III. Firms' investment decisions in vulnerable Member States ([32])

This chapter assesses firm-level patterns in investment in vulnerable Member States. The starting point is the observation that the profitability of firms in tradable sectors has recently been restored relative to those in non-tradable sectors, although it remains low in absolute terms. The study shows that tradable sector firms' investment, relative to non-tradables, has not yet responded to improved relative profitability. This development could be problematic, since capital reallocation to tradables is desirable to strengthen these countries' export capacity and to restore their external and internal balances. The analysis further reveals that companies in the tradable sectors of vulnerable Member States invest even less than what these firms' currently weak fundamentals would suggest. A tradable sector firm operating in a vulnerable Member State invests significantly less than a similar firm operating in a non-vulnerable Member State. The results suggest that low current profitability or high indebtedness alone cannot explain this investment pattern and that tight credit supply conditions could be among the factors causing current underinvestment.

The credit-fuelled boom of the early 2000s led in most vulnerable Member States to an excessive flow of productive resources into the non-tradable sector. The economic and financial crisis revealed the unsustainability of the boom-years' growth model and triggered a difficult but necessary rebalancing process. Given the central role attributed in this process to restored competitiveness through internal devaluation, swift reallocation of resources from downsizing non-tradable sectors into tradables is highly desirable. This would in turn contribute to addressing both external and internal imbalances, while reducing the social and economic costs of the adjustment and promoting sustainable medium-term growth.

This section discusses whether the conditions for an increase in investment by firms in the tradable sectors have been met. In particular, it focuses on two pre-requisites, namely (i) the improved expected return on investment in the tradable sector relative to the non-tradable sector, which serves as an incentive mechanism for capital allocation, and (ii) the ability to finance viable investment projects in the tradable sector.

III.1. Profitability and capital allocation

One of the central assumptions of economics is that profitability shapes firms' investment decisions. While in the long run a high equilibrium profit rate, especially if it signals rents related to barriers to entry and market power, could be detrimental to investment and growth, the short-term positive effects of profitability on investment are widely accepted. The debate about the specific mechanism behind this positive relationship has not been closed: possible explanations are that current profitability provides valuable signals about a firm's future demand and profitability prospects, but also that firms' internal funds serve to overcome frictions in financial markets. ([33]) The strength of the response of investment to profitability is likely to change across countries and over periods, as well as following specific shocks such as uncertainty. ([34]) Still, it is likely that relative differences in profitability across sectors in a given country and period represent an important incentive for capital allocation and reallocation decisions.

Improved relative profitability of tradables

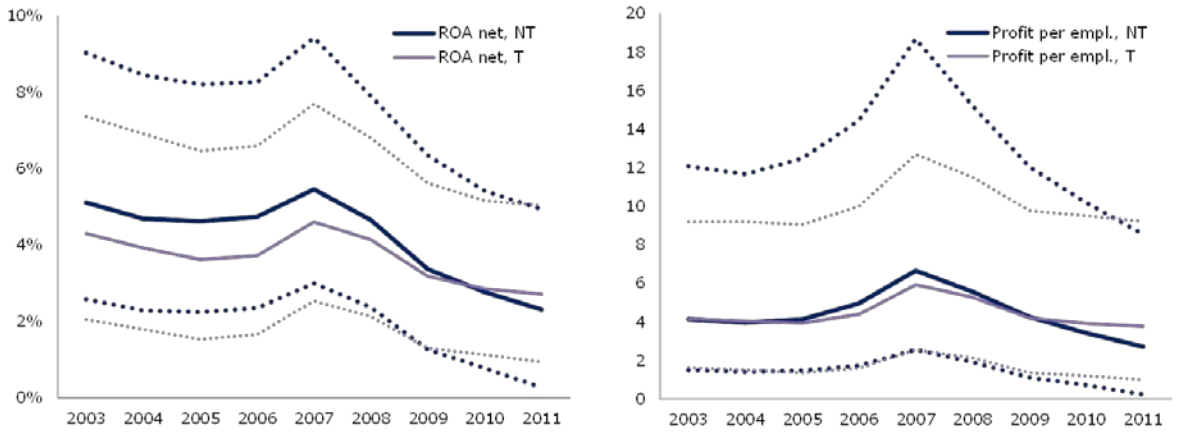
As a result of the rapid credit-fuelled expansion of internal demand in the pre-crisis years, some vulnerable Member States witnessed a shift in profitability in the non-tradable sector above that of tradables. The October 2013 issue of the QREA discussed this asymmetric effect of the pre-crisis expansion on corporate profitability, observed

