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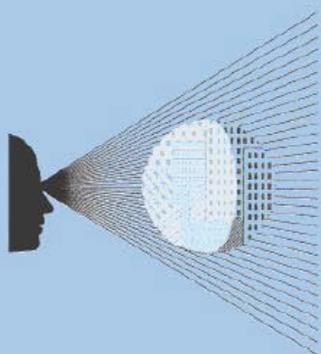
Oxera

Should aid be granted to firms in difficulty?

A study on counterfactual scenarios to restructuring state aid

**Prepared for the
European Commission**

December 2009



COMPETITION REPORTS

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Executive summary

Objective, motivation and remit

The objective of this study is to investigate cases of large and medium-sized European firms that have experienced financial difficulty or financial distress. In this context, financial difficulty, or distress, is broadly defined by financial performance criteria which constitute a set of necessary, but not sufficient, conditions that qualify failing firms for the application for approval of restructuring aid.

The purpose of this investigation is to inform the European Commission what might happen to a firm seeking approval of restructuring aid in the absence of such aid. This is referred to as the 'counterfactual scenario' to state aid being received. Every year, a large number of firms in the European Union experience financial difficulties, and these can provide information about such counterfactual scenarios. In contrast to the counterfactual, there are relatively few factual cases where restructuring aid has been granted. For example, from 1995 to 2003, the Commission made 86 decisions to approve rescue and restructuring aid granted to 79 firms from 10 EU Member States.¹ Nearly half of these cases involved firms in the manufacturing industry, a third of which went bankrupt after receiving aid; a majority involved state-owned firms.²

These cases reflect the Commission's requirement that state aid must be tightly controlled, and should be allowed only in circumstances where it can be demonstrated that it does not act against the Community interest. On the one hand, state aid can help remedy market failures and reduce inequalities; on the other hand, it also brings costs through the related taxes and potential distortions of competition. Until now, there has been a policy presumption that the provision of restructuring aid saves a 'considerable amount of jobs and activities which would otherwise disappear', but less concrete evidence or quantification of these effects.³

The Commission recognises that it might not have always had sufficient evidence to make its decisions as informed as possible. Similarly, the evidence for the Commission to understand the aggregate impacts of state aid intervention on jobs and activity, in comparison to a counterfactual of no intervention, may have been limited.

This study examines the impact of financial difficulty and distress on firms' output and employment, as well as their potential broader consequences at the industry and regional level, to inform what might happen in the absence of state aid. The Commission might also use the results of this study to inform the decision criteria for approving restructuring aid; however, this study does not consider justifications for state aid beyond the impact of distress on employment and activity.

Recent developments in financial markets, the global financial turmoil, the economic downturn and the associated state interventions to minimise systemic risk render the objectives of this study particularly relevant, while highlighting the importance of informed and measured considerations of state involvement in the private sector. This study does not, however, incorporate analysis of firms that have recently been experiencing financial difficulty since the long-term outcomes of these cases are unknown at this stage.

¹ See Glowicka (2008), p. 28.

² State-owned firms are defined as those where the state controls more than 50% of the capital. See Glowicka (2008), p. 29.

³ European Commission (2008b).

Methodology and analytical approach

To understand the outcomes of financial difficulty requires a thorough assessment of the process of distress and restructuring. This process has considerable implications for outcomes of distress at the firm, regional and industry level. The study therefore begins by describing the key aspects of the process of distress.

The empirical analysis of financial distress focuses on firms for which the outcomes of distress are known. These outcomes, in terms of changes in output and employment at the firm and regional level, are determined by a variety of factors, such as firm and sector characteristics, business and financial performance prior to distress, the size of any shocks (and hence the severity of the consequent distress), contemporaneous market conditions and labour market characteristics.

Using economic analysis, the study identifies such factors based on past information and makes practical recommendations that might be helpful in constructing the counterfactual scenarios, given the information that might be available at the time of the decision. This is important because the application of findings from empirical research in this case is not straightforward. The study therefore provides illustrations of how such findings can be used in practice.

In addition to examining the determinants of the final outcomes, the analysis tests the relationship between firm characteristics prior to distress and survival rates, which indicate the likelihood that firm-level employment and output will not fall to zero. While the analysis is conducted without preconceived views as to what are the significant factors affecting outcomes of distress, three broad sets of factors are explored.

The first set of factors relates to firm characteristics. These include the firm's size (relative to the region and the industry, for example, in terms of output), its financial structure, its capital intensity and particular characteristics of its employees. For example, if a firm is an important component of a sector characterised by a strong relationship between upstream and downstream firms, its distress could harm other firms operating at different stages in the value chain, with financial distress then propagating through externalities between firms.

The second set of factors relates to sector characteristics, such as the relevance of the sector to the regional economy, the degree of import penetration (and, more specifically, any increase in international competition), capacity utilisation and industry profitability.

The final category includes labour market characteristics, such as the 'tightness' of the local and national labour market and the flexibility of local labour institutions.

The formulation of the hypotheses based on these considerations is informed by the findings from past research. To test the relevant hypotheses, the study adopts a three-tier approach.

- The first tier consists of a statistical analysis carried out on a European-wide sample of firms in difficulty. The analysis considers the relationship between post-distress output and employment at the firm level and financial and business performance prior to distress.
- In the second tier, a more focused analysis is carried out on selected case studies, which are particularly informative for analysing the process and outcomes of distress, as well as providing information about factors that might be relevant in specific state aid cases. These case studies explore in greater depth the evolution of the activity of firms in distress, highlighting factors that might be important in developing counterfactual scenarios.
- The third tier is a review of existing research on the causes and outcomes of distress in order to achieve a well-informed understanding of the available information and insight

about the consequences of financial distress. This draws on previous studies and consolidates findings from different forms of research in order to present a more holistic picture of the consequences of distress.

The results are cross-checked through targeted interviews with market practitioners (in particular, insolvency practitioners and bankruptcy lawyers). These interviews also provide information on the process of bankruptcy and restructuring in different jurisdictions to gain a greater understanding of their legal and market framework.

Firm performance leading to financial difficulty and distress

The results of empirical research begin with the evolution of a firm's performance prior to distress. For a typical firm in the sample experiencing distress, employment increases significantly and revenues increase slightly prior to distress, which might be indicative of a period of expansion of the firm's activities in the period leading to distress. For example, the empirical analysis finds that in the year prior to the onset of distress, employment increases by 22% and revenues by 8% on average compared with the three years prior to distress.

A firm's financial health shows evidence of persistent deterioration prior to distress, culminating in a sharp decline in the firm's financial position, as reflected in changes in a number of financial ratios in the year prior to distress. While profitability ratios show a general decline over the three years prior to distress, the decline is particularly large in the year of distress.

The observed combination of increasing employment and declining business performance indicates that distressed firms expand into less profitable activities, or invest in less profitable projects. This would suggest that important drivers of distress are often inappropriate investment decisions or mismanagement.

In some cases, these difficulties appear to have been associated with sector-level effects. While all firms exhibit a pronounced deterioration in financial performance in the years prior to distress, the empirical analysis finds, for example, that the manufacturing sector displays a more pronounced deterioration.

The more in-depth analysis of selected case studies suggests that the operating losses of firms experiencing financial difficulties can originate from market developments that have not been properly addressed by the firm. While some factors, such as stock market crashes or sector-specific shocks, might be beyond management control, the case studies show that the response of management is a significant factor that can either mitigate or exacerbate the negative external effects of these factors for the firm in question.

The empirical analysis also indicates that declining business performance leads to a marked deterioration in a firm's ability to service debt obligations in the year prior to distress, due in part to deterioration in profitability and in part to increases in leverage. The latter is typically the result of increased draw-downs on existing facilities or the opening of new lines of credit in response to cash shortfalls. This is particularly problematic for firms with a high level of debt, which are less able to respond to changes in market conditions.

In many of the cases investigated, distress was associated with an aggressive financial structure adopted prior to the distress. The distress appears to be more severe for those firms that are more highly geared, suggesting that such firms would be more likely to reduce output to a greater extent following the onset of difficulties.

Impact on a firm's survival

The empirical analysis of outcomes following distress starts by considering a proportion of firms that cease to be active, because they have either been liquidated or acquired by other companies and have ceased to exist as an independent legal entity.

The average survival rate of firms three years after the onset of distress is around 77%, but there is significant variation in survival rates across Member States and sectors. This may be explained by a number of factors, including institutional differences such as variations in Member States' insolvency legislation and the flexibility of labour market legislation.

Firms growing faster prior to distress are more likely to survive financial difficulty, while those firms whose financial performance has declined substantially over the years prior to the onset of distress are less likely to survive post-distress. Firms that have experienced more severe financial distress (ie, which are in a very difficult financial position at the point of distress) are less likely to survive post-distress.

The empirical relationship between a firm's performance prior to and at distress and its survival rate is weaker over the longer term. This suggests that longer-term survival depends to a greater extent on contemporaneous business factors and market conditions in which firms find themselves over several years after distress than on historical performance and drivers of distress.

Higher financial leverage at the time of the distress is an important factor associated with lower survival rates, which is likely to be due to highly geared firms having less financial 'headroom' to respond to any adverse shocks. The impact of higher financial leverage is, however, a weaker determinant of survival in the longer term, which is consistent with the hypothesis that, if a firm survives the initial post-distress period, its long-term performance is more independent of the initial financial structure.

Previous studies also show that financial structure is a significant determinant of survival rates. For example, if a firm's debt structure is made up of a smaller number of securities, the costs of distress are found to be lower than for firms with more complex financial structures.

In addition to financial structure, creditor structure has been found to be a significant factor affecting outcomes of distress. Past research has found that firms with a greater proportion of bank debt in their capital structure are more likely to avoid entering formal bankruptcy proceedings. If these firms experience difficulties, the indirect costs of bankruptcy have been found to be lower.

The empirical analysis and existing studies find that the likelihood of surviving financial distress is substantially lower for manufacturing firms. However, there is evidence from the empirical analysis to suggest that larger firms are more likely to survive.

The case studies also provide insight into the determinants of certain firms' survival rates. For example, with respect to the form of firm survival, some case studies suggest that more 'stand-alone' parts of a larger business might be easier to sell or restructure, and in doing so preserve output and employment for at least some parts of the business.

Past research can inform on other intermediate outcomes. For example, recovery rates (ie, the amount recouped by creditors through insolvency proceedings) have been found to be lower for firms with higher financial leverage. This suggests that these firms would be more likely to reduce output in response to distress, although the latter inference does not appear to have been examined directly by existing empirical studies. Recovery rates have also been found to be lower among those distressed firms that have a greater proportion of specific assets. There is also some indication that, in concentrated industries, firms may take advantage of the onset of distress by adopting predatory strategies in an attempt to gain market share from the distressed firm.

Finally, both case studies and prior research indicate that an efficient insolvency process with effective administration might help to ensure more positive outcomes of distress. For example, the impact of distress on survival appears to vary according to the insolvency regime, with survival rates being higher for firms operating under the UK and Nordic insolvency regimes than under the French or German legal origins.

Impact on output and employment

The empirical analysis indicates that, following the onset of distress, surviving firms tend to reduce employment. In contrast, revenues typically recover by the third year following distress after a relatively small decline in the year of distress. Five years after the onset of distress, revenues are around 30% higher than the year prior to distress, while employment is around 3% lower over the same period. The recovery of revenues during a period of falling employment suggests that firms in distress commence a series of restructuring initiatives aimed at increasing productivity and efficiency in response to financial difficulties.

Despite a relatively quick recovery in revenues after the onset of distress, the financial health of distressed companies remains poor and does not recover to pre-distress levels even five years after the onset of distress. However, there are a number of important differences by sector. For instance, manufacturing firms do not tend to achieve a significant recovery, while firms operating in construction and wholesale trade appear to achieve a partial recovery on the basis of various financial measures.

Firms' performance prior to the onset of distress has a significant impact on changes in output (as measured for surviving firms) following distress. Those firms whose revenues have been growing faster prior to distress experience a greater reduction in revenues following the onset of distress. For example, on average, firms that experience a 10% increase in revenues prior to distress are associated with a 10–14% contraction in revenues in the year following distress. This suggests that firms that experience the most severe financial distress may have over-expanded in the period leading up to the onset of distress.

The analysis also indicates that financial leverage increases considerably in the year immediately before the onset of distress and, on average, across three years following distress, suggesting that distressed firms do not return quickly to financial solvency. Higher financial leverage prior to distress is significantly associated with revenue outcomes following distress, as in the case of survival rates.

Consistent with findings on the drivers of survivability outcomes, greater severity of distress is associated with poorer revenue and employment outcomes. That is, revenues and employment of the most severely distressed firms will fall by more than for other distressed firms. Furthermore, outcomes post-distress are influenced by firms' performance prior to the onset of distress. For example, on average, across the empirical sample, a 10% reduction in earnings before interest and tax relative to assets between the year prior to distress and the year of distress is associated with a 5% reduction in revenues post-distress.

An examination of existing empirical studies has also revealed that, as the severity of distress increases, output typically falls. In response to this, firms tend to reduce their capital investment in order to mitigate the impact of financial distress. If firms resolve their difficulties, existing empirical studies suggest that customers return only slowly to firms that have experienced the most severe distress.

In terms of firm characteristics, larger firms' revenues and employment tend to grow more slowly following the onset of distress. For example, employment for the largest firms grows 17–20% more slowly when compared with the smaller firms in the year following distress and 36% lower in the three years following distress. This is partly driven by faster growth rates of small firms in general, but is also due to greater difficulties in restructuring larger firms. Manufacturing firms experience poorer revenue and employment outcomes relative to firms operating in other sectors.

There is strong evidence from the empirical analysis that firms typically reduce employment following the onset of financial distress. Existing empirical studies suggest that firms initially reduce their reliance on temporary workers before considering changes to permanent staffing levels. Severity of distress is an important factor in this context and has a significant

impact on reductions in employment in the year following distress, suggesting that more severe distress necessitates a deeper restructuring of employment.

At the same time, financial leverage is not significantly associated with employment outcomes following distress, although there is a significant relationship with revenue outcomes. Manufacturing firms experience poorer employment outcomes relative to firms operating in other sectors.

Analysis of past research indicates that employment and output outcomes following the onset of distress are more positive for those firms with good access to either capital markets or private capital, as well as for those firms whose assets can be more easily transferred to alternative uses. Furthermore, outcomes are more positive for firms that operate in less highly concentrated sectors. As noted above, in more highly concentrated sectors, rival firms might have a greater incentive to pursue predatory output strategies when a firm in the same industry experiences financial distress.

