 2012



(1) A positive (negative) change signifies an increase in the financial account balance, i.e. higher (lower) net capital inflows or lower (higher) net outflows.

Source: DG ECFIN calculations based on Eurostat data.

Although debt flows are clearly being affected more systematically than equity, ⁽³⁹⁾ the 'debt' category contains a diverse set of assets, and care must be taken in economically interpreting the corresponding flows. Debt comprises not only government and corporate bonds, private sector bank loans and deposits, but also 'TARGET 2' (T2) assets and liabilities ⁽⁴⁰⁾. These notional net claims between euro area central banks (CBs) and

⁽³⁸⁾ See Cuerpo C., I. Drumond, J. Lendvai, P. Pontuch and R.I. Raciborski (2013), 'Indebtedness, deleveraging dynamics and macroeconomic adjustment', *European Economy, Economic Papers*, No. 477 and Ruscher, E. and D. Wolff, 'Corporate balance sheet adjustment: stylized facts, causes and consequences', *European Economy, Economic Papers*, No. 449.

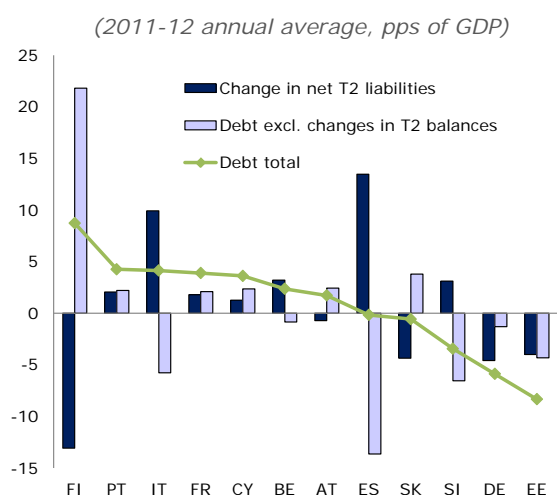
⁽³⁹⁾ A replication of Graph III.1.2 using equity flows on the vertical axis instead shows no correlation at all.

⁽⁴⁰⁾ The Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET) is now in its second generation (TARGET2) and settles cross-border transfers of CB deposits. T2 generates counter-balancing credit claims between each national central bank and the ECB, which are automatically aggregated and netted out at the end of each day. Resulting net claims or liabilities of CBs vis-à-vis the ECB resulting from cross-border T2 payments are included in the monetary authority's contribution to a country's international investment position, while their (transactional) changes are recorded in the BoP under "other investments: loans/currency and deposits".

⁽³⁷⁾ A further reason for this supposition is that credit risk has since the crisis befallen the government sector, which does not issue equity liabilities.

the ECB have risen to prominence since 2011 due to the unique mechanics of intra-euro area capital flight intermediated by the Eurosystem. As demonstrated in a previous edition of the Quarterly Report, T2 balances have to a large extent mirrored net private sector capital flows between euro area members and have thus acted as a stabiliser for the balance of payments during the crisis. ⁽⁴¹⁾

Graph III.1.3: **Net debt flow decomposition**



(1) Change in net T2 liabilities approximated by net flows in Other Investment reported by monetary authorities.

Source: DG ECFIN calculations based on Eurostat data.

The next question therefore should be whether the above association of net debt and financial account flows predominantly reflects changes in T2 balances, and how important (if at all) these have been in overall debt flows of particular Member States.

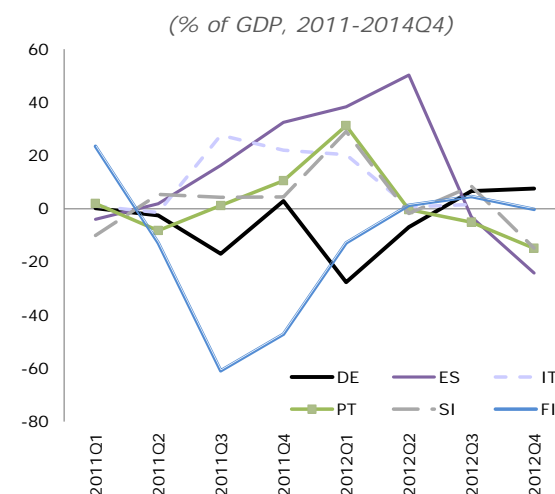
Graph III.1.3 paints a mixed picture for the countries depicted, which are those where net financial flow data related to T2 balances is available. In the majority of countries, the now-familiar pattern of opposing movements between the evolution of net T2 liabilities and non-CB debt flows is visible. Among these countries Italy and Spain stand out, where overall net debt flows were small but masked big shifts in the composition of debt liabilities – in other words, increases in net T2 liabilities reflected private capital outflows. ⁽⁴²⁾ By

⁽⁴¹⁾ See Jevcak, A., R. Kuenzel and R. Setzer (2012).

⁽⁴²⁾ Finland and Portugal show somewhat surprising developments. Finland recorded very large net deposit inflows from non-euro area Scandinavian banks, whose safe-haven reputation attracted large €-denominated deposits from vulnerable Member States. See Section 3.3 of Finland's recent in-depth review: http://ec.europa.eu/europe2020/pdf/nd/idr2013_finland_en.pdf Portugal showed comparatively small T2 balance changes relative

contrast, in 5 of 12 countries changes in net T2 liabilities have been positively correlated with private debt flows, with 3 of these countries (PT, FR and CY) recording net debt inflows. These trends were significant for the 2011-12 period overall, but Graph III.1.4 shows that since mid-2012 changes in T2 balances have largely reversed:

Graph III.1.4: **Quarterly change in net TARGET 2 liabilities**



(1) Change in net T2 liabilities approximated by net flows in Other Investment reported by monetary authorities.

Source: DG ECFIN calculations based on Eurostat data.

After widening significantly in 2011 and remaining high in the first half of 2012 (especially in Spain), net T2 flows have more or less entirely reversed from Q3 onwards. As of Q4 2012, Spain, Portugal, Slovenia and Italy recorded a reduction in net T2 liabilities, while T2 balances also stabilised in Finland and declined in Germany. To the extent that the widening of T2 balances can be interpreted as a reflection of intra-euro area capital flight from vulnerable parts of the euro area, developments in the second half of 2012 would then suggest that these outflows have started to reverse.