([32]) Section prepared by Peter Pontuch.

([33]) See a literature overview in Hubbard, R.G. (1998): "Capital-market imperfections and investment", *Journal of Economic Literature*, Vol. 36(1), pp. 193-225.

([34]) The variability across countries is signalled by Mulkay, B., B.H. Hall and J. Mairesse (2000): "Firm level investment and R&D in France and the United States: A comparison", *NBER Working Papers* 8038. The responsiveness of investment to demand and profitability shocks is shown to be reduced in periods of uncertainty by Bloom, N., S. Bond and J. van Reenen (2007): "Uncertainty and Investment Dynamics", *Review of Economic Studies* 74, pp. 391-415.

Graph III.1: **Developments in firm-level profitability of Spanish firms in the tradable (T) and non-tradable (NT) sectors (1) (2)**



(1) Medians (solid line), 1st and 3rd quartiles (dotted) of the distribution of firm profitability. (2) Return on assets (ROA) is measured after tax as earnings before interest/total assets. Profit per employee is measured in thousands of euro as earnings before interest divided by the number of employees.
Source: Orbis, DG ECFIN.

especially in Spain, Greece, and Portugal. ([35]) Focusing on the current adjustment phase, the analysis also stressed the role of the recent limited pass-through of falling wage costs to the price of tradables, helping to restore firms' profit margins. This, together with subdued demand for non-tradable goods (most prominently for real estate-related goods) led to an inversion of the profitability differential in favour of tradable sectors. ([36])

Graph III.1 illustrates these developments using the example of Spanish firms. The left panel shows the distribution of the return on assets, which is a widely used measure of the economic profitability of a firm. The recent inversion of relative profitability in favour of tradables is clearly visible on the bulk of the distribution as given by the medians and the two quartiles. It is worth noting, however, that the absolute level of tradables' profitability decreased following the crisis, owing to the fact that only a part of tradables' output is actually traded. An improvement in profitability levels will therefore depend both on developments in the economic conditions of a country's main trading partners and on stabilisation of domestic demand. Indeed, as domestic economic conditions improve, even non-exporting local firms will be able to reap the benefits of restored competitiveness against foreign imports.

The right panel complements this analysis with a less common measure of profitability, namely profit per employee. This variable represents the return to firm claimholders given a certain level of use of labour resources and is also a proxy for a sector's attractiveness to labour. This variable provides a similar message about the recent inversion in the incentives for resource allocation between these sectors.

The country-specific analysis in the recently published European Commission Product Market Review ([37]) reveals that similar developments in relative profitability were observed recently in Portugal and Slovenia (the latter despite the fact that there was no apparent bias towards non-tradables in the pre-crisis years). No inversion of relative profitability has been observed in Greece. This could be due to (i) the fact that the tradable sector in Greece is effectively much less open than in other Member States, leading to a comparable demand shock affecting both tradables and non-tradables, and/or (ii) to product market imperfections hampering the readjustment process more than in other vulnerable economies.

([35]) See European Commission (2013a): 'Labour costs pass-through, profits and rebalancing in vulnerable member states', *Quarterly Report on the Euro Area*, Vol. 12(3), pp. 19-25, which also provides additional information about the firm-level dataset used.