Existing empirical studies also suggest that job losses at the firm level are influenced by the characteristics of the employees themselves. Employees who are older, less educated or work in manual occupations are more likely to be displaced following the onset of difficulties at the firm level. Moreover, existing studies indicate that the extent to which distressed firms reduce their workforce in response to the onset of difficulties also depends to a large degree on the flexibility of labour market legislation.

In addition, case studies highlight that market or legal factors play a significant role in determining outcomes. Market factors associated with industry-level developments can significantly affect a firm's performance following distress. In addition, the cases reviewed suggest that an efficient insolvency process would help ensure more positive outcomes of distress.

Impact at the industry and regional level

Regional and industry effects are critical aspects of the analysis. In certain cases, jobs and output at a distressed firm might switch to competitors, minimising the net impact of distress; in other cases, wider employment and output might be lost due to the impact of a firm's distress on its customers and suppliers.

Tracing the impact of distress on the activity of competitors in the short and medium term, on the evolution of the workforce in the sector concerned, and on the duration of the negative effects on employment is challenging. As such, the analysis of available data focuses on outcomes at both the region and the industry level. Overall, this analysis indicates that there is an economic relationship between firm performance and regional industry performance.

Prior to the onset of distress, industries with distressed establishments tend to perform less well than the economy. However, following distress, there is no noticeable underperformance in industries with distressed establishments compared with national trends. In other words, firm distress often appears to be a consequence of difficulties in the sector rather than a trigger of sector underperformance.

The empirical analysis has not found any wider effects of distress on output, which suggests that the impact of financial distress on regional and industry output cannot be separately distinguished from wider economic trends based on available data. However, in practice, it might be expected that redundancies at distressed establishments would lead to wider negative impacts on output.

A number of previous empirical studies have examined the drivers of wider effects on output, and have found that these largely depend on firms' characteristics as well as industry structure. For example, larger bankruptcies have been found to lead to greater contagion across firms and suppliers, the transmission of financial distress between firms has been

found to increase with the level of product specialisation, and existing empirical studies have also found that the effect on the region or industry will be greater if suppliers have fewer opportunities to switch customers. The empirical analysis finds that redundancies at distressed establishments are associated with declines in employment within the regions and industries in which the establishments are located. Following redundancies, the reduction in employment in the same industries and regions is typically greater than redundancies at the distressed establishments. This suggests that displaced workers experience difficulties finding alternative work in the same industry in the affected region.

These wider effects are reinforced in regions and industries where there is spare capacity. The empirical results suggest that if there is higher spare capacity in the industry, regional employment may fall by more than the redundancies at distressed establishments. This suggests that displaced workers may face greater difficulties finding re-employment if demand conditions are relatively unfavourable.

The effects of redundancies are also reinforced if distressed establishments are part of industries characterised by low labour productivity, which may be indicative of relatively low capital intensity. To the extent that low productivity is also related to relatively low skill levels, this might indicate that the skills of employees in such industries are less readily transferable to alternative employment opportunities.

The analysis of selected case studies has found that the effects of redundancies at distressed firms are felt more intensely within the distressed establishments' immediate industry and region. This may be a result of displaced workers being able to find alternative employment in other industries. Furthermore, following redundancies at an establishment, the proportion of workers taking early retirement was found to increase.

Existing empirical studies have reported that regional outcomes may be magnified if the distressed establishment employs a large proportion of the total workforce in a particular region. The effects of firms' difficulties may be magnified due to spillover effects across the supply chain. To an extent, this will depend on the nature of competition with the industry containing the distressed establishments. Existing studies find that the impact on the region or industry will be greater if there are clusters of distressed firms and, as noted above, if suppliers have fewer opportunities to switch customers.

In the case studies examined, local unemployment was found not to be greatly affected by the consequences of distress at an establishment. This may be a result of employees being able to find work in other industries within the region, or because they exit the workforce, for example through early retirement.

Past empirical research also suggests that a significant proportion of displaced workers are still unemployed three years after losing their jobs. The ease with which these workers are able to find alternative employment appears to depend more on the characteristics of the employees, such as their skill levels, and features of the regional labour market, such as the degree of unemployment in the local region, than on firm- or sector-specific characteristics.

Practical application of empirical findings in the state aid context

The balance between the analysis of specific information that may be available in a given case and the general observations from past cases, which may be informative in terms of how firms in such circumstances typically behave, is particularly important in the context of the application of the findings from this study. The information derived from the economic analysis of past cases may be more or less applicable to the analysis of counterfactual scenarios, depending on the nature of the particular case under consideration.

Since each case is different, the particular challenge of this project is to provide insight into not only what information about counterfactual scenarios can be deduced from the past cases, but also to what extent and how that information can be usefully mapped onto the

specific information that may be available to the Commission in future cases. The challenge in the application of the conclusions of this project would then be to avoid giving insufficient weight to case-specific information by mechanically applying findings from past cases.

In practice, the findings from this study can be used to inform the following framework:

- the information set that the Commission may require on a case in order to inform the counterfactual for jobs and activities;
- economic relationships that may be expected between what the Commission can observe ex ante and the expected outcome for jobs and activity in the counterfactual of no aid;
- applying these relationships to the information set of the case could create a presumption for the Commission on the counterfactual—a presumption that might still be overturned by the specific features of each case. The same process may also assist the Commission in screening cases to prioritise those where the spillover effects of distress on jobs and activity tend to be greater;
- where, using this framework, the facts of the case suggest that the impact on jobs and activity in the counterfactual would be limited, the Commission may wish to require the Member State to provide further evidence to demonstrate why there would be a significant effect.

In practice, the Commission may not always face the full task of constructing the counterfactual. It may be more likely that Member States would present most of the relevant information, and the decision with regard to the aid approval may be a choice between two or more potential aid beneficiaries. In these cases, the benefit of the Oxera report could be to inform the relevant economic considerations for selected dimensions along which the potential aid beneficiaries actually differ. In such cases, the focus may be less on completing the information set relevant to survival or firm output and employment, but rather on just a few key variables associated with, for example, spillover effects.

Even in cases where the key variables cannot be isolated, it would not be appropriate to collect all the information set and then generate mechanistic predictions. Rather, the suggested methodology is to use the information set as a baseline for the counterfactual. The next step would be to look at the specific features of the case and decide where the most important relationships are located for that particular case. This could mean focusing, for example, on the severity of distress or the degree of asset substitutability.

Overall, the application of the findings from this study could generate a rebuttable presumption on the counterfactual, while the particular circumstances of each case would need to be examined and compared with the general relationships set out in the Oxera results.

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1 Introduction

1.1 Background to Oxera's study

During a special meeting in Lisbon in March 2000, the European Council agreed on a new strategy to 'strengthen employment, economic reform and social cohesion as part of a knowledge-based economy'. The Council declared that, as part of this strategy, there was a need to reduce the general level of state aid and to put it to better use to promote competition. It therefore proposed:

shifting the emphasis from supporting individual companies or sectors towards tackling horizontal objectives of Community interest, such as employment, regional development, environment and training or research.⁴

This recognises that state aid to companies may be inefficient (eg, because it distorts competition) and that governments can make better use of these funds.

Since 1957, the EC Treaty has promoted a level playing field by prohibiting any aid granted by a Member State that distorts competition by favouring certain firms. However, exceptions are allowed under the Treaty if the proposed aid has a positive impact and is an effective tool for achieving objectives of common interest:

State aid measures ... can correct market failures, thereby improving the functioning of markets and enhancing European competitiveness. They can also help promote e.g. social and regional cohesion, sustainable development and cultural diversity, irrespective of the correction of market failures.⁵

More recently, the European Commission's 'State Aid Action Plan' makes clear that the state aid policy needs to respond to the new challenges in a number of ways, including by increasing the role of economic analysis in state aid cases:⁶

To best contribute to the re-launched Lisbon Strategy for growth and jobs, the Commission will, when relevant, strengthen its economic approach to State aid analysis.

Making more use of a refined economic approach is a means to ensure a proper and more transparent evaluation of the distortions to competition and trade associated with State aid measures.

This approach can also help investigate the reasons why the market by itself does not deliver the desired objectives of common interest and in consequence evaluate the benefits of State aid measures in reaching these objectives.

The Action Plan suggests that economic analysis should be used in the context of particular decisions in order to evaluate better whether state aid can be justified, is acceptable and represents the most appropriate solution.

Related to these developments, on behalf of DG Enterprise and Industry, in 2007 Oxera developed an economic framework for assessing state aid proposals in the field of innovation.⁷ Criteria and indicators were developed that allow the ex ante identification of

⁴ European Council (2000).

⁵ European Commission (2005).

⁶ Ibid.

⁷ For further details, see Oxera (2007).

when a potentially innovative investment or scheme put forward by a Member State is a priori unlikely to take place in the absence of government intervention due to the existence of market failures.

Following on the strategic objectives set out in the Action Plan, this report, commissioned in December 2008 by the Directorate General for Competition, is intended to help the Commission to increase the role of economics in rescue and restructuring (R&R) state aid cases, and to provide practical guidelines, based on robust empirical evidence, business practice and economic theory, to inform decisions in state aid cases.⁸

The importance of the role of economic theory is highlighted in the Commission's May 2009 staff working paper on the principles for an economic assessment under Article 87.3.⁹ This report provides details and clarifications on the methodology used for the balancing test.

On restructuring aid, the Commission notes that 'aid for rescue and restructuring may be pursued to avoid losses of employment and activity in a location or sector.'¹⁰ To some extent the paper foreshadows some of the messages of Oxera's study, by stating that 'equity justifications may be demonstrated by statistical indicators ... These may include GDP per capita, unemployment levels, participation rates in the labour market'.¹¹

The working paper also emphasises the counterfactual: 'in order to assess the impact of the aid, the Commission must identify a counterfactual scenario with which the situation in which the aid is given can be compared'.¹²

Related to this, the European Commission's decisions on state aid need to take into account both the costs as well as the benefits.

On the benefits side, state aid can help remedy market failures and reduce inequalities, as well as maintaining activity and jobs in the firm and region. Quantifying these potential benefits against robust, informed scenarios on the counterfactuals to state aid (ie, scenarios on what are the potential consequences of non-approval of state aid) is critical for assessing the appropriateness of restructuring aid.

However, there are also costs to state aid, through related taxes and distortions to competitive conditions. Restructuring aid delays the exit of firms receiving the aid, leading to higher market share for firms receiving the aid at the expense of their rivals.¹³ In most cases, this may lead to a reduction in output and employment at rival firms. The possibility of restructuring aid may also affect the incentives faced by all firms in the market as a result of inefficient firms taking greater risks. This may lead to those efficient firms investing more conservatively, which may shift market share from the most efficient firms to less efficient firms.

The conclusions formulated by Oxera about the counterfactuals to state aid can be used as an input into the Commission's review of the Restructuring and Rescue Aid guidelines. Oxera also understands that the Commission intends to use the results of this study to inform the decision criteria for approving state aid, and, in particular, to inform on the formulation of the counterfactual scenarios in each case.

The recent global financial turmoil and the associated state interventions to minimise systemic risk ensure proper functioning of markets and future viability of the financial sector.

⁸ The research for this study has been carried out using information provided by Ernst & Young LLP, as well as a number of law firms and insolvency practitioners.

⁹ European Commission (2009d).

¹⁰ Ibid., para 28.

¹¹ Ibid., para 29.

¹² Ibid., para 17.

¹³ Economic Advisory Group on Competition Policy (2008).

This context highlights the relevance of the objectives of this study, while illustrating the importance of informed and measured considerations of state involvement in the private sector.

At the practical level, however, as the financial turmoil has been accompanied by a recession with significant implications for firms' future business and financial conditions, this study does not incorporate analysis of firms that have recently experienced financial difficulties since the outcomes of these cases are unknown at this stage.

1.2 Remit of Oxera's study

Until now there has been a policy presumption that the provision of restructuring aid saves a 'considerable amount of jobs and activities which would otherwise disappear'. This suggests that, to date, the evidence necessary to understand which cases or markets would benefit most from intervention, in terms of the impact on jobs and activity, has been limited or inadequate.

The focus of this study is therefore an in-depth economic analysis of the survival of a European-wide sample of firms in difficulty that have not received restructuring aid, accompanied by an assessment of the process of financial distress and its outcomes in terms of output, employment and general activity.

The main objective is to assess what might happen to a firm in the absence of restructuring aid, given general information from precedent about the performance of firms that have gone into distress, as well as information about the firm available to the Commission when it needs to make a decision. This report also identifies the indicators before and at the time of financial difficulty that can provide information about the business and social outcomes of distress at the firm and economy level.

Specifically in terms of empirical research, the Commission set out the following objectives:

The main objective of the study is to provide solid empirical evidence identifying in which cases and under which circumstances firms in difficulty survive without recourse to restructuring aid.

Specifically, the Commission seeks assistance in identifying markets/cases and circumstances where firms in difficulty survive without receiving restructuring aid and the net negative effect on employment and activity resulting from the difficulties of the firm remains limited.¹⁴

This task poses several critical challenges.

- There are many European firms that have gone into financial difficulty but for which detailed information, accompanied by robust, comparable financial data across different European jurisdictions, is very limited.
- Complex corporate links pose a challenge to clear delineation of cases of financial distress associated with a single corporate entity.

Outcomes of financial difficulty tend to be affected by firms' individual circumstances, making it difficult to draw generalised conclusions across firms, sectors, or countries. To address these challenges, the economic analysis at the centre of this study has adopted a three-tiered approach.

¹⁴ European Commission (2004b), pp. 2–17.

- The analysis of financial and business performance of a European-wide sample of firms in financial difficulty has been used to examine the performance of such firms. This sample has been carefully selected to ensure appropriate data coverage across different drivers of distress and jurisdictions to the extent that this information is available from comprehensive and comparable sources of data. This enables new insights to be provided into the evolution of firms' behaviour during the restructuring process, as well as drivers of the impact of financial distress on firm, regional and industry outcomes.
- Focused analysis of selected cases (case studies) has been used to highlight business and financial dynamics of firms in distress; this is particularly informative for analysing the economic process and outcomes of distress. These case studies help to gain a more in-depth understanding of the evolution of the activity of a firm in distress and to highlight specific factors that might be important in developing counterfactual scenarios.
- A careful review of existing empirical studies on the causes and outcomes of distress has been undertaken in order to capitalise on what has been analysed to date and to achieve a well-informed view of the consequences of financial distress. This approach ensures that findings from existing research are fully incorporated, and enables results from new empirical research undertaken for the purposes of this study to be compared with previous studies.