Aside from T2 developments, the second half of 2012 also showed a noticeable improvement in underlying private capital flows into vulnerable economies. Portugal, Italy and Spain all showed a noticeable improvement in net 'other investment' if when excluding T2 changes, leaving net flows close to zero in the second half of 2012 following large gyrations in 2010 and 2011. This relative improvement is also evident for portfolio

to IT and ES, and these were limited to Q4 2011 and Q1 2012, reversing sharply in H2 2012.

investment flows in the second half of 2012, as these three economies are all recording net inflows of portfolio investment again as of Q4 2012. This considerable recovery was overwhelmingly driven by returning investment into domestic debt securities, whereas net flows into equity securities have shown only minor fluctuations on a net basis throughout the crisis.

Overall, this normalisation of external funding flows would accord with a more general impression of economic and financial tail risks having been reduced in the euro area and financial markets having somewhat stabilised. Decisive policy actions since the summer of 2012 by Member States and European institutions, including by the ECB, have supported this easing of macrofinancial risks.

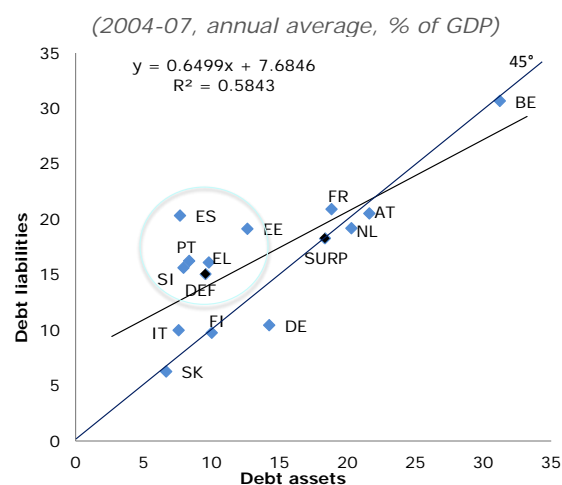
Gross debt flows and external deleveraging

While a reduction in net debt inflows is in principle positive from the perspective of external debt sustainability, everything else being equal, a change in net capital flows may be small compared to the net international investment position (NIIP). This makes a net flow adjustment a necessary, but not sufficient condition for ensuring external debt sustainability. Furthermore, a separate type of macrofinancial risk is associated with large gross external asset and liability positions build up through large gross financial flows, even if net capital flows and thus the NIIP remain unaffected. These risk factors are those commonly associated with financial leverage, i.e. a high (or rising) ratio of financial assets or liabilities to common equity – though in a macroeconomic context, external leverage can be defined as an economy's gross stock of foreign assets or liabilities to GDP. With external leverage liquidity risks increase, as does the value at risk from possible mismatches in the currency, asset and maturity composition of assets and liabilities. It is therefore not surprising that balance sheet shrinkage of various sectors of the euro area economy has been such a ubiquitous hallmark of the crisis aftermath, given the fundamental reduction of risk appetite by economic agents and investors and the perceived widening of tail risks.

Graphs III.1.5 and III.1.6 examine the extent to which external leveraging and deleveraging have been apparent in gross debt flows before and after the crisis. Graph III.1.5 shows that in the pre-crisis period (2004-2007) deficit countries showed a particular bias towards net debt liability

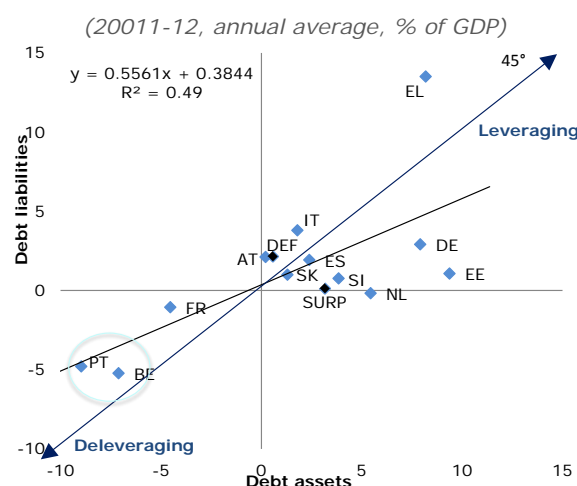
accumulation, while surplus countries flows were debt-neutral on balance; the greater the upwards vertical distance to the 45 degree line, the greater the average annual net inflow of debt. The significantly positive y-axis intercept confirms an overall net debt liability bias, while the slope coefficient below unity implies that this debt bias decreased with overall leverage. These findings square fully with a large body of literature on pre-crisis financial trends.⁽⁴³⁾

Graph III.1.5: Gross Debt Flows



Source: DG ECFIN calculations based on Eurostat data.

Graph III.1.6: Gross Debt Flows



Source: DG ECFIN calculations based on Eurostat data.

By contrast, Graph III.1.6 shows a significant change in gross debt accumulation in the period of 2011-12 for all countries examined. Generally

⁽⁴³⁾ See Lane (2013) for an overview.

speaking, much lower gross debt flows are evident, implying that even where gross flows are still positive, the pace of debt leveraging has slowed down relative to the pre-crisis trend in Graph III.1.5. However, only for countries in the south-western quadrant (BE, PT, FR) can outright debt deleveraging be said to be occurring. Taken in the aggregate, the net debt liability bias has disappeared (intercept close to zero, flatter slope).

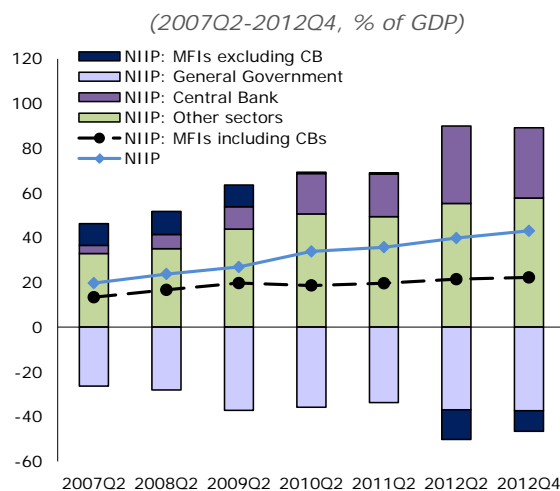
Net IIP developments by sector

The preceding sections have revealed significant quantitative and qualitative changes in capital flows to euro area economies. This final section puts these changes in the context of wider external balance sheet developments in the euro area. Using the quarterly IIP data available in Eurostat, it is possible to assign external assets and liabilities to one of the following four sectors: 1) central bank, 2) general government, 3) monetary financial institutions (MFIs) and 4) other sectors.⁽⁴⁴⁾ However, a complete set of sectoral quarterly IIP data dating back to the outset of financial crisis in summer of 2007 is only available for 10 euro-area countries.⁽⁴⁵⁾ Country-level data are aggregated for countries with a positive net international investment position (NIIP) into “surplus countries” (BE, DE, FI, LU and NL) and, for countries with negative NIIP, “deficit countries” (EE, EL, ES, PT and SL).⁽⁴⁶⁾