([36]) A usual definition of tradable sectors is used covering agriculture, mining, manufacturing, energy and utilities, trade, transport, accommodation and food services. The concept of tradability refers to the firm's potential to engage in international trade, rather than to its actual export status.

([37]) See European Commission (2013b): 'Capital reallocation into tradable sectors: incentives and obstacles', *Product Market Review 2013*, pp. 49-72.

Investment response lagging

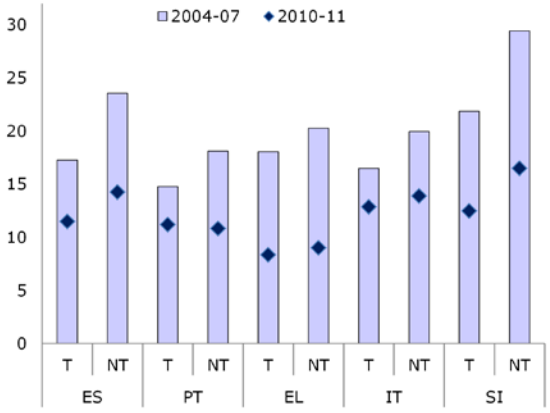
Despite the recent inversion of relative profitability between sectors in vulnerable economies, which is likely to signal relatively higher future returns on investment in tradable sectors, subdued aggregate capital formation does not point to a rise in investment activity driven by tradable sectors. The aggregate figure is, however, significantly affected by the disinvestment in downsizing sectors, most of them non-tradable. Any increased investment activity in specific tradable sectors is not easily detectable in aggregate investment figures.

Firm-level investment data can therefore provide valuable insights, especially by allowing the separation into tradable and non-tradable sectors. Graph III.2 presents the median investment rate for a set of vulnerable economies. The non-tradable sector was investing at a faster pace in the pre-crisis period in most vulnerable Member States. One can see that the difference in investment between non-tradables and tradables was reduced in 2010-11 (2011 being the last annual observation available in the firm-level dataset) in virtually all vulnerable Member States. This partial correction in the relative investment bias was achieved by a strong contraction of non-tradable sector investment. Investment rates in tradable sectors also contracted in the crisis period, although somewhat less sharply. However, the tradables series shows no apparent signs of picking up in absolute terms in the most recent available annual figures. A similar absence of resource reallocation to tradables is signalled by firms' employment and net borrowing rates. ([38]) These observations are in contrast with post-crisis developments in the non-vulnerable Member States (Germany in particular, but also France and Finland), where tradable investment rates contracted in 2008 but recovered in subsequent years.

In summary, the recent inversion of relative profitability between tradables and non-tradables is a move in the right direction. The change is likely to signal better future investment returns in tradable sectors in relative terms and, over the medium term, possibly in absolute terms as well, providing an incentive to reallocate resources to tradables. This development is in line with the rebalancing needed, as it corrects the pre-crisis bias which fostered capital to flow predominantly into non-tradable sectors. However, the correction of private incentives to invest has not yet prompted a clear reallocation of resources. One of the possible explanations for this absence of response could be that despite a relative improvement in tradable sectors' prospects vis-à-vis the non-tradable sector, tight credit supply hinders this reallocation. An alternative, credit-demand-driven explanation would be that low investment in tradables merely reflects the fact that company fundamentals are still weak (e.g. profitability is depressed in absolute terms due to firms' reliance on the domestic market or high indebtedness) or that policy uncertainty persists. The next sections attempt to disentangle these alternative explanations.

Graph III.2: **Investment rates in vulnerable Member States (1), (2)**

(2004-2011, % of fixed assets)



(1) The figure presents median gross investment rates, defined as the change of fixed capital between year t and t-1 plus estimated accounting depreciation divided by previous year's fixed assets. (2) T denotes tradable industries, NT non-tradable industries.
Source: Orbis, DG ECFIN.