The analysis and findings from these three streams of research have also been discussed in the course of targeted interviews with market practitioners (insolvency practitioners and bankruptcy lawyers, in particular). The purpose of these structured interviews has been to gain a better understanding of the process of bankruptcy and restructuring across different jurisdictions and of the legal and market frameworks in which these processes take place.

1.2.1 **Developing criteria**

A follow-up objective to the analysis of past cases of financial difficulty was to use economic analysis to identify practical considerations and high-level decision criteria that can be used to develop counterfactual scenarios in the applications for state aid. These considerations are informed by firms' observed behaviour in the past.

In particular, the Commission has set as an objective:

the identification of a set of criteria that could be used by the Commission in identifying cases where restructuring aid might not be needed (i.e. because without aid the negative effect on employment and activity is limited and therefore the improvement which could result from the granting of restructuring aid is small or negligible) and should not be approved.

Since each case is different, the particular challenge is to provide insight into not only what information about counterfactual scenarios can be deduced from past cases, but also to what extent and how that information can be usefully mapped onto the specific information that might be available to the Commission in future cases. The challenge in the application of the conclusions of this project will then be to avoid a distortion of the case-specific information when applying generic rules and high-level findings from past cases.

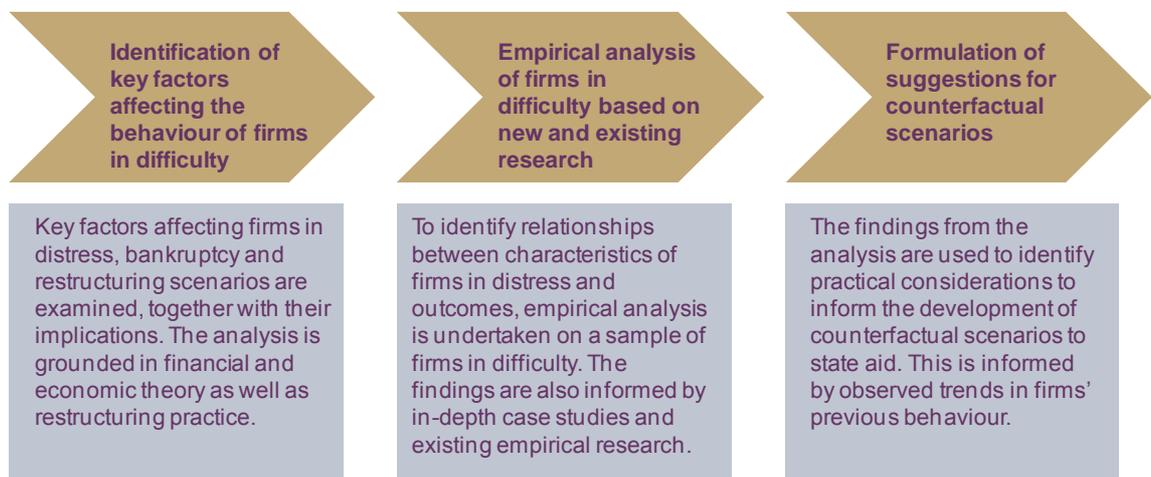
The mapping of the information from past cases onto future cases is informative to varying degrees, depending on the nature of each case. In particular, information from economic analysis of past cases might be more applicable to the analysis of hypothetical outcomes in the counterfactual scenarios to the extent that firm-, sector-, and economy-wide characteristics are comparable to past cases. Although, on average, across a large number of cases, the derived observations about counterfactual scenarios might be correct, this does not ensure that they would be relevant to each case.

When considering factors that might determine the outcome of distress in a particular case, the Commission could look at three types of information:

- historical and current information about the firm, sector and economy which, based on past cases, is expected to influence the outcome of distress and affect its magnitude (eg, severity of financial difficulty or capital structure);
- information about future observations that may influence the outcome of distress (eg, performance of the economy or sector over the next two to three years);
- specific information on idiosyncratic factors, such as litigation proceedings, that may be present in a particular case, which suggests that the distress would have a different impact than would normally be expected based on the first and second information sets above.

To reach conclusions on the factors mentioned above, the approach adopted in this study follows the critical steps outlined below.

Figure 1.1 Practical objectives of this study



Source: Oxera.

1.3 Policy context—state aid considerations

Until now, 'the Commission has taken for granted that the aid has positive effects on employment and the firm's activity, and has limited its intervention to minimizing distortions of competition and aid amounts' (European Commission 2008b). At the same time, while in some cases the consequences of distress could be less severe than anticipated in the absence of state aid, in other cases they could imply not only the firm's bankruptcy but also significant negative externalities.

Overall, the implication is that, until now, the evidence to understand which cases or markets would benefit most from intervention, in terms of impact on jobs and activity, has been limited or inadequate.

The Commission recognises that it might not have a sufficient evidence base from which to prioritise those firms and cases where the positive impact might reasonably be expected to be greater. Similarly, the evidence for the Commission to understand the aggregate impact of state aid intervention on jobs and activity in comparison to a counterfactual of no intervention may have been limited or inadequate.

In the context of the rising scale of state interventions in 2008–09, it is especially relevant that this missing evidence be collected and analysed.

1.3.1 **The rationale of rescue and restructuring aid**

State aid for the restructuring of firms in difficulty tends to follow from the provision of rescue aid. This aid has various justifications:

The provision of rescue or restructuring aid to firms in difficulty may only be regarded as legitimate subject to certain conditions. It may be justified, for instance, by social or regional policy considerations, by the need to take into account the beneficial role played by small and medium-sized enterprises (SMEs) in the economy or, exceptionally, by the desirability of maintaining a competitive market structure when the demise of firms could lead to a monopoly or to a tight oligopolistic situation. On the other hand, it would not be justified to keep a firm artificially alive in a sector with long-term structural overcapacity or when it can only survive as a result of repeated State interventions.¹⁵

In the case of employment, the failure of a firm may result in redundancies. If the labour market is not able to re-employ these workers readily and offer them alternative jobs, long-term unemployment may result, which could be harmful to the social fabric of a region. In addition, if the firm is sufficiently large, its failure could result in the breaking of a substantial chain of supply contracts, which could damage other firms, such as providers of raw materials and ancillary services. In certain circumstances (eg, in assisted areas), it may be desirable to stop such a chain reaction in order to avoid additional damage to the region.

The role of restructuring aid in potentially saving jobs is indeed highlighted in the Commission's guidelines as a benefit against which a distortion to competition may be offset:

The general principle should therefore be to allow the grant of restructuring aid only in circumstances in which it can be demonstrated that it does not run counter to the Community interest. This will only be possible if strict criteria are met, and if it is certain that any distortions of competition will be offset by the benefits flowing from the firm's survival (for instance, where it is clear that the net effect of redundancies resulting from the firm's going out of business, combined with the effects on its suppliers, would exacerbate employment problems or, exceptionally, where the firm's disappearance would result in a monopoly or tight oligopolistic situation) and that, in principle, there are adequate compensatory measures in favour of competitors.¹⁶

While the emphasis is on employment consequences, the net long-run effects of financial distress on economic output are of equal concern. The failure of a firm that is large, has firm-specific physical assets and labour, and has a network of suppliers and customers who cannot easily switch to alternatives may adversely affect regional output. If, for example, as a consequence of firm failure, a large number of jobs shift from high-value manufacturing to low-value basic retail, regional output growth may be significantly impaired in the long run.

1.3.2 **Overview of the rescue and restructuring aid rules**

Taking into account the potential distortionary effects that restructuring and rescue aid might introduce, the Commission's Restructuring and Rescue Aid guidelines intend to establish criteria that ensure that the aid does not distort competition. The guidelines distinguish between rescue aid and restructuring aid. There have been a number of more recent changes to aid rules, including the 'Temporary framework for State aid measures to support access to finance in the current financial and economic crisis'.¹⁷ As the purpose of this study is not to investigate the impact of the current financial crisis, these are not covered here.

¹⁵ European Commission (2004b), para 8.

¹⁶ *Ibid.*, para 31.

¹⁷ European Commission (2009c).

To be eligible for aid, the recipient must first qualify as a firm in difficulty, which is defined as one that:

is unable, whether through its own resources or with the funds it is able to obtain from its owner/shareholders or creditors, to stem losses which, without outside intervention by the public authorities, will almost certainly condemn it to going out of business in the short or medium term.¹⁸

Once it has been established that the company is in difficulty, the guidelines require, inter alia, that rescue aid be:

- warranted on the grounds of serious social difficulties—eg, in terms of the levels of unemployment that would be generated;
- accompanied by a restructuring or liquidation plan within six months of issuing the rescue aid (or proof that the loan has been reimbursed in full and/or that the guarantee has been terminated);
- sufficient to keep the firm in business only for the period during which the aid is authorised since a surplus amount may give the recipient of the aid a competitive advantage.¹⁹

As for *restructuring* aid, a measure must meet, inter alia, the following conditions:

- a viable restructuring/recovery programme should be submitted;
- the measure should avoid undue distortions of competition. To achieve this, the Commission requires the level of funds to be just sufficient to allow for the implementation of the restructuring plan. In addition, the recipient should contribute a proportion towards the costs of such a plan.²⁰

It is of note that both areas of rescue and restructuring aid must also adhere to the ‘one time, last time principle’, which states that aid can be granted to a recipient only once. The scheme would therefore have to be designed such that either the firm becomes competitive and does not require further aid, or it is dissolved. The principle seeks to avoid a situation whereby a firm is ‘propped up’ by continual aid grants.²¹

1.3.3 Application of the restructuring aid rules

The Restructuring and Rescue Aid guidelines were adopted in 1994. Glowicka (2008) shows that from 1995 to 2003, the Commission made 86 decisions to approve restructuring and rescue subsidies granted to 79 firms from ten EU countries. Nearly half of all cases involved firms in the manufacturing industry, a third of which went bankrupt after receiving aid.

On average, the firms that received aid employed more than 5,000 workers, suggesting that these were generally large firms.²² Of the 86 cases, 52 were approvals of restructuring aid. A large proportion of restructuring aid cases involved state-owned firms (ie, where the state controls more than 50% of the capital). However, it was found that almost 50% of all rescue aid recipients subsequently went bankrupt. These findings suggest that restructuring aid is given, and approved, typically for a large manufacturing firm, which may be partly state-owned.

¹⁸ Ibid., para 9.

¹⁹ To determine the amount of aid, the Commission uses a formula based on the operating needs of the firm, earnings before interest and taxes. See Annex to European Commission (2004b).

²⁰ In particular, small firms should contribute 25% of the cost of the restructuring plan; medium firms, 40%; and large firms at least 50%.

²¹ However, there are exceptions to this principle. For example, a firm might obtain R&R aid more than once if restructuring aid follows the granting of rescue aid as part of a single restructuring operation, or where, at the time of the decision to grant aid, the firm’s management could not have foreseen the financial difficulties. See European Commission (2004b), paras 72–77.

²² Glowicka (2008), p. 29.

The findings also indicate that some bailouts only delay, rather than prevent bankruptcy. For example, Glowicka (2008) finds that the likelihood that firms do not survive after receiving restructuring aid increases during the first four years, peaking in the fourth year and then dropping and staying at a lower level.²³ Although the aid recipient typically does not go bankrupt in the short term, exit rates may be higher than otherwise expected, considering that restructuring aid is granted conditional on a robust plan for survival.

This indicates types of firms for which the information about the likely counterfactual scenarios and factors that could influence the outcomes of distress might be particularly important to consider.

1.3.4 Risks associated with restructuring aid

It is recognised that state aid for the rescue and restructuring of firms might be one of the most distortive forms of aid.²⁴ Firms might be in difficulty because they are less efficient than their rivals. By subsidising such firms, state aid maintains companies which, under normal market conditions, would exit the market. Government funding might therefore perpetuate market inefficiencies. Furthermore, it might distort competition since firms that do not receive the subsidies find it difficult to offer prices as low as those of the recipient of the aid, or products of a similar quality, and hence struggle to compete.

Even if the market were to become a monopoly upon the exit of the recipient of the aid, government subsidies would not necessarily be justified. For example, the market might be characterised by economies of scale that are of such a size that only one company can operate efficiently. If the government attempts to promote competition by subsidising entry, both the incumbent and the entrant could end up with negative profits. Under these circumstances, government subsidies might introduce further distortions into the market.

The limited empirical research that is available has found that aid typically has little effect on whether a firm actually survives. For example, Chindooroy, Muller and Notaro (2005) found that the failure rate among recipients of restructuring aid is around 20%, with most failures occurring around recessionary periods. These exit rates correspond closely to the findings of Glowicka (2008).

According to Chindooroy et al. (2005), the amount of aid appeared to have little effect on the chances of survival. The authors also found that if a company was in difficulty because of market decline or poor management, the chances of survival after receiving rescue or restructuring aid increased. They concluded that ‘failure rates are contemporaneously associated with the business cycle’, and that ‘determinants of survival are to be found, on average, outside the policy framework of rescue and restructuring State aid.’

The objective of this study is to identify in which cases and under what circumstances firms in difficulty might be expected to survive without recourse to restructuring aid, and where the negative effect on employment and activity remains limited. It therefore provides the counterfactual to studies such as Chindooroy et al. (2005), Glowicka (2008) and a study for the European Commission (London Economics 2004), which analyse cases where restructuring aid has been provided.

1.4 The financial crisis—implications for this study

The current financial crisis has heavily affected the EU financial sector as well as the wider economy. In light of the seriousness of events over the past two years, Member States across the EU have taken measures to assist financial institutions and stabilise the financial system, as well as to limit the impact on other parts of the economy.

²³ Ibid., pp. 37 and 43.

²⁴ Ibid., para 3.

The crisis has led to higher systematic risk in the financial system, which has affected competition and state aid rules, and the way in which rescue and restructuring rules are being assessed in the financial crisis.

In a number of communications to Member States, the European Commission has provided guidance on the design and implementation of state aid in favour of banks. In August 2009, it confirmed its commitment to restoring confidence and the proper functioning of financial markets.²⁵ Before this, in March 2009, the Commission highlighted a range of issues that Member States should consider when designing and implementing asset relief measures, in order to ensure a coordinated approach across the EU.²⁶ This set out issues relating to the rationale for asset relief as a measure to safeguard financial viability and underpin bank lending, longer-term viability of the banking-sector as well as budgetary sustainability.