Surplus countries

The overall NIIP of surplus countries improved from 20% of GDP in Q2 2007 to 43% of GDP in Q4 2012, but its underlying sectoral composition changed in some cases by even larger magnitudes. As Graph III.1.7 shows, the main change concerns net foreign assets of CBs, which increased by almost 30 p.p. over this period, consistent with the T2 flow developments mentioned earlier, while the NIIP of other sectors (i.e. households and non-financial corporations) also improved by 25 p.p.. By contrast, MFIs’ NIIP shrank by some 20 p.p., and that of general government by about 10 p.p.

Graph III.1.7: Surplus Countries - Sectoral Composition of the NIIP



Source: DG ECFIN calculations based on Eurostat data.

A decomposition of the sectoral NIIP evolution into gross foreign assets and liabilities reveals that the deterioration in the NIIP of MFIs was mainly induced by a reduction in its gross foreign assets, suggesting cross-border deleveraging. On the other hand, the deterioration in the NIIP of the general government was driven by an increase in its gross foreign liabilities, ostensibly due to greater safe-haven inflows of debt financing. At the same time, the improvement in the NIIP of CBs and other sectors was induced by increases in their gross foreign asset holdings, in the former case related to rising T2 balances. This suggests that CB deposit inflows and related increases in T2 balances of CBs in surplus countries⁽⁴⁷⁾ were mainly driven by falling exposure of the domestic financial sector to other parts of the euro area⁽⁴⁸⁾, accentuated by increased non-resident holdings of domestic government securities due to “flight-to-safety” financial flows. On the other hand, the surplus of domestic savings over investment seems to have been mainly channelled into the accumulation of foreign assets by the non-financial private sector.

⁽⁴⁴⁾ This includes households and non-financial corporations. Direct investment positions are wholly attributed to this sector.

⁽⁴⁵⁾ These are Belgium, Germany, Estonia, Greece, Spain, Finland, Luxembourg, Netherlands, Portugal and Slovenia

⁽⁴⁶⁾ The deficit and surplus groupings in this section aim to match the preceding section in as far as possible, given different data availability between BoP flow and stock data. The main difference is the inclusion of Greece in the stock data of this section, unlike in the preceding part, where no recent data is available.

⁽⁴⁷⁾ As far as financial account flows are concerned, CB deposit inflows can either be generated by a reduction in gross foreign assets or by an increase in gross foreign liabilities. While changes in the IIP can in principle also result from valuation effects, these do not affect T2 balances, which are denominated in euro at fixed values and are thus only affected by BoP flows.

⁽⁴⁸⁾ For example, after an increase from below €200bn in 1999 to above €750bn by late 2008, claims of banks located in Germany on entities located in euro-area member states with negative NIIPs in 2012 (FR, IT, ES, PT, EL, CY, SL, IE, SK, EE) started to decline rapidly, falling to below EUR 450bn by end-2012.

Some reversals in the aforementioned longer-term trends in sectoral NIIPs could be observed in the second half of 2012. The NIIP of CBs peaked at 35% of GDP in Q2 2012 before contracting to 31% of GDP by the end of 2012. At the same time, the NIIP of the MFI sector excluding CBs improved over the second half of 2012, while the NIIP of the general government sector broadly stabilised.

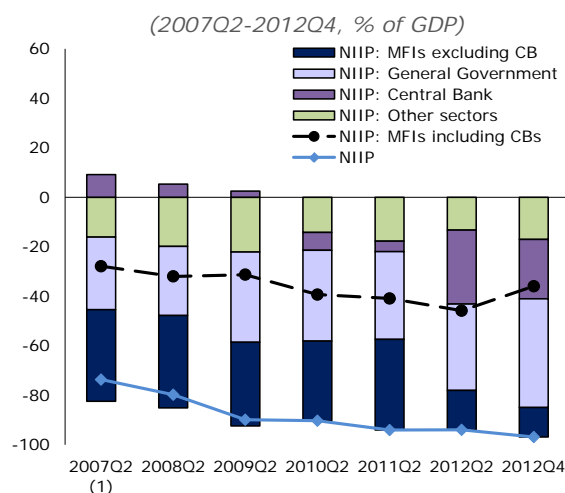
Deficit countries

Graph III.1.8 plots the corresponding NIIPs for deficit countries. The deterioration in the NIIP of deficit countries from -74% of GDP in Q2 2007 to -97% of GDP in Q4 2012 was also accompanied by substantial changes in sectoral NIIPs. While the NIIP of CBs deteriorated by more than 30 p.p., again in line with T2 trends, MFIs excluding CBs improved their NIIP by 25p.p.. In addition, the NIIP of the general government sector also declined by almost 15p.p.. The NIIP of other sectors, however, did not exhibit a clear trend, remaining broadly unchanged over the period.

Domestic MFIs improved their NIIP in a balanced manner by both increasing their foreign asset holdings and by decreasing their foreign liabilities. On the other hand, the deterioration in the NIIP of CBs stems fully from the increase in their gross foreign liabilities, driven by rising T2 liabilities. In addition, the further decline in the NIIP of the general government sector also resulted from an increase in its gross foreign liabilities. Overall, this suggests that net outflows of CB deposits resulting in growing T2 liabilities of CBs in deficit countries were mainly driven by the domestic commercial banking sectors which acquired foreign assets (flight to safety) while also repaying their external liabilities. At the same time, the gap between the level of domestic savings and investment seems to have been predominantly covered by foreign borrowings of the general government sector.

Latest data show the NIIP of CBs improving in deficit countries throughout the second half of 2012 to -24% of GDP by end-2012. The recent reversal in net CB deposit flows was likely mainly related to the non-resident funding of the general government sector, which increased over the second half of 2012 (after having broadly stagnated since mid-2009) as MFIs continued to reduce its net foreign liabilities.

Graph III.1.8: Deficit Countries - Sectoral Composition of the NIIP



(1) 2007Q4 data used for Greece.

Source: DG ECFIN calculations based on Eurostat data.