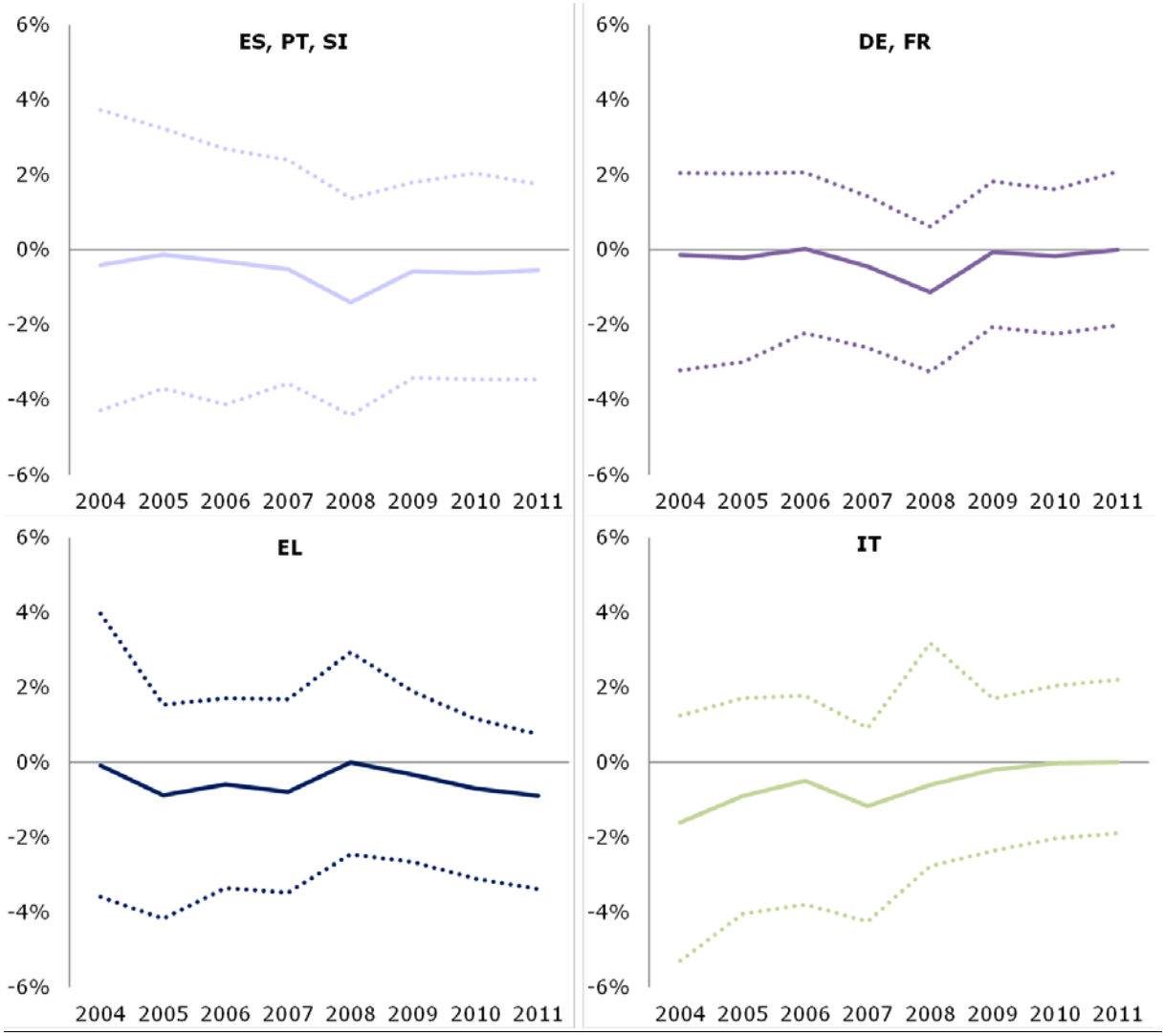
III.2. Tradable sector investment and company fundamentals

The analysis in this section relates tradable sector firms' investment to their fundamentals using an empirical investment equation. The investment equation allows one to construct a predicted investment rate that takes into account individual firm characteristics and health, as well as aggregate conditions affecting all firms within an industry across all countries. These predicted investment rates can then be compared with the actual rates to construct an investment gap (this variable of interest corresponds to the investment equation

([38]) See country-specific analysis of investment, employment and net borrowing rates in European Commission (2013b).