In January 2009, the Commission provided guidance for recapitalisation schemes and opened the possibility for adjusting existing recapitalisation schemes.²⁷ Earlier, in October 2008, it adopted guidelines on how Member States can best support financial institutions in the crisis, explaining that aid measures, such as guarantees or bank recapitalisation schemes, can be cleared by the Commission very quickly if they fulfil certain conditions: the measures must be well-targeted and proportionate to the objective of stabilising financial markets, and must contain certain safeguards against unnecessary negative effects on competition.²⁸

These guidelines are based on the principles that underpin the existing rules on restructuring and rescue aid (see section 1.3), but take account of the exceptional circumstances applying to the financial sector in the crisis—these circumstances can be considered to constitute a ‘serious disturbance in the economy of a Member State’ within the meaning of the state aid rules (Article 87(3)(b)):

In the light of the level of seriousness that the current crisis in the financial markets has reached and of its possible impact on the overall economy of Member States, the Commission considers that Article 87(3)(b) is, in the present circumstances, available as a legal basis for aid measures undertaken to address this systemic crisis.²⁹

Given the severity of the crisis and its repercussions on other parts of the economy, the Commission has also adopted a temporary framework for providing Member States with additional possibilities to tackle the effects of the crisis on the real economy. The temporary measures allow Member States to address the difficulties experienced by companies seeking to obtain finance resulting from the credit squeeze caused by the financial crisis. While not comprising restructuring aid, the measures illustrate the exceptional circumstances of the current crisis and its profound output and employment consequences for the overall economy:

While the situation on financial markets appears to be improving, the full impact of the financial crisis on the real economy is now being felt. A very serious downturn is affecting the wider economy and hitting households, businesses and jobs. In particular, as a consequence of the crisis on financial markets, banks are deleveraging and becoming much more risk-averse than in previous years, leading to a credit squeeze. This financial crisis could trigger credit rationing, a drop in demand and recession.³⁰

The situation in financial markets and the wider economy may be expected to return to more ‘normal’ conditions at some point in the foreseeable future, although this does not mean that

²⁵ European Commission (2009e).

²⁶ European Commission (2009b).

²⁷ European Commission (2009a).

²⁸ European Commission (2008a).

²⁹ *Ibid.*, para 9.

³⁰ European Commission (2009c), section 1.1.

there is expectation of returning to the circumstances that prevailed before the crisis. In the context of this study, the final consequences of the crisis are not yet known, and it is therefore too early to take stock and assess the impact of the restructuring aid measures granted to date.

At the same time the current crisis raises important questions about the assessment of state aid, when and how it is, or should be, granted in exceptional circumstances, and the consequences of state aid on financial institutions, the stability of the financial system and the wider economy. In comparison to experience in the past, more recent events have brought to the fore the significance of systemic risks and the recessionary effects of a systemic crisis.

While an analysis of restructuring aid in such exceptional circumstances is highly relevant and important, this study does not directly cover the most recent current financial and economic crisis and thereby examine aid measures that have recently been granted. This is partly because of the exceptional nature of recent events, which raise new issues in particular for aid granted to financial institutions. More importantly, the full impact of the recent aid measures granted is yet unknown, the restructuring process for many institutions is only starting, and the final outcome is unclear.

1.5 Structure of this report

The content and purpose of each section are summarised below.

- Section 2 introduces the concept of financial distress and its possible drivers, the restructuring process and insolvency regimes, as well as the implications for outcomes in terms of output and employment. The section concludes with the formulation of questions and hypotheses to be tested.
- Section 3 outlines the methodology used to test the hypotheses of interest for this study. This includes the methodology for the assessment of past research and empirical results, the analysis of selected case studies of firms in difficulty, as well as statistical approaches to the analysis of a large database of European firms in difficulty.
- Section 4 details the sources of the data for the analysis and other information in light of the objectives of the empirical analysis. It also discusses the criteria used to identify firms in distress for the purposes of the empirical analysis—ie, it identifies the firms and events studied in the report.
- Section 5 presents the results of the empirical analysis of the evolution of a firm throughout the process of distress, as well as findings on the implications of financial distress for firm-level output and employment based on statistical analysis of a large database of European firms in difficulty and selected case studies.
- Section 6 outlines the implications of financial distress for output and employment at the firm, regional and industry level, based on existing empirical research on employment and output.
- Section 7 examines the implications of distress at the regional and industry level, using the findings from selected case studies as well as the statistical analysis on the European database of firms in difficulty.
- Section 8 concludes with a discussion of the implications for state aid considerations. This section outlines practical considerations for restructuring aid criteria and case practice.

- Appendix A1 presents a bibliography and details of the Internet sites used for the study.
- Appendix A2 describes the interviews undertaken with insolvency practitioners in the course of the study.
- Appendix A3 provides further detail on the firm-level results presented in section 5.

2 Distress and bankruptcy—setting the scene and formulating some hypotheses

As the objective of this study is to consider cases of firms in financial difficulty that do not seek restructuring aid and their particular circumstances, it is important in this context to examine the meaning of financial distress. As financial distress is a broad concept, and there is not a single definition of the characteristics that constitute financial distress, an important starting point is to consider how to identify firms in distress. This will ensure that the counterfactual scenarios to restructuring state aid are as robust as possible.

In order to develop the hypotheses to be tested in this study, it is important to understand the interactions between the various notions of difficulty and its drivers, the restructuring process and outcomes in terms of firms' survival rates, as well as the implications for output and employment.

Different interpretations of financial distress, based on economic and finance theory as well as practice, are examined in section 2.1, together with the Commission's definition of 'a firm in difficulty'. The interactions between the range of characteristics defining firms in financial distress, the restructuring process and the outcomes are described in section 2.2. These insights, together with the findings from existing empirical research (set out in section 6) have been used to develop the hypotheses to be tested in this study (see section 2.3).

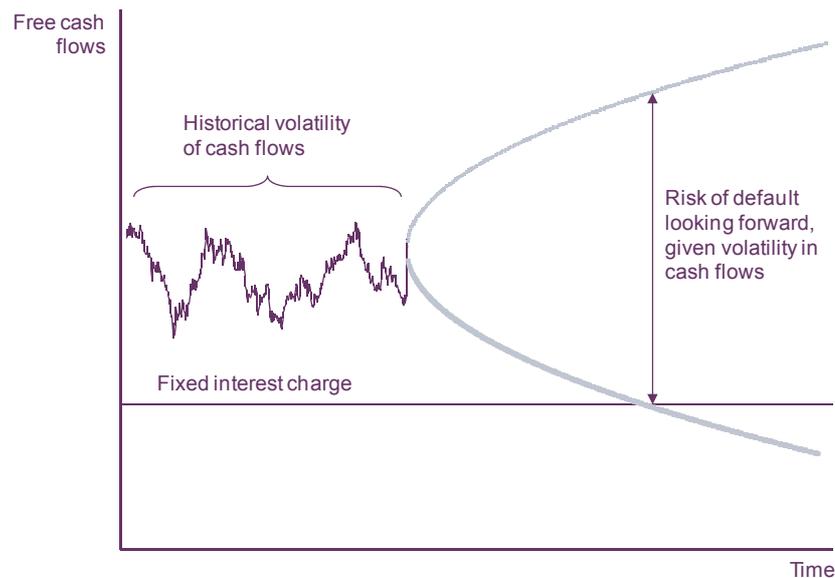
2.1 Notions of distress

Financial difficulties typically arise when a firm can no longer honour promises to creditors as it becomes illiquid or insolvent. However, there is no Community definition of what constitutes a 'firm in difficulty' (although the Commission does provide a set of characteristics that it would expect such a firm to exhibit—see section 4.4). Therefore, an important starting point for this study is to consider the meaning of a 'firm in difficulty', and how financial difficulty might manifest itself in the characteristics of a firm.³¹

The likelihood that a firm will experience financial difficulties is related to the level of uncertainty in its earnings and cash flows. Greater historical volatility in costs and revenues might indicate more uncertainty in earnings and cash flows going forward, contributing towards higher risk of default (as shown in Figure 2.1).

³¹ European Commission (2004b).

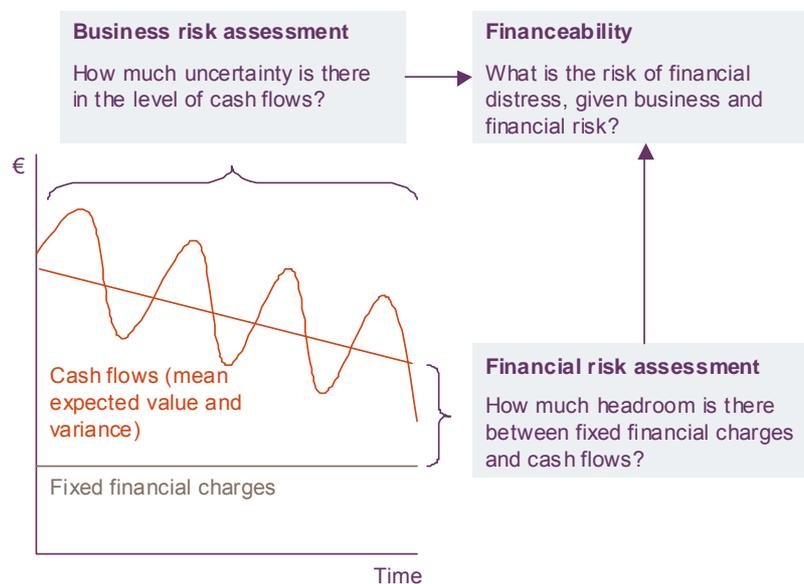
Figure 2.1 Relationship between the probability of default and cash-flow volatility (simplified illustration)



Source: Oxera.

The probability that a firm will run into financial difficulties depends on the degree of uncertainty surrounding the level of cash flows (as this implies a certain level of ‘business risk’)—greater uncertainty would imply a higher probability of default. In addition, the likelihood that a firm will experience financial difficulties will be influenced by the amount of headroom between the financial charges and the cash flows available to meet them (as this implies a certain level of ‘financial risk’) (see Figure 2.2).

Figure 2.2 Interaction between business and financial risk



Source: Oxera.

Firms with higher business and financial risk, all else constant, will have less headroom to absorb any external shocks. Therefore, if market conditions change (eg, there is a downturn in macroeconomic growth), these firms may be more likely to renege on their obligations to

debt holders, for example. However, defaulting on debt represents only one measure of distress—there are various other measures, as outlined in sections 2.1.1 and 2.1.2.

2.1.1 The Commission’s definition of a ‘firm in difficulty’

For the purposes of the restructuring aid guidelines, the Commission regards a firm as being in difficulty when:

it is unable, whether through its own resources or with the funds it is able to obtain from its owner/shareholders or creditors, to stem losses which, without outside intervention by the public authorities, will almost certainly condemn it to going out of business in the short or medium term.³²

In addition, the Commission’s guidelines state that, for a firm to qualify as being in difficulty, its capital must have reduced by more than half, more than a quarter of which must have been lost over the preceding 12 months.

These criteria are relatively broad and, as a result, firms that exhibit a variety of characteristics could be classified under these guidelines as being in difficulty. For example, firms that report losses, have negative net worth, or have breached a covenant or threshold for a particular financial ratio might meet these criteria to different degrees.

Furthermore, the guidelines do not clearly define short or medium term. To examine the meaning of financial difficulty, firms that have experienced a temporary business shock, but otherwise have a sound business model, should be delineated from those experiencing longer-term difficulties.

For the purposes of this study, the Commission’s guidelines relating to the definition of ‘a firm in difficulty’ have been supplemented with further criteria to ensure that the counterfactual scenarios to restructuring aid are as robust as possible. In particular, to mitigate the possibility that cases are examined where capital has fallen for reasons unrelated to the firm experiencing difficulties, additional criteria are applied in the statistical analysis of the large database of European firms in financial difficulty (outlined in section 4.3).

Despite the adoption of these criteria, there is a range of characteristics that firms experiencing difficulties might exhibit. For example, firms may breach covenants or thresholds for certain financial ratios; alternatively, they may not exhibit these characteristics, but may have negative net worth or report accounting losses.

2.1.2 Economic interpretation of financial distress

Financial distress is typically defined when a firm is unable to meet its financial obligations, such as its promised debt repayments, even when its underlying business might be fundamentally sound. For example, a firm may be financially distressed, but not economically distressed.

A firm may experience ‘normal’ business shocks during the course of its operations without being considered to be in financial distress. An important consideration is therefore the length of time over which the firm experiences difficulties and the distinction between a temporary and a less transitory financial shock.

Firms characterised by features such as losses, default, net worth falling below a certain threshold (or even becoming negative), a credit rating downgrade, or a breach of a specific covenant or threshold for a particular financial ratio might be considered to be in difficulty, although any one of these on its own might not be sufficient to constitute a difficulty. These characteristics are outlined in more detail below.

³² European Commission (2004b), para 9.

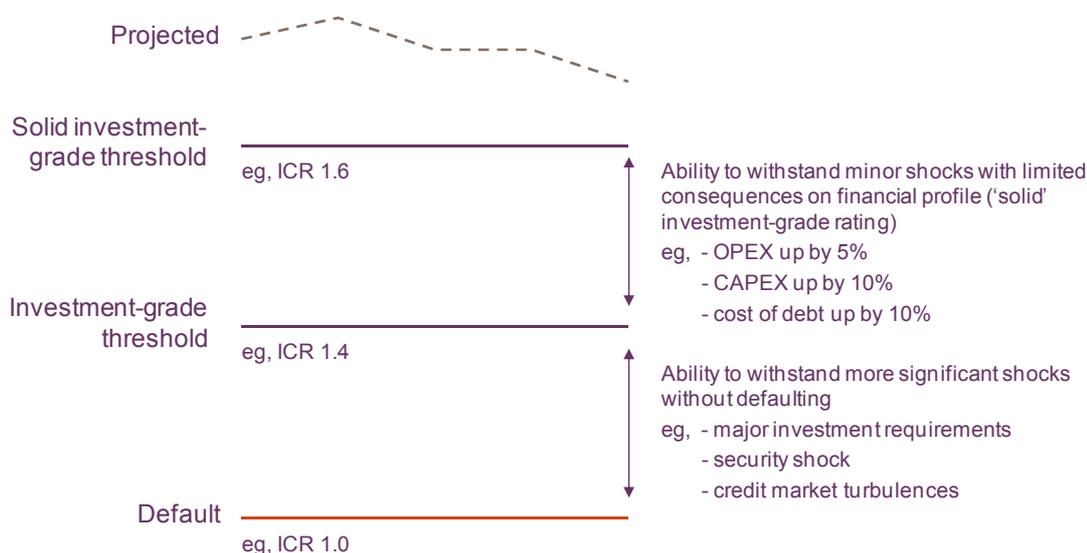
Credit rating downgrade

Credit ratings aim to measure the risk of default for specific firms or securities, and are used by market participants as an indicator of the risk of default. A downgrade to a firm's credit rating would reflect higher financial risk, with lower credit ratings typically corresponding to higher default rates. For example, a speculative-grade credit rating between BB and D would reflect higher financial risk than an investment-grade credit rating of BBB or higher.