Conclusions

External adjustment during the euro area crisis has been largely met through lower net inflows of debt, as theory would suggest. The pace of gross foreign debt accumulation slowed considerably in the period of 2011-12 for all countries examined, while the pre-crisis bias towards net debt accumulation has disappeared. However, outright debt deleveraging has so far been observed only in three countries (BE, PT, FR). Furthermore, analysis of recent capital flows to and from euro area economies suggests a relative normalisation in the sense that the previous built-up of T2 claims has begun to reverse. Furthermore, there are signs in more vulnerable economies that portfolio capital flows are returning as sources of external funding.

Sectoral analysis of NIIPs suggests that cross-border deleveraging of MFIs accounted for most of the net inflows of CB deposits and the related increase in T2 claims of CBs in surplus countries. Increased non-resident holdings of domestic government securities, arguably related to "flight-to-safety" financial flows, will have also contributed to this. On the other hand, net outflows of CB deposits from deficit countries resulted in growing T2 liabilities of CBs and were mainly related to cross-border activities of domestic MFIs, which acquired foreign assets and simultaneously also lowered their external liabilities. Nevertheless, these longer-term trends have begun to be reversed in the second half of 2012, in line with a relative financial market stabilisation in this period.

III.2. Inventory developments in the euro area since the onset of the crisis ⁽⁴⁹⁾

This section analyses the changes in inventory behaviour in the euro area since the onset of the global financial crisis. Despite the fact that inventory investment is only a small part of fixed investment it contributes significantly to variation in GDP growth. National accounts show that the crisis has led to depressed inventory investment, thus pushing down growth. The change in firms' inventory behaviour since the crisis is also visible in industry survey responses which suggest that firms are now adjusting their inventory stocks downwards more strongly than before. An econometric analysis for Germany, Italy and France indicates that this change in behaviour may in part be ascribed to depressed sales prospects in the wake of the sovereign debt crisis. In addition, financing constraints affect inventory decisions and have become more important since the beginning of the crisis. This further confirms that restoring the flow of credit, especially to smaller firms, is of critical importance for growth.

The dynamics of inventory investment in the national accounts

Firms can hold inventories to smooth production. They respond to higher demand by drawing down inventories when marginal production costs rise with output. Empirical evidence shows, however, that at the aggregate level sales vary less than production and that inventories are procyclical. Another reason for firms to hold inventories is that they are afraid of missing unexpected increases in demand if left with insufficient output stocks. Production decisions are made before demand is known and firms tend to produce output both in order to meet demand and to keep stocks of unsold goods as a precaution. This could explain the procyclicality of inventories. ⁽⁵⁰⁾

Inventory investment in the euro area Member States is reported in the national accounts, with inventory accumulation and decumulation

contributing significantly to changes in output. ⁽⁵¹⁾ In the euro area, inventories' contribution to GDP growth fluctuations since 2008 has been nearly 19%, even if inventories represented only 0.5% of fixed investment and 0.1% of GDP in 2012 (Table III.2.1). The contribution of inventory investment to GDP growth dynamics is relatively large in France, Portugal, Ireland and Italy, as it is in the UK and the US. Since the onset of the crisis, it has risen in most euro area Member States, except the Netherlands, Spain and Greece. The increase is especially pronounced in Germany, Italy, Portugal and Ireland. ⁽⁵²⁾

Table III.2.1: **Contribution of inventory investment to GDP fluctuations (1)**

	(in %)	
	2000-2007	2008-2012
EA 17	17.5	18.6
US	18.2	25.2
UK	30.2	31.1
JP	26.5	12.6
DE	6.1	17.2
FR	42.0	45.0
IT	5.9	29.1
ES	13.4	2.0
IE	-14.3	-44.0
PT	0.1	23.3
GR	37.7	0.5
NL	12.6	10.7
FI	15.6	20.4

(1) Covariance of the annual inventory investment change and the GDP change as a share of the variance of the annual GDP change; current prices (not seasonally adjusted) in DE, GR and FI; previous year's prices (seasonally adjusted) in EA 17, ES, FR and IT; constant prices (seasonally adjusted) in IE, NL, PT, UK, US and JP; quarterly frequency.

Source: DG ECFIN calculation based on Eurostat data.

Euro-area national accounts do not provide data on inventory stocks, but in the US, where such data are available, the ratio of inventory holdings to sales shows a downward trend, falling to around 1.3% of GDP in March 2013. ⁽⁵³⁾ Improvements in the production process, especially just-in-time operations management, facilitated by advances in information technology, have contributed to the

⁽⁴⁹⁾ Section prepared by Plamen Nikolov.

⁽⁵⁰⁾ Research on inventories has tried to reconcile their stabilising role at firm level with their large contribution to fluctuations in economic activity at macro level. For an overview, see Blinder, A.S. and L.J. Maccini (1991), 'Taking stock: a critical assessment of recent research on inventories', *The Journal of Economic Perspectives*, Vol. 5, No. 1, pp. 73-96.

⁽⁵¹⁾ Inventory investment in national accounts covers changes in the stocks of final products, inputs and work-in-process.

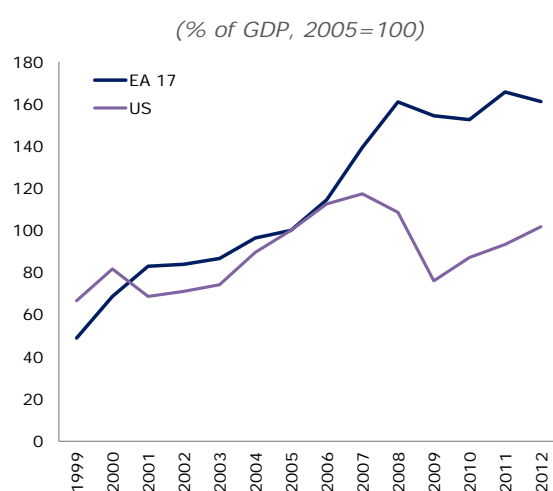
⁽⁵²⁾ In Ireland, the increase is measured in absolute terms since the change in inventory investment and GDP growth move in opposite directions.

⁽⁵³⁾ According to data published by the OECD inventory stocks in the French non-financial corporate sector have been continuously decreasing as a share of GDP since the late 1970s.

decrease in the relative weight of the stock of input inventories in sales. ⁽⁵⁴⁾

The sharp downturn of economic activity since 2008 had a large impact on inventories. Inventory stocks constructed from national accounts have fallen below the level determined by their pre-crisis trend in both the euro area and the US (Graph III.2.1). The significant effects of the crisis are also evident at Member State level. A steep drop during 2009 is observed in all euro area Member States, with the exception of Spain. ⁽⁵⁵⁾

Graph III.2.1: **Inventory stocks (1)**



(1) Based on inventory investment reported in the national accounts. Stocks of inventories are calculated by adding up inventory investment flows.