Graph III.3: **Gap between tradable sector firms' actual and expected investment**

(2004-2011, % of total assets)



(1) Medians (solid line), 1st and 3rd quartiles (dotted) of the distribution of the investment gap. (2) A negative value for the investment gap corresponds to underinvestment compared to what the investment equation would predict.

Source: Orbis, DG ECFIN.

residual). If a firm has a positive investment gap, its actual investment is higher than the rate the model would predict. Conversely, a negative investment gap signals that a company is underinvesting compared to what the fundamentals-based model would suggest.

The investment equation models the firm-level net investment rate ([39]) as a function of lagged company variables. The first two variables are profitability (measured by the return on assets, i.e. the company's profitability before financing costs) and sales growth, which are commonly used as signals of future demand prospects. The specification also includes size (the logarithm of total assets) and capital intensity (the ratio of fixed assets to total assets) to capture likely differences in investment related to firm scale, and the level of existing fixed capital, and financial leverage (non-current liabilities divided by the sum of non-current liabilities and equity). A firm fixed effect is included to control for unexplained heterogeneity among firms related to time-invariant characteristics. Aggregate conditions affecting all firms within an industry are taken into account by

([39]) Net investment is measured by the annual increase in fixed assets and therefore considers not only new investment flows, but also their depreciation, write-downs, disposals, and other changes in the stock.

introducing year×industry dummy variables. ([40]) The idea is to take into account the state of a given industry (e.g., current and expected future demand, technological changes, price of intermediate inputs, etc.) at EU level. The model is estimated on annual data covering the period 2003-2011 for several vulnerable and non-vulnerable Member States.

A cross-country comparison is presented in graph III.3, showing the annual median, lower and upper quartiles of tradable sector firms' estimated investment gap. The top left panel bundles three vulnerable economies with similar individual patterns in investment gaps, namely Spain, Portugal, and Slovenia. The gaps appear distributed almost symmetrically around zero in pre-crisis years, then drop below zero at the onset of the financial crisis in 2008. In subsequent years, the investment gap does not fully recover and remains in negative territory, suggesting that tradable sector firms in these countries possibly are underinvesting as of 2011. The top right panel, bundling France and Germany, shows a similar symmetric distribution in pre-crisis years followed by a drop in 2008. Unlike vulnerable Member States, however, subsequent years show a swift recovery back to a symmetrical distribution around zero.

The bottom panels of graph III.3 show two specific cases. On the left, the figure for Greece suggests that some underinvestment in tradables occurred even in pre-crisis years, with a brief normalisation in 2008 followed by further underinvestment in the crisis period. Italy, in the bottom-right panel, also has a specific position among vulnerable Member States. The Italian tradable sector appears to have underinvested for most of the early 2000s, which is consistent with the deterioration of the Italian trade balance in the first decade of the twenty-first century. As the crisis hits, the median investment gap moves upwards and is close to zero as of 2011. However, this development is not driven by an increase in investment, which would be the favourable case, but rather by a reduction in the predicted investment driven by deterioration in firm fundamentals.

The analysis using an investment equation seems to suggest that recent tradable sector investment in several vulnerable Member States is lower not only in absolute terms, as signalled in the previous section, but also after controlling for company fundamentals. Similar findings are obtained if one looks into the average difference between investment rates of firms with comparable fundamentals operating in vulnerable and non-vulnerable Member States. ([41]) The last section discusses whether this underinvestment can be at least partially related to current financing difficulties.