When assessing a firm's creditworthiness, credit rating agencies consider a number of factors, including the firm's financial structure, but also its business risk profile and profitability. Ratings assessments aim to be forward-looking over a long time horizon, and assess a variety of qualitative and quantitative factors that contribute to a firm's risk profile, in addition to financial metrics.

Figure 2.3 illustrates the procedure typically adopted in credit rating assessments. A firm's ability to sustain a period of limited access to debt markets (eg, during a period of financial turmoil) can be tested by examining whether it would be able to curtail, temporarily, operating expenditure (OPEX) or capital expenditure (CAPEX) in order to finance its functions from its revenues.

Figure 2.3 Impact of business and market risk on ratio analysis



Source: Oxera.

Credit rating agencies typically focus on the following.³³

- **Profitability and coverage**—profit is the principal determinant of a firm's financial position and the level of protection that it enjoys against financial shock. Firms that generate large operating profits relative to operating costs have a larger source of cash that can be used to cover their financial obligations.
- **Cash-flow adequacy**—analysis of cash flows is often considered the most important aspect of credit-quality analysis and rating decisions. This is primarily because interest or principal payments cannot be serviced out of earnings. This is an accounting concept; payments have to be made with cash. Analysis of cash-flow patterns is therefore essential and may reveal either a stronger or weaker ability to meet financial obligations than may be apparent from earnings.

³³ S&P (2006).

- **Capital and corporate structure**—capital structure represents a key element of a firm’s financial position; managers who increase gearing affect the level of the firm’s financial risk due to the increase in its financial obligations. Similarly, corporate structure has an impact on the level of investor protection, insofar as claims over the cash flows of investors are specified at different levels of the corporate structure.
- **Liquidity analysis**—a company’s debt portfolio is analysed on a security-by-security basis. Factors considered might include the maturity profile of the company’s liabilities, the balance between short- and long-term forms of finance, the existence and scope of bond covenants, and the quality of insurers of bank issuers.

In addition, credit rating agencies consider the relationship between the volatility of assets and the probability of default. This is typically reflected in their approach to determine the thresholds for the financial ratios. For example, according to S&P’s business and financial risk metrics, the higher the business risk (as measured by the volatility of assets), the more stringent the thresholds for the financial ratios required for a given credit rating.

Financial ratios represent a mechanism for monitoring as well as incentivising a firm’s management to maximise efficiency, limit risks, retain a robust financial position, and allow third parties (eg, creditors) to take appropriate action when ratios point to an imminent deterioration in a firm’s financial situation.

Different stakeholders, ranging from shareholders and creditors to regulators, might examine financial ratios for different reasons. For example, creditors might require ratios that indicate whether the financial position is deteriorating, and the increasing likelihood of default; shareholders might analyse ratios to remedy the principal–agent problem, reduce asymmetric information and motivate management; regulators might assess financial ratios to ensure that a firm is not taking excessive financial risk that might prejudice the public interest.

Although financial ratios are informative in any assessment of a firm’s overall financial position, a breach of a financial ratio in one year may not, by itself, indicate that a firm is financially distressed. As a hypothetical example, a firm may breach an interest cover threshold of 2x but still have sufficient operating profit to cover its interest expense.

Default

Conceptually, the value of corporate debt depends on the required return on riskless debt and the probability that the firm will be unable to meet its obligations—ie, the probability of default. The critical driver of this is the volatility of the firm’s assets—the greater the volatility of the firm’s assets, the higher the probability that asset values will fall below the value of debt, and hence, the firm may default. Thus, all being equal, an increase in the volatility of assets leads to a decrease in the value of debt as the probability of default increases.

The probability of default could be proxied through the price of credit default swaps (CDS), which reflect the price of insurance against default risk and, hence, credit risk. Such metrics provide an indication about the probability of default leading to actual default. In practice, however, this data is not available for the majority of firms in the sample, and has therefore not been considered at this stage.

In principle, the appropriate benchmark that indicates whether default is likely to occur is a credit rating of D or below. However, there are no ex ante ratios that correspond to this rating; it is assigned only after an event of default (such as non-payment of a debt obligation or filing for bankruptcy).³⁴

³⁴ See S&P (2008).

Debt covenants

Firms that breach debt covenants might also be considered as experiencing financial difficulties. Empirical evidence shows that firms in difficulty are more likely to breach covenants and request renegotiations and/or waivers.³⁵ This may lead to an acceleration of repayments, magnifying the impact of the difficulty in the first place.

Debt covenants are typically designed to prevent value transfers between shareholders and creditors, as well as between different types of creditor, and to prevent management from taking excessive risks. However, the efficiency incentive properties of debt covenants might be limited since they create incentives to avoid the downside without corresponding incentives to maximise the upside.

Negative net economic worth

Negative net economic worth—ie, when the market value of a firm is lower than the face value of its debt—may represent an alternative feature of firms in difficulty. However, the relationship between negative net economic worth and the probability of default is not straightforward. Although negative net economic worth might be expected to be closely related to the probability of default, empirical studies have found that firms with negative net worth do not automatically default. For example, evidence has shown that the majority of firms in this position are unlikely to default for at least a year.³⁶

Liquidity shortages

Firms might be classed as experiencing financial difficulties when their liquid assets are not sufficient to meet their fixed obligations, including debt obligations, such as payments to suppliers and employees.³⁷ If a firm's short-term liabilities are high relative to its cash balance, this might indicate that it is experiencing financial difficulties.

2.1.3 Implications of alternative notions of distress

The range of potential characteristics of firms in distress illustrates that there is no single, common definition of financial distress; rather, it may manifest itself through a number of characteristics. As difficulty is relatively broadly defined in the restructuring aid guidelines, it is important to consider a wide range of features that may define firms in financial distress.

Applied economics and finance studies have tended to delineate economic distress from financial distress, although the two are closely related.³⁸ As discussed in this section, financial distress relates to a firm's debt obligations, and refers to a firm's ability to meet its interest payments given its financial structure. Firms can be financially distressed and experience difficulties in making ongoing debt payments without being economically distressed. In contrast to financial distress, economic distress refers to the health of a firm regardless of its financial structure, with economic distress typically arising when a firm's prospects deteriorate, and the value of its productive assets declines.³⁹

Empirical studies have found that financial distress is more common than economic distress.⁴⁰ This study focuses on the former, but covers firms that have experienced difficulties as a result of economic drivers. This is taken into account in the empirical analysis of the case studies and the statistical analysis of the large sample of European firms that face difficulties.

³⁵ Davydenko (2009).

³⁶ Ibid.

³⁷ Hotchkiss et al. (2008).

³⁸ Davydenko (2009).

³⁹ Davydenko (2009).

⁴⁰ Andrade and Kaplan (1998).

2.2 Process of financial distress (including bankruptcy and restructuring)

For the purposes of this study, it is important to examine the interactions between the notions of difficulty and its drivers, the restructuring process and the outcomes in terms of the firm's survival rate, and the implications for output and employment. This section therefore considers the process of financial distress, to enable detailed insights to be drawn about the implications for output and employment. These insights are then used to develop the hypotheses to be tested in this study.

To provide in-depth analysis of the survival rate of firms in difficulties, and the effects on employment and the activity of these firms, the evolution of firms throughout this process has been examined. This includes examination of the drivers that lead firms to experience difficulties and potential forms of the restructuring process, together with analysis of outcomes in terms of whether the firm survived and, if applicable, the form in which it survived.

This section considers a typical process that might be followed by a firm in difficulty, starting from the initial drivers of financial difficulty to the possible outcomes from the restructuring or liquidation process. This is illustrated through an examination of one of the case study firms, Metallgesellschaft, a German industrial conglomerate, which experienced difficulties as a result of losses on its derivative positions in the global commodities market. A \$1.9 billion rescue operation by German and international banks kept the firm from entering formal insolvency.

2.2.1 Causes of distress

Analysis of the drivers of a firm's difficulties can provide important insights in terms of predicting what might happen during financial distress, as well providing insights into the impact on activity and employment, post-distress. Typically, the factors that contribute towards difficulties can be classified into four high-level categories:

- **revenue drivers**—factors related to reductions in revenue typically driven by a reduction in demand for a firm's products. Reasons might include economy-wide changes in the demand for (or prices of) a firm's products; industry-specific factors such as new market entrants or competitors; or the introduction of new technologies by existing competitors. Causes of distress in this category are typically related to external shocks;
- **cost drivers**—increases in costs, either in input markets or a firm's own costs, which, if not be passed on to consumers, will have an adverse effect on a firm's profitability and position. Possible drivers in this case might include the rigidity of the labour market, or a firm's inability to reorganise its cost structure in response to external cost shocks and changes in economic conditions;
- **cash-flow drivers**—in addition to revenue and cost drivers, which might also affect a firm's cash flows, other important cash-flow drivers include the management of working capital and discretionary spending. For example, inadequate management of working capital (such as failure to control rising levels of stock or late payments by customers) may place constraints on a firm's cash flow. This category includes causes of distress typically related to liquidity issues, as opposed to fundamental changes to the value of the firm;
- **financial drivers**—drivers of distress related to a firm's financial structure and method of financing, such as the level of gearing—which reflects the extent to which a firm uses debt financing (with fixed contractual repayments) as opposed to equity capital—or the type of debt financing on a firm's balance sheet, including covenants. Causes of financial distress in this category are typically associated with an aggressive financial structure and/or financial risk management.

Metallgesellschaft: key drivers

Metallgesellschaft's difficulties were caused by financial factors. The firm had experienced substantial negative cash flows for a considerable period of time leading up to late 1993, largely the result of declining oil prices, which reduced the value of its derivative positions and ultimately led to calls from counterparties for increased margins.

The negative impact on the firm's cash flow due to the need to fund higher margin requirements was compounded by the prices of the derivatives that the firm had used to hedge its risks being above spot prices during most of 1993. The firm thus suffered substantial funding costs each time its derivative positions were required to be rolled forward.

Different drivers of difficulty may influence the outcome of the restructuring process, with implications for output and employment. For example, a firm may reduce output and employment to a greater extent following the onset of difficulties if the driver of such difficulties is related to a permanent shift in demand rather than a more temporary reduction in demand caused by macroeconomic conditions. In the latter case, a firm's difficulties might be expected to reverse as the business cycle runs its course. In the former case, a firm's revenue might continue to be constrained until it is able to find alternative means to mitigate the impact of the shift in demand, by, for example, introducing new products or services.

This illustrates the conceptual economic links between the causes of financial difficulties, on the one hand, and the impact on output and employment, post-distress, on the other. The outcomes will, however, be influenced by the restructuring process (as outlined below).

2.2.2 The restructuring process

During the restructuring process, a firm will seek to mitigate those factors that led to difficulties in the first place. The impact on activity and employment will therefore differ significantly depending on whether, for example, the difficulty is triggered by a firm's financing structure or by a permanent shift in demand.

Restructuring can take place along a number of dimensions. Mechanisms for resolving financial distress do so through rectifying the asset–liability mismatch by restructuring assets or financial contracts (liabilities), or both.

Financially distressed firms may face a liquidity shortfall, yet be constrained in their ability to raise external funds to meet their obligations. In this situation, asset restructuring may serve as an alternative source of funds through which firms can generate cash. In contrast, liability restructuring is typically designed to mitigate financial distress by replacing existing debt with a new debt contract that reduces the interest or principal payments, or extends the maturity of the debt.

Possible forms of asset restructuring are outlined below and followed by a discussion of the likely outcomes from restructuring.

Possible forms of asset restructuring

Asset restructuring is one means through which bankruptcy may be avoided. For example, Asquith, Gertner and Scharfstein (1991) report that asset sales are an important means of avoiding bankruptcy—they find that only 3 out of 21 firms that sold over 20% of their assets subsequently filed for bankruptcy, compared with 49% of firms with little or no asset sales.

Asset restructuring can take a number of forms, including:

- **asset disposals**—to improve the balance sheet position, a firm may sell off non-core assets and use the proceeds to pay down debt obligations;
- **reduction in output**—if a firm has expanded too quickly, it may scale back its operations in order to reduce variable costs;

- **input substitution**—a firm may change production methods such that input requirements are reduced.

Possible forms of liability restructuring

Under a number of forms of liability restructuring, control is effectively transferred to the creditor, who becomes the residual claimholder, in line with the contingent financial contract on the debt. Two of the most common forms of *liability restructuring* are:

- **distressed exchanges**—a firm may issue securities to redeem outstanding debt obligations, which may take the form of a direct debt–equity exchange with creditors, or the sale of securities to outside parties in order to raise cash with which to buy out existing creditors;
- **maturity extensions**—a firm may negotiate with existing creditors to extend the period over which interest and principal payments are to be paid. For example, creditors may agree to write down or defer a proportion of the face value of the debt.

Metallgesellschaft: restructuring process

Metallgesellschaft undertook restructuring of both its assets and liabilities. Its liability restructuring included three main elements: an increase of its nominal capital; conversion of debt into equity; and an extension of credit lines. In addition, it undertook a series of asset restructuring: in February 1994, the Board announced that the firm would no longer be active in the core areas of raw materials, mining, non-ferrous metal production and processing.

By November 1994, the asset sales instituted in December 1993 had generated more than DM4 billion, with disposals of more than 90 subsidiaries.