Source: Eurostat.

A proper focus on inventory behaviour at the macro level requires a look at both inventory stocks and flows. Since inventory stocks are not included in the national accounts, other sources of information are used here: on the one hand, qualitative responses regarding stocks of finished products in industry surveys and, on the other

hand, data on inventory stocks aggregated from firm accounts by sector of economic activity and firm size.

Post-crisis changes in inventory assessment according to industry surveys

The Industry Survey, part of the Joint Harmonised EU Programme of Business and Consumer Surveys coordinated by the European Commission, contains a question about the estimated level of output inventories. ⁽⁵⁶⁾ Firm managers respond by indicating whether they consider stocks of finished goods to be too high, adequate or too low. Another question asks whether firm managers expect output in the months ahead to increase, remain unchanged or decrease. There is normally an inverse relationship between answers to these two questions, as firms reporting an excessively high level of inventories tend to adapt their production plans downward so as to correct the excess. ⁽⁵⁷⁾

The scatter plot of standardised answers to the questions on output inventories and expected production shows that, in the past 18 months, firms have become unusually cautious about accumulating inventories (Graph III.2.22). The observations since September 2011 (in dark blue on the graph) are too far to the left and below the fitted line in the scatter plots (which represents the long-term relationship between the two variables). This indicates that firms now tend to revise their production plans downwards more steeply, in case of excess inventories, than in pre-crisis years. This is particularly true in Italy and Spain, but can also be seen in Germany and France.

The reasons for such behaviour could be found in the depressed demand prospects in the euro area after the escalation of the sovereign debt crisis in 2011. Adverse credit conditions could have played a role as well, for example in limiting the scope for building inventory stocks. ⁽⁵⁸⁾

⁽⁵⁴⁾ There is a difference in the variation of output and input inventories, which are lumped together in the national accounts. US stock data show that both the variability and the GDP share of input inventories have decreased relatively more in recent decades, as compared with that of stocks of finished goods. This can be explained, at least partially, by the technological improvements in the production process. Therefore the variability of inventory investment as measured in the national accounts should be smaller than the variability of stocks of finished goods as measured at firm level and aggregated. See Maccini, L.J., and A. Pagan (2013), 'Inventories, fluctuations and goods sector cycles', *Macroeconomic Dynamics*, 17, pp. 89-122.

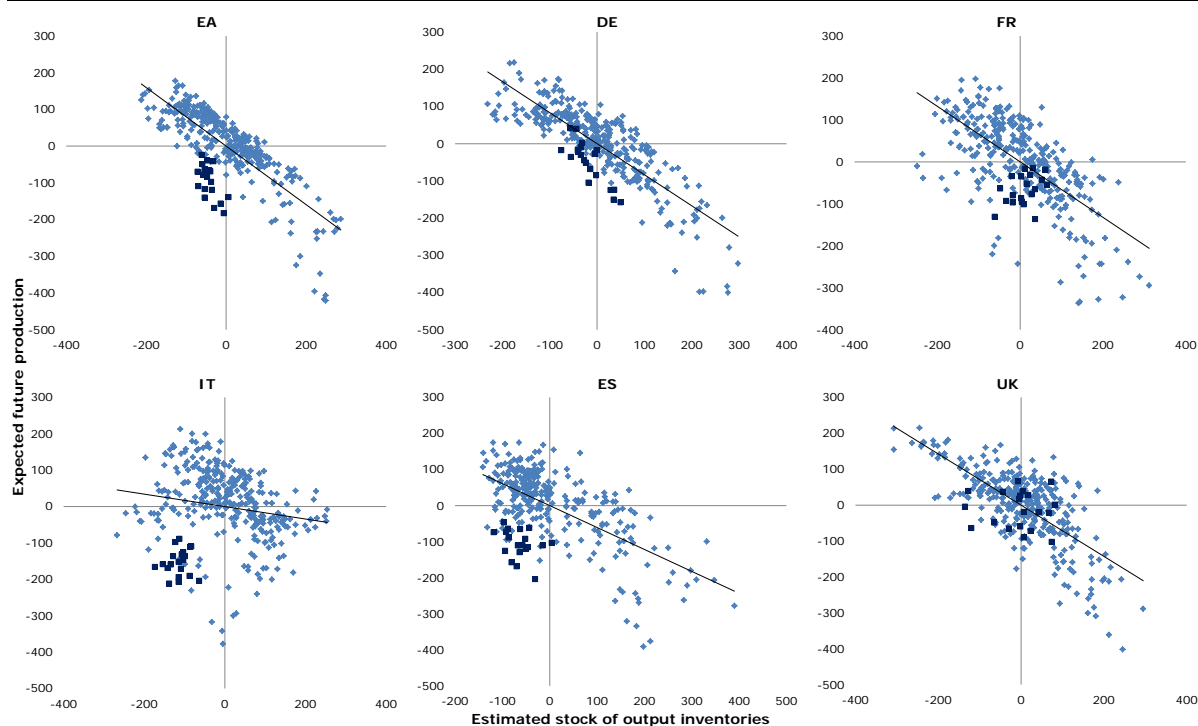
⁽⁵⁵⁾ Data for the non-financial corporate sector in Spain does reveal a steep fall in the ratio of inventory investment to gross value added, although the ratio of inventory investment in the total economy to GDP does not fall as dramatically.

⁽⁵⁶⁾ More information can be found at http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm.

⁽⁵⁷⁾ At the aggregate level, this relationship is not perfectly linear, as movements in output inventories are also determined by other factors, such as the level of expected demand.

⁽⁵⁸⁾ In Germany adverse credit conditions are likely to be an issue only for small firms and to a lesser extent than in the euro area periphery. The ECB's Survey on the Access to Finance to SMEs shows that 11% of the German SMEs and 3% of the German large firms named access to finance as their most pressing

Graph III.2.2: Stock of output inventories vs expected future production (1)



(1) Standardised balances of monthly responses, dark blue markers indicate observations after September 2011.

Source: BCS Survey.

Estimated inventory levels among British firms are not particularly low given their expected future production, indicating that problems with economic uncertainty and access to credit in the euro area may be key explanations.