III.3. Funding problems as a factor in underinvestment in tradables

One of the possible interpretations of the above results is that companies in tradable industries in vulnerable Member States underinvest because of a lack of access to finance, a phenomenon often referred to as the credit supply channel effect. Financing difficulties can either take the form of excessive financing costs, or be related to quantity rationing (a situation where lenders would purposely not satisfy all credit demand at prevailing market lending rates). In both cases, the implications would be that firms are forced to forgo some economically viable investments, thereby trimming their prospects of future performance. Besides the microeconomic consequences, underinvestment imposed by financing difficulties would also have serious effects at aggregate level, postponing readjustment of the productive sector as part of broader rebalancing in vulnerable economies and reducing medium-term potential growth. Note, however, that other factors could also be responsible for the recent underinvestment. For example, vulnerable Member States' companies could simply have been very cautious with respect to debt financing since the onset of the crisis. Another explanation could be that the underinvestment is related to an unfavourable economic outlook, and the concomitant uncertainty. ([42])

In order to inspect the role of access to finance in the investment patterns observed as of 2011 this section uses a synthetic measure of financing difficulties based on the survey on the access to finance of SMEs (SAFE). The SAFE is a half-year

([40]) Industries are defined at the 2-digit level of the NACE rev. 2 classification.

([41]) See the analysis using a matching estimator in European Commission (2013b).

([42]) The effects of uncertainty on investment are discussed by Bloom et al. (2007) and in European Commission (2013c), 'Focus: Assessing the impact of uncertainty on consumption and investment', *Quarterly Report on the Euro Area*, Vol. 12(2), pp. 7-16.

survey jointly organised by the European Commission and the European Central Bank focusing on European firms' recent experience with raising external funds. ([43]) These survey data also have drawbacks, notably the fact that they rely on perceptions that may be biased in periods of stress, and that they do not fully control for the quality of loan applications.

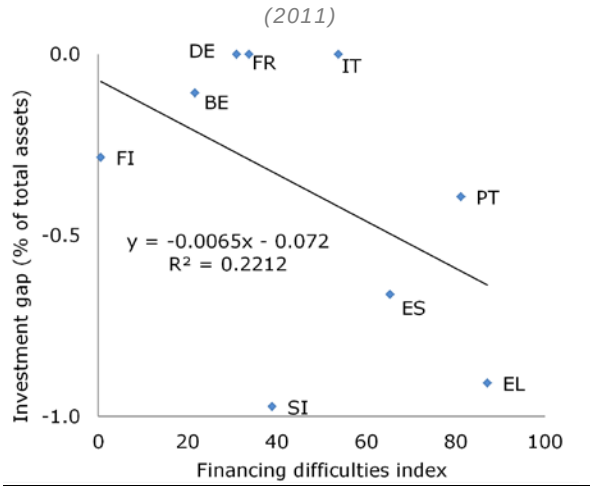
The SAFE 2011H1 data are used to construct an estimated probability for a given firm of facing financing difficulties in 2011, which is the last annual observation in the firm-level dataset. More specifically, a probit model is used to estimate the probability of a loan request failure, defined as an event where the firm does not receive at least most of the amount requested, in line with Holton et al. (2012). The explanatory variables in the probit model are the sector of activity, the firm's size, age, recent evolution of net income, and a set of country fixed effects to control for aggregate effects, such as banking sector strength or overall economic outlook. Large firms are excluded from the analysis, as some of their variables are not available in the SAFE dataset for confidentiality reasons.

The estimated model parameters are then used to construct a synthetic probability of loan rejection in the large firm dataset used at the investment equation stage. An indirect approach to modelling the likelihood of financing difficulties is necessary, as it is impossible to link the SAFE micro-data with the firm-level dataset, owing to confidentiality restrictions. This estimated probability of loan rejection, representing a measure of financing difficulties, is related to the investment gap in Graph III.4. The figure suggests that the financing difficulties of the median firm have a statistically significant negative relationship with the observed median investment gap. This preliminary graphical analysis would imply, subject to the caveat that other relevant variables are not taken into account, that tradable sector firms' underinvestment is at least partly driven by tight credit supply.