Both liability and asset restructuring can take place through a formal court-adjudicated process, through a voluntary out-of-court workout, or through some combination of the two. The selected method depends on the relative costs and benefits of each mechanism as well as the legal regime, among other factors. For example, according to Hotchkiss et al. (2008), most firms attempt to resolve their difficulties through out-of-court restructuring (through either a workout or exchange offer), without resorting to formal bankruptcy proceedings—primarily because private mechanisms are typically less costly. Franks and Torous (1994) find that firms have greater value to share in workouts than in bankruptcy, with senior creditors in workouts being willing to forgo a greater share of the value of the reorganised firm in favour of equity holders.

Informal resolutions

Business adjustments and ownership changes may be achieved through an informal resolution. A firm in difficulty may be bought by a competitor in order to realise synergies, or a financial investor (such as a private equity house) may replace a firm's incumbent management.

Gilson, John and Lang (1990) find that the probability of completing an out-of-court restructuring is higher for firms with a greater proportion of intangible assets. This is attributed to the value of intangible assets being more likely to fall in bankruptcy because of asset 'fire sales' or declining customer demand. Since bankruptcy is relatively more costly for firms with more intangible assets, these firms have a greater incentive to preserve value through an out-of-court restructuring.

Formal resolutions

As pointed out by Hotchkiss et al (2008), impediments may hinder private restructurings, including problems related to asymmetric information and conflicts of interest among claimants.

As an alternative to an informal resolution, a firm and/or its creditors may resort to formal bankruptcy procedures, such as restructuring, foreclosure and liquidation.⁴¹ Alternatively, under a hybrid approach, the parties might agree a resolution out of court, with the courts confirming the resolution process.

Bankruptcy codes

Bankruptcy codes significantly influence the restructuring process and firms' survival rates, as well as the impact on employment and output. For example, Franks and Davydenko (2008) find that, despite evidence of banks adjusting their practices in response to particular provisions of the bankruptcy code, the code still has a significant influence on the outcomes of distress.

Although bankruptcy codes vary across Member States, some aspects of the code are sufficiently similar to enable national legal systems to be classified into major families of law. La Porta et al. (1998) group jurisdictions according to the characteristics of the bankruptcy code on the basis of a legal scoring system, while Djankov et al. (2008) group jurisdictions according to their legal origins.⁴²

The classification in La Porta et al (1998) is illustrated in Figure 2.4; in this, a higher credit score suggests that a greater degree of protection is provided to investors. As shown, protection for creditors is the weakest in French civil law countries, with French bankruptcy courts having control of the bankruptcy process and typically not mandated to sell the firms' assets to the highest bidder.⁴³ This feature of the bankruptcy law may act to preserve employment in France, compared with a regime, such as the UK, where investors' protection is considerably higher.

Figure 2.4 Categorisation of jurisdictions

Country with credit score of four or three	Country with credit score of two	Country with credit score of one or zero
Austria (3) Czech Republic (3) Denmark (3) Germany (3) Latvia (3) The Netherlands (3) Slovenia (3) United Kingdom (4)	Belgium (2) Bulgaria (2) Italy (2) Lithuania (2) Norway (2) Slovak Republic (2) Spain (2)	Finland (1) France (0) Greece (1) Hungary (1) Ireland (1) Poland (1) Portugal (1) Romania (1) Sweden (1) Switzerland (1)

Source: Based on La Porta et al. (1998).

Across each of the jurisdictional groups outlined in Figure 2.4, the bankruptcy regime varies along several dimensions, as outlined below.

- **Legal origins.** The French bankruptcy code emphasises the preservation of operations and employment. As a result, French bankruptcy courts might be expected to be more likely to sell assets below their market price in order to preserve employment. In contrast, under UK law, control rights in bankruptcy typically reside with secured creditors.

⁴¹ Djankov et al. (2008).

⁴² See Appendix A2 for a discussion of Djankov's (2008) classification.

⁴³ Djankov et al. (2008).

- **Shareholders' and creditors' rights.** Common law countries typically afford the best legal protection to shareholders, while French civil law countries have typically been found to offer shareholders and creditors the weakest protection.
- **Legal enforcement.** In principle, a strong system of legal enforcement might substitute for weak rules, since active and well-functioning courts might aid those investors with a minority claim. La Porta et al. (1998) find that an investor in a French civil law country is both poorly protected by the law as well as by the system enforcing that law. The opposite is found for an investor in a common law country.

The above factors are likely to influence the impact on output and employment. For example, a firm in difficulty operating under the French legal system may be more likely to be preserved as a going concern, and hence the impact on output and employment may be lower than for similar firms operating under the English legal system. Furthermore, a firm in difficulty that operates in jurisdictions where shareholders and creditors have less protection may face difficulties raising external finance, which may have implications for the survival rates of such firms. For example, stronger creditor rights may result in a higher percentage of piecemeal liquidations, or, by contrast, make workouts easier to negotiate with owners as it increases creditors' bargaining power.

2.2.3 Outcomes of the restructuring process

Asset or liability restructuring can involve a change in the structure of legal ownership. Assets can be sold piecemeal or in their entirety to other firms and new management teams, while forms of liability restructuring, such as debt for equity swaps, often redistribute much of the equity in a firm.

- **Distressed debt restructuring** typically results in a substantial change in the ownership of a firm, primarily because poor performance typically results in a decline in the value of equity such that shareholders often receive little or no equity in the reorganised firm. Much of the reorganised firm's stock is distributed to a subset of existing creditors, who become the new owners of the firm. Following the initiation of insolvency proceedings, the creditors may choose to manage the company themselves as a going concern, or to work with existing management to effect a recovery.
- **Sale as a going concern.** Factors such as the dispersion of creditors, the presence of different types of creditor, and the maturity of a firm's debt will all influence creditors in deciding to liquidate the firm or preserve its 'going-concern value'. This has an influence on firms' survival rates and on the impact on output and employment.
- **Piecemeal sale of assets.** If a firm has a greater value as a going concern that might be achieved through the selling off of individual assets, its individual assets may be sold to separate outside parties.

2.2.4 Outcomes for output and employment

The drivers of difficulties, as well as the form of the restructuring process and the applicable bankruptcy code, will have implications for firms' survival rates, as well as for the form in which they survive. For example, defaulted firms might be expected to be less likely to survive as going concerns in creditor-friendly countries such as the UK, where secured creditors have wide discretion to sell their collateral, and so the reduction in output and employment following the onset of difficulties may be greater in these jurisdictions.

The evolution of both employment and output will vary through time. For example, firms whose cost base is relatively fixed may take time to reduce the scale of their operations after the onset of difficulties. The evolution of employment is also likely to differ in the short as opposed to the medium or long term—for example, workers who are displaced after a firm experiences difficulties may take time to find alternative employment opportunities.

Impact of Metallgesellschaft's difficulties on output and employment

Between September 1992 and September 1995, Metallgesellschaft reduced its workforce from around 62,500 to round 23,400 in response to the difficulties it was experiencing. A large proportion of this reduction in workforce was the result of significant divestments of assets, as well as restructuring measures adopted by the firm.

2.3 Formulation of relevant questions and hypotheses for testing

In light of the conceptual issues relating to financial distress (discussed in previous sections), this section outlines the principal questions and hypotheses that the current study seeks to answer, and the motivation for those hypotheses.

- **A first set of questions seeks to elucidate the key aspects of the process of distress.** These relate to the nature of developments prior to and following distress, based on an examination of the key trends observed in the sample of firms and on findings from selected case studies.
- **The second set of questions is formulated as a set of hypotheses that relate the development of ex ante variables prior to the onset of financial distress to the evolution of variables of interest following distress.** These hypotheses can then be tested on the basis of empirical analysis, findings from existing empirical analysis, and from selected case studies.

The hypotheses relating to empirical links between ex ante and outcome variables are grouped according to the outcome variables to which they relate, at the firm, regional and industry level. The overall structure of the hypotheses framework is discussed in section 2.3.4, with section 2.3.7 presenting the list of hypotheses to be tested.

2.3.1 Framework of hypotheses relating to the development of the distress process

While the study is conducted without any preconceptions about what the precise developments of a firm during the process of distress might be, hypotheses have been constructed that can be tested through the empirical analysis, and developed according to the findings from a detailed review of existing empirical studies.

Developments following distress

Table 2.1 lists key questions relating to the development of distressed firms following the onset of distress. For each question, a corresponding hypothesis is presented that can be tested on the basis of the empirical analysis.

Table 2.1 Hypotheses relating to the development of firms following the onset of distress

Principal question	Corresponding hypothesis to be tested
What is the survival rate of firms following distress?	More than half of firms ultimately cease activities under their legal form as at the point of distress
Does the survival rate of firms in distress vary across sectors and countries?	The rate of survival among distressed firms varies across sectors and countries
How do firm-level output and employment develop following distress?	Firm-level output and employment fall significantly following distress
Does the change in post-distress output and employment vary across sectors and countries?	The extent of changes in firm-level output and employees following distress varies significantly across sectors
At what point do firm-level output and employment reach a minimum, post-distress?	Firm-level employment and output have begun to recover by the third year following distress
At what point (if any) do firm-level output and employment fully recover, post-distress?	Firm-level employment and output have fully recovered by the third year following distress

Source: Oxera analysis.

Developments prior to distress

Table 2.2 lists the principal questions and corresponding hypotheses relating to the development of firms prior to distress.

Table 2.2 Hypotheses relating to the development of firms prior to the onset of distress

Principal question	Corresponding hypothesis to be tested
Do the distress criteria employed capture firms before or after they begin to reduce output and employment?	Distressed firms begin shedding employees and reducing output prior to the onset of distress
Do the distress criteria employed capture firms before or after they exhibit deteriorating financial metrics?	Distressed firms exhibit observable deterioration in financial metrics prior to the onset of financial distress Deterioration in distressed firms' financial metrics begins at least three years prior to distress

Source: Oxera analysis.

2.3.2 Overview of key types of outcome

The Commission has highlighted some outcome variables of interest for this study, which include both firm-level outcomes in terms of effects on employment and the activity of those firms, and the outcomes in terms of the impact on regional and industry activity and employment (see Table 2.3).

Table 2.3 Final outcomes by type

Outcome	Proposed metric
Firm-level outcomes	
Employment	Firm-level employment
Activity	Firm-level revenue
Regional-level outcomes	
Impact on regional employment	Total regional employment
	Proportion of workers in the region that are laid off by the firm and remain unemployed
Impact on regional activity	Regional GVA
Regional industry outcomes	
Impact on industry employment within a region	Total employment within an industry in a particular region
Impact on industry activity within a region	GVA within an industry in a particular region
Industry-level outcomes	
Impact on industry employment	Total industry employment
Impact on industry activity	Industry revenue

Source: Oxera.

2.3.3 Survivability outcomes

In addition to assessing the evolution of the final outcomes, the analysis examines variation in survivability rates across jurisdictions, sectors and size, and aims to test the relationship between ex ante characteristics and survivability rates.

Survivability rates indicate the likelihood that firm-level employment and output will not fall to zero. A survivability rate of 100% indicates that the firm is not expected to shut down altogether and that firm-level employment and output post-restructuring are expected to remain greater than zero.

There is extensive existing empirical research regarding the determinants of survivability outcomes, which have been well documented by, among others, credit rating agencies and academic sources. For example, there is some evidence from past research to suggest that the length of time spent in formal insolvency has a negative impact on the ongoing value of the firm, and therefore implicitly affects post-restructuring employment and output—see, for example, Thorborn (2000) and Bris et al. (2006).

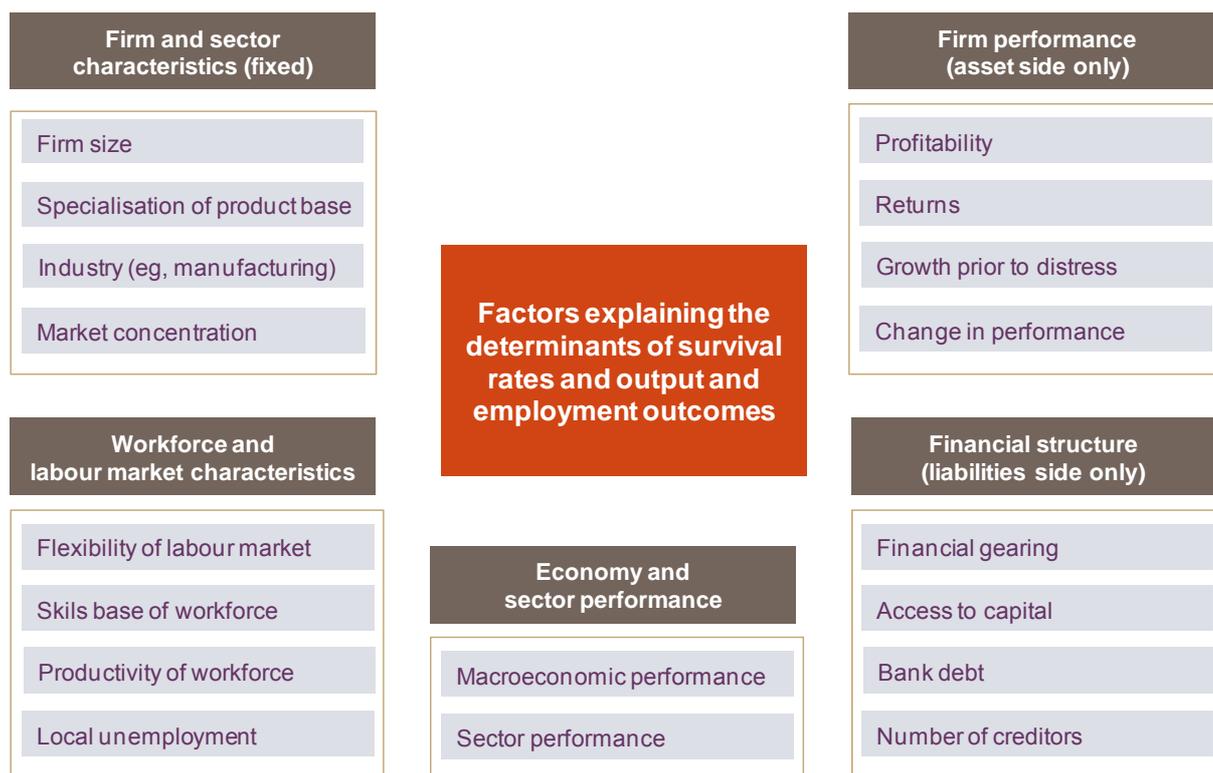
2.3.4 Framework of hypotheses relating to empirical links

In line with the objectives of this study, the hypotheses that will be tested relate to the relationships between:

- the onset of difficulties and the severity of firm distress and firm-level outcomes; and
- firm-level outcomes and regional- and industry-level outcomes.