Estimating inventory stocks in manufacturing by sector of economic activity and firm size

Inventory stocks derived from firm accounts and aggregated by sector of economic activity and firm size are available in BACH, a database managed by the European Committee of Central Balance-Sheet Data Offices (ECCBSO).⁽⁵⁹⁾ The database allows a more detailed look at the relationship between inventory stocks and financial positions at sectoral level and according to firm size.

Box III.2.1 presents results from country inventory regressions for Germany, France and Italy.⁽⁶⁰⁾ The

inventory stock in the panel regressions is determined by growth in sales and in cash flow, labour costs and the real interest rate. The cross-sectional dimension of the BACH time series consists of the different sectors of economic activity in manufacturing, according to the European industrial activity classification (NACE Rev. 2).

The inventory literature usually motivates the inclusion of sales with the need to capture firm responses to changes in demand.⁽⁶¹⁾ Results from the panel regressions in Box III.2.1 show that deteriorating demand prospects, measured by a decrease in sales, would impact inventory stocks negatively.

problem in the second half of 2011. This compares to 29% of Spanish SMEs and 26% of Spanish large firms.

⁽⁵⁹⁾ The European Committee of Central Balance-Sheet Data Offices (ECCBSO) is an informal body whose members come from National Central Banks or Statistical Offices in EU Member States.

⁽⁶⁰⁾ The econometric analysis is restricted to the three largest euro area Member States for data availability and consistency reasons. In these three countries, aggregated data derived from firm

accounts reported in BACH are consistent with data in the national accounts.

⁽⁶¹⁾ This includes production smoothing, minimizing inventory holding costs and avoiding stockouts, see Maccini L.J., B.J. Moore and H. Schaller (2004), 'The interest rate, learning, and inventory investment', *The American Economic Review*, Vol. 94, No. 5, pp. 1303-1327. This paper attributes a positive coefficient on sales in a regression of inventory stocks to the domination of stockout avoidance over production smoothing.

Box III.2.1: Estimating an inventory equation with BACH data

Inventory stocks derived from firm accounts and aggregated by sector of economic activity and firm size are available in BACH, a database managed by the European Committee of Central Balance-Sheet Data Offices (ECCBSO). The database provides a more detailed insight into the relationship between inventory stocks and financial positions at sectoral level and according to firm size.

BACH data on inventory stocks are obtained by aggregating individual firms' accounts and reported by European industrial activity classification (NACE Rev. 2) and firm size in terms of total sales. To be sure that any conclusion regarding inventory behaviour derived from the aggregated micro data can be extrapolated to the macroeconomic level, checks were carried out for consistency between inventory investment in all sectors together, as reported in BACH and in the national accounts. Data for Germany, France and Italy show the same dynamics in both the national accounts and BACH. The sectoral representation in these countries is also quite good. BACH data for 2011 covers manufacturing firms that generate 86% of total sales in France, 78% in Italy and 71% in Germany.

The empirical strategy is to estimate panel regressions of the sectoral annual data for each country separately. The panels represent different sectors of economic activity in manufacturing. The resulting inventory equations show the stock of inventories as a function of the growth in sales and the change in cash flow (proxied by gross profits to sales), the wage share in gross value added and the real interest rate. The change in cash flow captures the need for external finance and the borrowing terms. In general, this specification follows empirical strategies in Maccini et al. (2004) and Kashyap et al. (1994). Limitations of the panel dimensions mean that it is not possible to estimate a partial adjustment model.

The estimated equation is:

$$\log(inv_{it}) = C + \beta_1 \Delta \log(sales_{it}) + \beta_2 wage\ share_{it-1} + \beta_3 \Delta cash\ flow_{it} + \beta_4 \Delta cash\ flow_{it} * crisis + \beta_5 int.\ rate_{it} + crisis + e_{it}$$

where i denotes sector and t is time. The constant contains the fixed effect. The crisis dummy covers 2009-11.

Changes in cash flow affect the stock of inventories. The greater the increase in the cash flow, the bigger the stock of inventories, as firms are less constrained in building up finished goods. Regression results show that the change in the cash flow has always been a meaningful regressor in France, while it has become such in Germany and Italy since the crisis. In these two countries, the real interest rate becomes statistically significant only when the role of cash flow after the crisis is acknowledged.

Results from panel regressions of inventory stocks

	FR (1)	DE (1)	DE (2)	DE (3)	IT (1)	IT (2)	IT (3)
log inventory stock							
Δ in log sales	0.40*** (0.000)	0.45*** (0.000)	0.52*** (0.000)	0.75*** (0.000)	0.26*** (0.009)	0.32*** (0.000)	0.18 (0.239)
wage share (-1)	-0.014** (0.013)	-0.007 (0.351)	-0.006 (0.145)	-0.016*** (0.008)	-0.002 (0.607)	-0.001 (0.822)	0.012** (0.011)
Δ in cash flow	0.027** (0.016)	-0.000 (0.988)			-0.009 (0.413)		
Δ in cash flow*crisis			0.016** (0.014)	0.021*** (0.002)		0.008* (0.075)	0.014*** (0.000)
real interest rate	-0.006 (0.746)	-0.027 (0.216)	-0.038** (0.018)	-0.039** (0.046)	-0.014 (0.369)	-0.043** (0.031)	-0.050*** (0.003)
crisis			0.000 (1.000)	-0.077** (0.020)		0.044 (0.120)	-0.060* (0.076)
constant	16.02*** (0.000)	15.47*** (0.000)	15.43*** (0.000)	14.63*** (0.000)	15.07*** (0.000)	15.26*** (0.000)	13.68*** (0.000)
Estimation	FE OLS	FE OLS	FE OLS	FE OLS	FE OLS	FE OLS	FE OLS
No. observations	198	220	220	220	242	242	220
No. groups	18	20	20	20	22	22	20
R-sq	0.16	0.16	0.21	0.34	0.08	0.10	0.21

Note: DE (3) and IT (3) include data only from firms with annual sales of less than €10 million. FR (1) excludes manufacture of electrical goods, electronics and machinery.

(Continued on the next page)

Box (continued)

Since the onset of the crisis small firms in Germany and Italy adjust their inventory stocks downwards to a greater extent than large firms. This effect is more pronounced in Italy where the cash flow coefficient almost doubles when the regression includes only small firm data. The crisis dummy becomes significant in both countries, indicating that additional factors prompt smaller firms to decrease their inventory stocks since the beginning of the crisis.

References

Kashyap A.K., O.A. Lamont and J. C. Stein (1994), 'Credit conditions and the cyclical behaviour of inventories', *The Quarterly Journal of Economics*, Vol. 109, No. 3, pp. 565-592.