The most notable elements omitted at this stage of the analysis include the demand outlook, and the general economic and policy uncertainty, which was high in some Member States in 2011. ([44]) The economic outlook obviously affects tradable firms' investment behaviour, as it is a major driver of future demand developments. Uncertainty is also expected to have a negative effect on investment, since it increases the option value of investment projects, which may lead to their postponement (Bloom et al., 2007).

A more thorough analysis of the investment gap at firm level, controlling for alternative proxies of financing constraints (size and age), for the expected firm profitability over the next three years implied by the macroeconomic outlook in the European Commission's 2011 Spring forecast (considered as reflecting official macroeconomic expectations as of 2011), and for overall country-level heterogeneities (which therefore also capture uncertainty regarding the macro outlook) confirms the preliminary results as regards the significant relationship between financing constraints and underinvestment. ([45])

Graph III.4: **Financing difficulties and the investment gap (1)**



(1) Median measure of financing difficulties obtained from an estimated probit model using SAFE data and median investment gap (a negative value is underinvestment).
Source: Orbis, DG ECFIN.

The analysis does not exclude the possibility that demand-related factors were also at play in the underinvestment observed in 2011 (e.g., vulnerable

([43]) For more details about the survey and for similar analysis of these data, see Holton, S., M. Lawless and F. McCann (2013): 'SME financing conditions in Europe: credit crunch or fundamentals?', *National Institute Economic Review*, Vol. 225(1), pp. R52-R67, and European Commission (2013d): 'Perceived access to bank loans for EU firms in times of crisis', *Product Market Review 2013*, pp. 94-110.

([44]) The very bad economic conditions prevailing in 2011 may also have led to a temporary undershooting of demand expectations that would be reflected in even lower investment.

([45]) For the detailed analysis see European Commission (2013b).

Member States firms' higher reluctance to take on debt in the current context, higher pessimism with respect to future economic conditions compared to official forecasts and corresponding uncertainty, or other frictions such as those affecting the labour market). Similarly, some of the correlation between firm underinvestment and the loan rejection probability may also reflect genuine differences in individual firms' risks that justify some of the loan rejections. Still, the above findings seem to point to the fact that inadequate financing could be among the binding constraints of the current resource reallocation process.

III.4. Concluding remarks

This chapter presents firm-level evidence that tradable sectors' relative investment has so far only partially responded to recent improvement in relative profitability compared to the non-tradable sector. The analysis shows that the low investment rates are even below what would be justified by currently weak firm-level fundamentals, controlling *inter alia* for firm indebtedness. Stated differently, two similarly performing companies, of similar size and indebtedness, operating in the same tradable industry, invest significantly differently if one is based in a vulnerable Member State and the other is not. The conditions at country level are therefore a significant determinant of current firm-level investment, in addition to firms' fundamentals.

Several alternative factors could explain the observed underinvestment in vulnerable economies. The analysis suggests that tight credit supply conditions are a statistically and economically significant predictor of underinvestment in tradables, after controlling for different expected profitability developments over the next three years, and for country-specific effects (e.g., covering aggregate uncertainty). Although the non-tradable sector is likely to face the same degree of financing difficulties, its general need to disinvest in the wake of the economic crisis makes the financing constraint somewhat less binding. ([46])

The results suggest that tight credit conditions possibly are among the factors that make the current rebalancing in vulnerable countries more protracted and more painful. Policies should focus on restoring lending to economically sound firms with viable investment projects, particularly in those vulnerable Member States where fragile banks exert a high level of conservatism on SME lending. Once lending to viable parts of the economy is restored, other measures such as re-aligned tax incentives (see next chapter) could further stimulate corporate investment activity in tradable industries.

([46]) See for example the discussion in Box I.2. in European Commission (2013e): 'European Economic Forecast, autumn 2013', European Economy 7/2013.