These hypotheses are tested by examining factors that may explain outcomes at the firm, regional or industry level. These factors can be grouped into five distinct categories (see Figure 2.5).

Figure 2.5 Possible factors explaining the determinants of survival rates and output and employment outcomes



Source: Oxera.

- **Firm and sector characteristics (fixed)**—attributes of firms and sectors that cannot be altered, at least in the short run, which may include the size of the firm and the degree of specialisation of its products. Although the firm in distress may be able to alter these factors in the medium to long term—for example, by selling the poorest-performing business divisions—these factors are fixed in the short term.
- **Firm performance (asset side only)**—measures of the firms’ financial and business performance that could be defined over the period prior to, at, or after, the onset of distress. The financial measures capture a firm’s ability to generate returns from its asset base, and include measures such as the ratio of earnings to assets. Business performance measures provide an indication of the success of a firm’s ongoing operations and can be captured through measures such as growth in revenues.
- **Financial structure (liabilities side)**—this reflects the composition of a firm’s financial structure and the ability of the firm to access capital markets, among other aspects. The way in which firms can finance their ongoing business activities would be expected to influence whether they survive following the onset of distress.
- **Economy and sector performance**—this covers wider macroeconomic conditions as well as measures of sectoral performance, which are likely to influence outcomes post-distress.
- **Workforce and labour market characteristics**—features of labour market legislation across Member States as well as characteristics of workers, such as their skills base, that would be expected to influence both the ease with which firms are able to reduce employment following the onset of distress and the likelihood of displaced workers finding alternative employment.

2.3.5 Motivation behind the hypotheses relating to empirical links

The hypotheses outlined are related directly to the objectives of this study and have been developed through a review of the existing empirical research. This section explains why the existing studies motivate certain hypotheses.

Firm-level hypotheses

One set of hypotheses seeks to explain the evolution of employment and activity outcomes at the level of the firm.

Severity of financial distress. A set of hypotheses relates to whether any measures of financial performance can partially explain the employment and activity outcomes—ie, whether the severity of distress can inform these outcome variables.

Creditor structure. A number of studies have examined whether the type and complexity of a firm's financial structure (eg, whether creditors are dispersed) tends to increase the cost of distress. Therefore, a set of hypotheses relates to whether these factors explain ex post employment and activity outcomes.

Asset specificity. This reduces the possibility that assets can be transferred to other firms in the industry, which may contribute towards lower recovery rates.

Characteristics of the insolvency regime. The legal origin of the insolvency regime and the degree of creditor orientation are key characteristics of the insolvency regime that might affect employment and activity outcomes.⁴⁴

2.3.6 Hypotheses relating firm-level distress to regional and industry outcomes

Another set of hypotheses posits that firm-level employment and activity outcomes will have consequences for the level of regional and industry employment and activity. This might be as a direct consequence of the firm shedding labour and cutting output, or through ramifications on other firms in the region, industry or country.

Given firm-level consequences in terms of employment and activity, several factors will influence how these translate into regional and industry outcomes:

- a proportion of any reduction in activity and employment at the firm level might be transferred to rivals;
- the negative effect on activities at the firm level may affect a firm's suppliers and customers in vertically integrated industries;
- if the defaulted firm is a large regional employer, the firm's financial distress may have a macroeconomic influence on the region.

Effect on rivals

Financial distress for one firm can have valuation implications for firms that are linked in the product market (industry rivals) as well as for firms that are connected along the supply chain (customers and suppliers). Feedback effects can arise when rivals, customers and suppliers respond to a linked firm's distress.⁴⁵ There have been a number of studies on the effects of bankruptcy announcements on competitors' stock prices, which have shown that:

- there is a contagion effect—the announcement carries information about the state of the industry and therefore has a negative impact on competitors' returns;
- there is also a competitive effect, which may be dominant in concentrated industries. In such industries, competitors may try to gain additional market share if one of their rivals

⁴⁴ La Porta et al. (1998), and Franks and Sussman (2005).

⁴⁵ Hertz et al. (2008).

experiences distress. This implies that the effects on total output and employment in the industry may be more negative in less concentrated industries.⁴⁶

Effect on the value chain

Suppliers also suffer from a firm's bankruptcy, and where an industry is characterised by strong vertical integration, this effect may be sizeable.⁴⁷ In these specific instances, the loss of employment and activity at the regional level might exceed the effects of distress observed at the firm level. This may occur if the distressed firm plays a crucial role in the industry and there are not close substitutes for its products—for instance, if the firm in distress is an important supplier for the regional economy, or if there are a number of firms in the region that are sub-contractors to the firm in distress.

The relationship between firm distress and regional or industry activity and employment outcomes has been examined by national and international institutions. For example, Hurley and Fernández-Macías (2008) study the effects of insolvency proceedings involving integrated companies by identifying the number of occurrences of significant job losses at a regional level from 2002 to 2007.

Macroeconomic ramifications on the regional economy

Where a firm in financial difficulty is one of the main employers in the region, a large number of redundancies can cause a negative macroeconomic shock on demand in the region, which can have ramifications on other sectors of the regional economy. For example, Avonds et al. (2002) studied the impact of the bankruptcy of former Belgian national airline, SABENA. Their results indicate that bankruptcy might be expected to lead to a decrease of between 0.3% and 0.5% of GDP, with effects in sectors unrelated to the transport industry.

Hypotheses for regional/industry activity and employment

The hypotheses for regional/industry activity and employment outcomes can be grouped into three categories; namely those that relate to:

- **firm and sector characteristics**, most importantly the firm's size (relative to the region and the industry—eg, in terms of output), its sector, its capital intensity and capacity utilisation (which influences the likelihood that assets/employees are taken over). For instance, if a firm is an important component of a sector characterised by a strong interrelation between upstream and downstream firms, the distress of the firm could harm firms located at different points in the value chain, and financial distress could propagate through externalities between firms;
- an extension to this set of hypothesis (that is tested) is the impact of 'clusters' of distressed firms on broader regional and industry outcomes. The rationale behind this is that, given the small size of most firms relative to their industry or region, in many cases it will not be possible to observe significant impacts of firm characteristics on aggregate regional and industry employment and output. However, it might be possible to observe these effects when a number of firms with similar characteristics (including the firm-level characteristics under observation) enter into distress simultaneously;
- **sector characteristics**, such as the relevance of the sector to the regional economy, the degree of import penetration (and more specifically, any increase in international competition), capacity utilisation (that influences the likelihood that assets/employees are taken over) and industry profitability;

⁴⁶ See, for example, Jorion and Zhang (2006) and Lang and Stulz (1992).

⁴⁷ See, for example, Boissay and Gropp (2007), and Boissay (2006). Bradley and Rubach (2002) are cited as finding that 31% of bankrupt entrepreneurs ranked non-payments of trade credit as the most important cause of their bankruptcy, higher than poor sales.

- **workforce and labour market characteristics**, such as the tightness of the local and national labour markets and the flexibility of local labour institutions.

2.3.7 List of hypotheses to be tested

A set of detailed firm- and regional-level hypotheses are set out in the tables below, specifying the relationships between key dependent and independent variables, and controlling for critical control variables.

Table 2.4 Firm-level hypotheses to be tested

Dependent variable	Intermediate outcomes	Independent variables	Control variables	Hypothesis
Firm-level output and employment following distress	Survival rates	Severity of distress	Sector and jurisdiction	Within a given sector and jurisdiction, more severe financial distress leads to a greater reduction in firm-level output/employment following the onset of distress
Firm-level output and employment following distress	Survival rates	Financial structure	Severity of distress	Controlling for the severity of distress, more highly geared financial structures will lead to a greater reduction in firm-level output/employment following the onset of distress
Firm-level output and employment following distress	Survival rates	Creditor structure (number of creditors)	Severity of distress Whether firm entered formal bankruptcy	Greater dispersion of creditors reduces firm-level output/employment following bankruptcy
Firm-level output and employment following distress	Survival rates	Creditor structure (bank debt as % of total debt)	Severity of distress Whether firm entered formal bankruptcy	A greater proportion of bank debt in a firm's financial structure leads to smaller reductions in firm-level output/employment following bankruptcy
Firm-level output and employment following distress	Survival rates	Overall cost of insolvency regime	Severity of distress Financial and creditor structure Whether firm entered formal bankruptcy	Firms that enter into formal insolvency proceedings under insolvency regimes that are more costly will be more likely to reduce output/employment following bankruptcy
Firm-level output and employment following distress	Survival rates	Individual aspects of insolvency regimes Creditor structure	Severity of distress Whether firm entered formal bankruptcy	Each of the various aspects of different insolvency regimes has an impact on the reduction in firm-level output/employment after a firm enters into formal bankruptcy. This impact will depend on the financial and creditor structure of the firm
Firm-level output and employment following distress	Survival rates	Asset substitutability	Severity of distress Financial structure	Greater asset substitutability (whether a firm's assets can be bought by another company) will lead to smaller reductions in firm-level output/employment following the onset of distress

Source: Oxera.

Table 2.5 List of regional and industry-level hypotheses to be tested

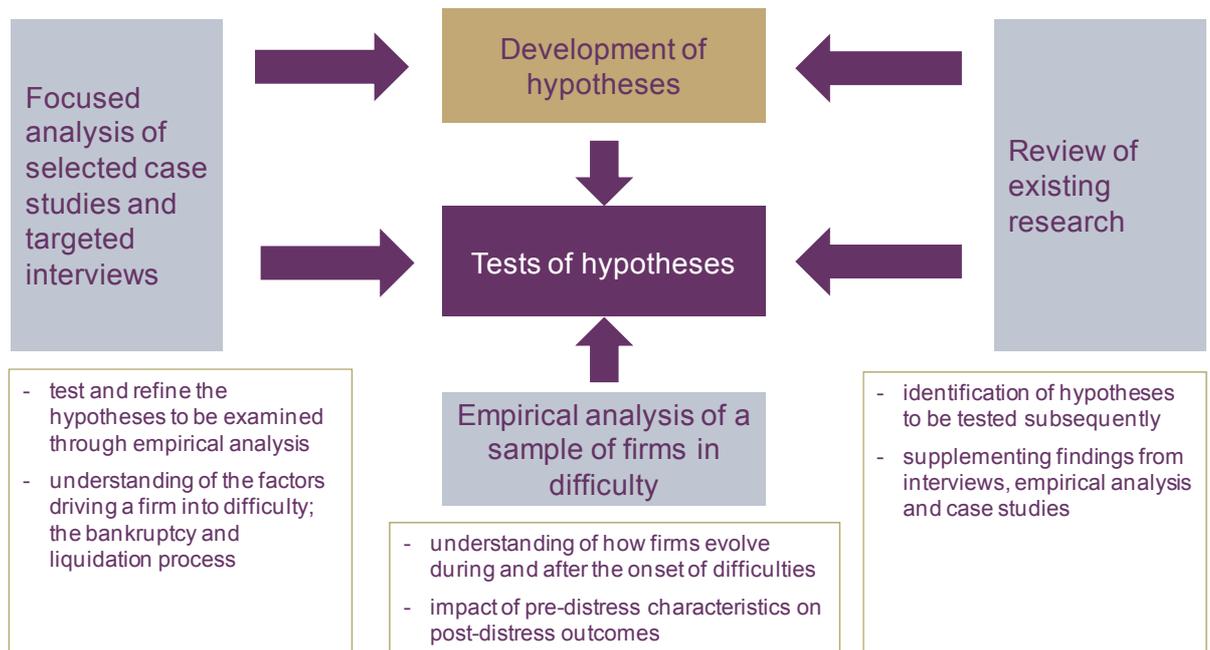
Dependent variables	Independent variables	Hypothesis
Industry-/regional-level employment and output (as separate dependent variables)	Firm characteristics	Certain firm characteristics (eg, size, sector, capital intensity and employee characteristics) are associated with a reduction in industry/regional employment and/or output
	Firm size relative to industry	
	Firm size relative to region	
	Capital intensity (captures various effects, including economies of scale, extent of sunk costs)	
Industry-/regional-level employment and output (as separate dependent variables)	Employee characteristics (for example, average skill level and/or age, where data available)	Certain sector characteristics (eg, overcapacity, falling demand, increasing import penetration) are associated with a reduction in industry/regional employment and/or output
	Presence (or otherwise) of the firm in a cluster of financial distress	
	Sector characteristics	
	Sector's share of regional GDP	
	Market concentration	
	Capacity utilisation rate in the sector	
Industry-/regional-level employment and output (as separate dependent variables)	Industry demand growth	Certain labour market characteristics (eg, higher national unemployment) are associated with a reduction in industry/regional employment and/or output
	Industry profitability	
	Asset substitutability	
Industry-/regional-level employment and output (as separate dependent variables)	Labour market characteristics	For a given industry in a given region, there is an impact on industry/regional output and employment of a cluster of firms in that industry going into distress
	National unemployment rate	
Industry/regional level output and employment	Indicator of labour market flexibility	
	Before and after a period where a cluster of financial distress cases occurs	

Source: Oxera.

3 Methodology for hypotheses testing

To identify the cases and circumstances under which firms in difficulty survive without recourse to restructuring aid, a three-tiered methodology has been adopted. This involves a detailed review of findings from existing empirical studies, case study analysis of firms in difficulty, as well as empirical analysis of a database of firms experiencing difficulties. These findings have been collaborated and verified through a programme of structured interviews with insolvency practitioners across the EU. The findings from the workstreams are used to develop the counterfactual to restructuring aid and implications for the criteria for approval of restructuring aid.

Figure 3.1 Overview of the methodology



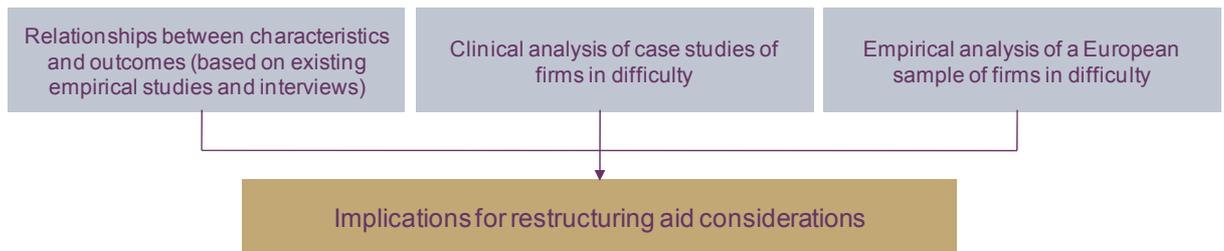
Source: Oxera.