Maccini L.J., B.J. Moore and H. Schaller (2004), 'The interest rate, learning, and inventory investment', *The American Economic Review*, Vol. 94, No. 5, pp. 1303-1327.

Cash flow (proxied by the ratio of gross profit to total sales) is included in order to represent the external financial constraints faced by firms. In line with the literature on credit constraints, higher cash flow should be associated either with less need for, or with better access to, external credit. Facing lower credit constraints, firms should be able to accumulate higher stocks of inventories and thus the coefficient of cash flow is expected to be positive.

Regression results in Box III.2.1 confirm these expectations in all three countries. In Germany and Italy, however, the cash flow variable has become meaningful only since 2009, suggesting that financing constraints, particularly for small firms, have played a bigger role in driving inventories since the onset of the crisis.

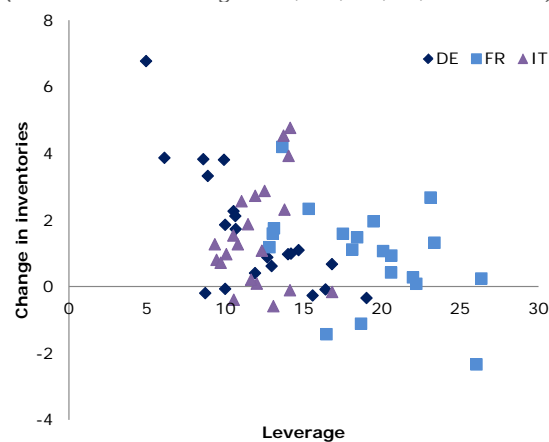
The importance of external financial constraints for inventory behaviour has also been acknowledged in the empirical literature.⁽⁶²⁾ Previous research has shown that, in the presence of information asymmetries, fluctuations of internal finance or firm liquidity positions may play a role in inventory behaviour.⁽⁶³⁾ When inventory accumulation depends positively on firms' financial positions, the tight association of credit and the business cycle will translate into lower stocks during downturns. In periods of weak economic activity, firms display lower operational

performance and deteriorating balance sheets. They find it more difficult to secure external funding, including for stocking up on inventories.

One would a priori expect financing constraints to be more binding for smaller firms that are more dependent on bank credit. This is confirmed by the econometric analysis which shows that the impact of cash flow on inventory stocks is higher in small firms. This result is particularly pronounced in Italy where the cash flow coefficient almost doubles when the regression includes only small firm data.

Graph III.2.3: Leverage vs change in the inventory stock by sector (1)

(small manufacturing firms, DE, FR, IT, 2011 in %)



(1) Leverage is the ratio between non-current debt and total assets. Change in the inventory stock is the difference between the ratio of inventory stocks to sales in 2011 and its 2000-07 average. Small firms are those with annual sales of less than € 10 million.

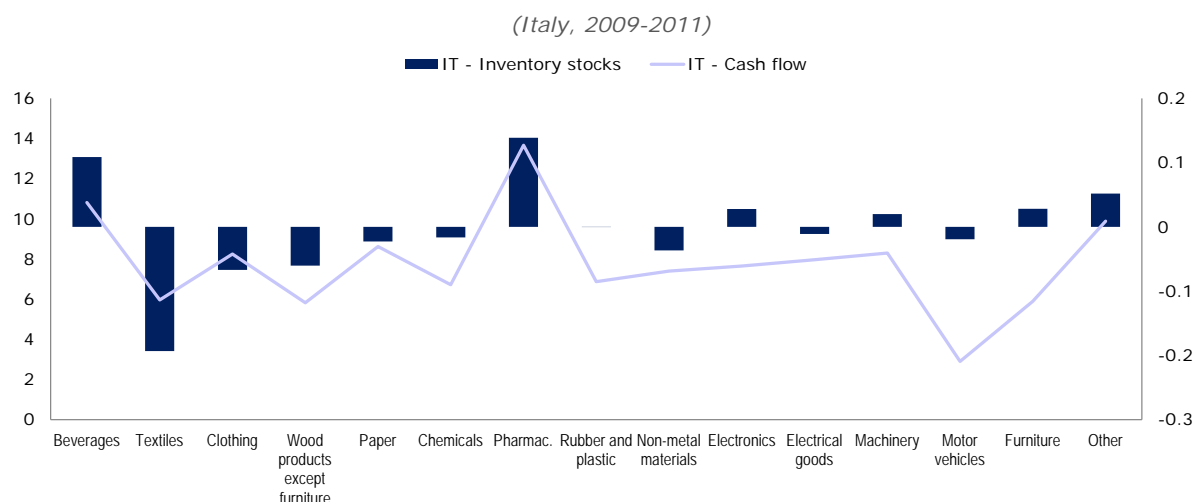
Source: BACH.

⁽⁶²⁾ See for example Bernanke, B.S. and M. Gertler (1995), 'Inside the black box: the credit channel of monetary policy transmission', *The Journal of Economic Perspectives*, Vol. 9, No. 4, pp. 27-48.

⁽⁶³⁾ See Carpenter R.E., S.M. Fazzari and B.C. Petersen (1994), 'Inventory investment, internal-finance fluctuations, and the business cycle', *Brookings Papers on Economic Activity*, Vol. 1994, No. 2, pp. 75-138 and Kashyap A.K., O.A. Lamont and J. C. Stein (1994), 'Credit conditions and the cyclical behaviour of inventories', *The Quarterly Journal of Economics*, Vol. 109, No. 3, pp. 565-592.

The role of financing constraints for smaller firms can also be seen in Graph III.2.34, which shows the importance of leverage for inventories since the start of the crisis. The higher the debt-to-total assets ratio in a given sector, the bigger the drop in

Graph III.2.4: Average deviations of inventory stocks and cash flow by manufacturing sector, (1)



(1) Difference between actual inventory stocks and stocks estimated by a sector panel regression (right axis, natural logs). Cash flow is gross profit divided by sales (left axis, %). Sectors follow the European industrial activity classification (NACE Rev. 2).

Source: BACH, DG ECFIN calculations.

inventory stocks relative to sales from their pre-crisis average. This can be explained by financial constraints relating to indebtedness that are more binding for smaller firms, as they tend to be more dependent on bank lending than their larger counterparts.

Finally, the econometric framework of Box III.2.1 can also be used to explore the role of financing constraints at sector level. There is a clear correlation between cash flow and the unexplained part of inventory stocks in the panel regressions of the Italian manufacturing sectors since the onset of the crisis (Graph III.2.43). Sectors that tend to have higher ratios of gross profits to total sales, and are therefore likely to have higher quantities of liquidity at their disposal, also keep more inventory stocks than predicted by the equation.

Conclusion

Inventory behaviour has important macroeconomic implications. Although inventory investment and inventory stocks are both small relative to GDP, they contribute quite significantly to macroeconomic fluctuations. Firms' inventory behaviour seems to have changed since the onset of the crisis. The role of inventory flows in output fluctuations has grown in several euro area

Member States and the accumulation of inventories seems to have fallen below levels suggested by pre-crisis trends. This change in behaviour is also visible in industry surveys, which indicate that firms are responding more strongly to excess inventories than before.

The econometric analysis for the three largest euro area countries presented in this section, suggests that this change in behaviour may in part be ascribed to depressed sales prospects in the wake of the sovereign debt crisis. In addition, the importance of financial constraints for inventory behaviour has recently increased. This is an additional channel through which tight credit conditions affect the economic outlook. As pointed out by Carpenter et al. (1994), inventory stocks are a substantial part of a firm's total assets. Inventory stocks can be liquidated fast when the firm is cut from external sources of funding and needs cash at short notice. During downturns, tight credit conditions and deteriorating balance sheets are likely to combine with expectations of depressed future demand in providing strong incentives for inventory decumulation. Lower inventory investment feeds in turn into the slowdown in activity. Restoring the flow of credit, especially to smaller firms, is therefore a pre-requisite for a return to growth.

IV. Recent DG ECFIN publications

1. Fellowship initiative on growth and the future of EMU

European Economy. Economic Papers. 498. April 2013

Charles Wyplosz, Graduate Institute of International and Development Studies, Geneva and CEPR

Europe's Quest for Fiscal Discipline

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp498_en.pdf

European Economy. Economic Papers. 497. April 2013

Philip R. Lane, Trinity College Dublin and CEPR

Capital Flows in the Euro Area

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp497_en.pdf

European Economy. Economic Papers. 496. April 2013

Dirk Schoenmaker, Duisenberg School of Finance, Amsterdam

Post-Crisis Reversal in Banking and Insurance Integration: An Empirical Survey

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp496_en.pdf

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Dirk Schoenmaker, Duisenberg School of Finance, Amsterdam

An Integrated Financial Framework for the Banking Union: Don't Forget Macro-Prudential Supervision

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp495_en.pdf

European Economy. Economic Papers. 494. April 2013

Niccolò Battistini, Rutgers University; Marco Pagano, Università di Napoli Federico II, CSEF, EIEF and CEPR; Saverio Simonelli, Università di Napoli Federico II and CSEF

Systemic Risk and Home Bias in the Euro Area

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp494_en.pdf

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Maurice Obstfeld, University of California (Berkeley), NBER and CEPR

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Daniel Gros, Centre for European Policy Studies (CEPS); Cinzia Alcidi, CEPS

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Giuseppe Bertola, EDHEC Business School and CEPR

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Michael Bergman, University of Copenhagen; Michael M. Hutchison, University of California; Svend E. Hougaard Jensen, Copenhagen Business School

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http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp489_en.pdf

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Wage Bargaining Institutions – from crisis to crisis

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp488_en.pdf

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Innovation Policy and Economic Growth

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp482_en.pdf

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A. B. Atkinson, Nuffield College, Oxford and Institute for New Economic Thinking at the Oxford Martin School, University of Oxford

Ensuring social inclusion in changing labour and capital markets

http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp481_en.pdf

2. Occasional Papers

European Economy. Occasional Papers. 152. June 2013

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The 2013 Stability and Convergence Programmes: An Overview

http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp152_en.pdf

European Economy. Occasional Papers. 151. June 2013

Christine Frayne and Stéphanie Riso

Vade mecum on the Stability and Growth Pact

http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp151_en.pdf

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- European Economy. Occasional Papers. 150. May 2013
Christine Frayne, Elizabeth Jaffee, and Stéphanie Riso
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- European Economy. Occasional Papers. 149. May 2013
The Economic Adjustment Programme for Cyprus
http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp149_en.pdf
- European Economy. Occasional Papers. 148. May 2013
The Second Economic Adjustment Programme for Greece – Second Review May 2013
http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp148_en.pdf
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Savina Princen, Gilles Mourre, Dario Paternoster and George-Marian Isbasoiu
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European Economy. Economic Papers. 480. April 2013
Katia Berti
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European Economy. Economic Papers. 477. April 2013
Carlos Cuerpo, Inês Drumond, Julia Lendvai, Peter Pontuch and Rafal Raciborski
Indebtedness, Deleveraging Dynamics and Macroeconomic Adjustment
http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp477_en.pdf

4. Other publications

Convergence Report 2013 on Latvia – June 2013

http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee3_en.pdf

European economic forecast - spring 2013 – May 2013

http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee2_en.pdf

Current account surpluses in the EU – December 2012

http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-9_en.pdf

Fiscal Sustainability Report 2012 – December 2012

http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-8_en.pdf

5. Regular publications

Business and Consumer Surveys (harmonised surveys for different sectors of the economies in the European Union (EU) and the applicant countries)

http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm

Business Climate Indicator for the euro area (monthly indicator designed to deliver a clear and early assessment of the cyclical situation)

http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/2013/bci_2013_03_en.pdf

Key indicators for the euro area (presents the most relevant economic statistics concerning the euro area)

http://ec.europa.eu/economy_finance/db_indicators/key_indicators/index_en.htm

Monthly and quarterly notes on the euro-denominated bond markets (looks at the volumes of debt issued, the maturity structures, and the conditions in the market)

http://ec.europa.eu/economy_finance/publications/bond_market/index_en.htm

Price and Cost Competitiveness

http://ec.europa.eu/economy_finance/db_indicators/competitiveness/index_en.htm

Editor-in-Chief: Elena Flores

Overall coordination: Eric Ruscher

Data assistance: Benedetta Guerzoni

Comments on the report would be gratefully received and should be sent to:

Elena Flores
Director – Policy Strategy and Coordination
Directorate-General for Economic and Financial Affairs
Office CHAR 15/66
B-1049 Brussels
Email: elena.flores@ec.europa.eu

or

Eric Ruscher
Head of Unit – Macroeconomy of the euro area
Directorate-General for Economic and Financial Affairs
Office CHAR 15/248
B-1049 Brussels
Email: eric.ruscher@ec.europa.eu