This section describes the overall methodology to examine the Commission’s questions, as set out through the hypotheses developed in section 2.3. It begins with a summary of the overall methodology before looking in detail at the individual workstreams.

3.1 Overview

As a starting point, existing empirical studies have been examined in detail to identify an initial set of relationships between the ex ante characteristics of firms experiencing difficulties and the outcomes in terms of the impact on survival rates, output and employment. This initial set of relationships has then been tested and refined through in-depth empirical analysis of selected case studies of firms experiencing difficulties, as well as empirical analysis of a European-wide sample of firms in difficulty.

Figure 3.2 Implications for restructuring aid considerations



Source: Oxera.

The individual workstreams have been designed to complement each other in terms of providing answers to the questions and hypotheses developed in section 2.3.

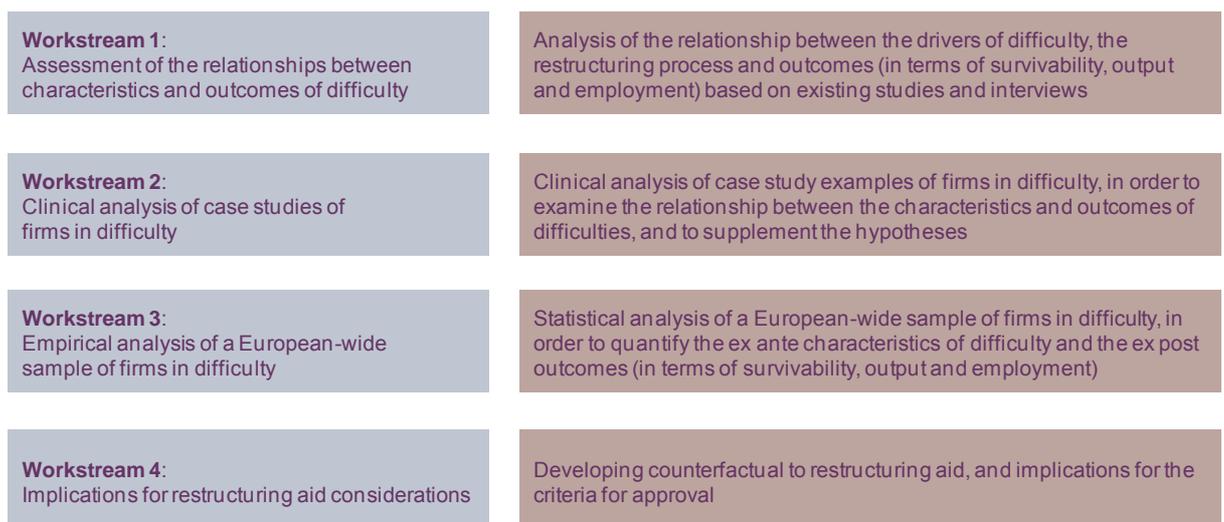
- The case studies provide detailed insights into the process of distress, looking at the reasons, restructuring process and outcomes in terms of any resolution of difficulties, and the implications for output and employment.
- Empirical analysis of a European-wide database of firms experiencing difficulties has been undertaken to quantify the relationship between the characteristics of the firm before the onset of difficulties and outcomes for survival rates, output and employment.

These findings have been collaborated and verified through a programme of structured interviews with insolvency practitioners across the EU.

In addition, the objective of the case studies and empirical analysis is to address any aspects of the hypotheses that have not been directly considered through existing research. For example, existing research and analysis have not examined directly the consequences of certain aspects of the severity of difficulties and the financial structure of a distressed firm on employment and output following the onset of difficulties.

An overview of the individual workstreams is provided in Figure 3.3 and further discussed below.

Figure 3.3 Overview of the workstreams



Source: Oxera.

3.2 Workstream 1: Assessment of the relationships between characteristics and outcomes of difficulty

The objective of this analysis is to define the initial set of hypotheses to be tested in subsequent workstreams and to provide a cross-check on findings from the empirical analysis based on the database of firms in difficulty and the case studies. Findings from existing empirical studies are used to test any hypotheses that cannot be directly examined through the empirical analysis or case studies.

This workstream examines the relationship between the ex ante characteristics of firms in difficulty and the outcomes of difficulty based on the results of empirical research available to date (as well as existing analysis undertaken by third parties), supplemented with discussions with key practitioners and leading academics in this area.

Figure 3.4 Relationship between characteristics of firms in difficulty and outcomes



Source: Oxera.

- **Ex ante characteristics of firms in difficulty.** Characteristics of firms in difficulty prior to the onset of distress have been examined, together with the drivers of difficulty, as these factors will have an impact on the outcomes. For example, distressed firms with a greater proportion of specific assets that cannot be readily transferred to alternative uses may be more likely to reduce output and employment following the onset of difficulties since these firms may be less able to dispose of poorly performing business divisions.
- **Restructuring process.** Given the characteristics of firms in difficulty, the restructuring process, as well as the flexibility of labour legislation, will influence the outcomes. The degree of flexibility in labour market regulations in each jurisdiction will affect the ease with which firms can make workers redundant in response to the onset of difficulties, while insolvency legislation may influence the available restructuring options. For example, the French bankruptcy code provides firms with greater protection from creditors, and may therefore increase the probability that they will restructure rather than be liquidated. In doing so, it emphasises the preservation of the going concern and employment. In contrast, UK insolvency legislation is more protective of creditors, with law-enforcing contracts that are typically more creditor-oriented.⁴⁸
- **Outcomes.** The impact of ex ante characteristics on firms' survival rates has been examined, alongside the effects on employment and output, at the firm, regional and industry level.

The relationships between the characteristics of firms in difficulty and the restructuring process, as well as the impact of distress on outcomes, have been examined based on the evidence from existing research. This ensures an understanding of the context, restructuring process and the setting of difficulty. From this, conclusions have been drawn to inform the relevant hypotheses to be tested through subsequent workstreams (as outlined in sections 3.3 and 3.4).

⁴⁸ In theory, contracts may also be debtor-oriented—for example, covenant-light debt contracts.

A programme of structured interviews with insolvency practitioners across the EU has been undertaken to validate the findings and provide further insights into the relationships between ex ante characteristics and outcomes, and how this may vary across the EU. Through the interviews, the most appropriate examples for the case studies have been identified (see section 3.3).

3.3 Workstream 2: Clinical analysis of case studies of firms in difficulty

Case study examples of firms experiencing difficulties are used to test and refine the relationships between the characteristics of difficulty and the restructuring process on the outcomes identified in the first workstream. The purpose of the case studies is also to develop a detailed understanding of the factors driving a firm into bankruptcy, the bankruptcy and liquidation process, and the associated consequences for survival rates, output and employment. These processes cannot be fully captured through the statistical analysis of the European-wide sample of firms in difficulty.

The adopted methodology is similar to that used in clinical studies, with key observations of the impact on survival rates, output and employment drawn from the case studies. By looking in detail at the processes and developments on a firm-by-firm basis, the causal links and factors that might affect outcomes can be observed and understood. The purpose of the case studies is not to derive generalisations as to what happens in distress, but rather to provide insights into the factors that might be important, and how they translate into outcomes in practice. Thus, the case studies allow an understanding of the longer-term consequences of the insolvency process on output and employment. The factual basis for the analysis of the case studies is based on public domain information only, obtained from press reports and academic studies for example. While Oxera ensured that the facts reported in this study are appropriately sourced, they remain based on secondary sources. This allows us to illustrate the types of factor that may have caused financial difficulties and the possible outcomes associated with the financial difficulties encountered.

Such an approach is consistent with empirical studies that have used case study analysis to provide insights into the characteristics and drivers of difficulty, such as that by Andrade and Kaplan (1998). Weiss and Wruck (1997) also adopted a case study methodology to examine the bankruptcy of Eastern Airlines and the reasons behind its value falling by almost 50% since the start of its difficulties.⁴⁹

In line with the Commission's requirements, the case studies have been chosen to cover a variety of insolvency codes and jurisdictions, and provide the following:

- an assessment of the drivers of difficulty, the bankruptcy and liquidation process, the outcomes of the restructuring process in terms of whether the firm survived, and, where applicable, the form in which the firm survived, and the implications for output and employment;
- a detailed description of stakeholders' actions and positions before the insolvency proceedings and an assessment of the insolvency process, including key legal aspects, allocation of control, and stakeholders' actions once control has been allocated;
- insights into the implications of restructuring at the firm level in terms of business composition, financial position and financing structure, and employment and output;
- insights into the implications of restructuring at the sectoral and industry level, in terms of competition, spillover effects from distress (eg, the impact on suppliers or customers)

⁴⁹ According to Weiss and Wruck (1997), when Eastern Airlines filed for bankruptcy, its value was over \$4 billion. However, during the Chapter 11 process, financial claimants lost an estimated \$2 billion, around half of Eastern's pre-bankruptcy value.

and, critically, employment in both the same industry and other industries in which any relevant skills could be redeployed.

3.4 **Workstream 3: Empirical analysis of a European-wide sample of firms in difficulty**

The empirical analysis tests the hypotheses developed in previous workstreams on a database of a European-wide sample of firms in difficulty, with two objectives: to understand how firms evolve during and after the onset of difficulties; and to examine the relationships between the characteristics of firms in difficulty and the outcomes in terms of firms' survival rates, as well as the implications for output and employment at the firm, regional and industry level.

The empirical analysis examines the factors that are relevant in explaining outcomes in the majority of cases. Given the size of the database of European firms in difficulty, not all firm-specific factors can be considered. Therefore, the empirical analysis focuses on the main drivers of distress. The results from this analysis will apply in a number of cases but not all.

The dataset used for the analysis comprises European firms that meet the Commission's criteria for designation as a 'firm in difficulty'.⁵⁰ These have been supplemented with additional criteria to ensure that the selection process is as robust as possible (see section 4) given that there is no single Community definition of what constitutes a firm in difficulty (as discussed in section 2.3).

The empirical analysis has been undertaken in two stages, as detailed below: the first examines the key trends before and following the onset of difficulties, and the second assesses the empirical links between ex ante characteristics and ex post outcomes.

3.4.1 **Key trends before and following the onset of difficulties**

Characteristics of firms before the onset of difficulties have been examined to ascertain whether certain features of firms' behaviour prior to distress can explain the likelihood of difficulties as well as ex post outcomes. The evolution of the firm during the bankruptcy and restructuring process has subsequently been examined.

Evolution of firms before the onset of difficulties

The evolution of firm-level output and employment before the onset of difficulties has been examined, together with key financial metrics, to provide insight into the relationship between firms' characteristics prior to the onset of difficulties and the subsequent evolution during the process of distress.

Developments following the onset of difficulties

In line with the Commission's requirements, an in-depth analysis of factors that influence survival rates of firms in difficulty has been undertaken. In particular, econometric analysis has been undertaken to identify the factors that influence whether a firm survives either one year or three years after the onset of distress. In addition, the evolution of key financial metrics after the onset of difficulties has been assessed to examine firms' behaviour following the onset of difficulties.

The consequences of the difficulties for output and employment at the firm, industry and regional level have also been examined. The extent to which changes in employment and output at the firm level influence employment and output outcomes at the regional and sectoral level has been assessed. For example, it has been examined whether financial distress tends to be associated with a certain pattern in economic activity outcomes.

⁵⁰ As stated in European Commission (2004b).

3.4.2 Empirical links between ex ante characteristics and ex post outcomes

To examine the hypotheses developed in section 2.3, econometric analysis has been used to identify the factors that influence the change in output and employment at the firm level following the onset of difficulties, as well as factors that affect sectoral and regional outcomes.

Impact on output and employment at the firm level

Econometric analysis has been used to assess the factors that influence the change in firm-level output and employment following the onset of distress compared with the pre-distress situation. For example, among other hypotheses, the econometric analysis examines whether:

- more severe financial distress leads to a greater reduction in firm-level output and employment post-distress;
- more highly geared financial structures lead to a greater reduction in firm-level output and employment post-distress.
- firms that are more profitable prior to distress have more favourable outcomes following distress.

The specification of the econometric models is discussed in further detail in section 5.2.

Impact on output and employment at the regional and industry level

Econometric analysis has also been undertaken to examine the relationship between firm-level outcomes and regional- and industry-level outcomes, as well as the relationship between the occurrence and severity of distress and regional- and industry-level outcomes.

The econometric analysis has therefore examined the factors that may be able to explain the change in output and employment at the regional and industry level. This is because it is expected that regional and sectoral outcomes cannot be fully explained by changes at the firm level.

3.5 Workstream 4: Implications for restructuring aid considerations

Implications for restructuring aid considerations will be drawn from the results of the previous workstreams, and a framework of how to apply the findings from Oxera's study will be set out. As outlined below, this section will identify the key observations and provide guidance on how the results from the different types of analysis might be used by the Commission.

- **Practical implementation of the findings**—the role of the study in informing counterfactual scenarios will be outlined. In line with the Commission's requirements, the objective of this analysis will be to identify the factors and circumstances under which firms in difficulty survive without recourse to restructuring aid. This will take into account the information set that will be available to the Commission at the time the decision needs to be taken whether to approve the restructuring aid.
- **Developing firm-level counterfactuals and industry and regional effects**—a checklist will be provided to the Commission setting out the factors that influence firm-level outcomes as well as the industry and regional effects as part of the counterfactual.
- **Practical considerations for restructuring aid criteria and case practice**—a framework on how to apply Oxera's findings will be set out. This will include an illustration of how to apply the approach to generate a counterfactual, using the ex ante information set that will be available to the Commission at the time the decision needs to be taken on whether to approve restructuring aid.

4 Empirical investigation of consequences of financial distress: data and information sources

4.1 Objectives of the empirical analysis

Empirical analysis is used in this study to gain insights into the development of firms during financial distress, and to examine the ex ante determinants of distress outcomes. In particular, the objectives are to:

- examine developments pre- and post-distress, and to understand in detail the principal hallmarks of distress in the context of real examples. The aim is to provide a detailed understanding of the relationships between the characteristics of firms in difficulty and the outcomes in terms of survival rates, as well as the implications for output and employment;
- test explicitly the principal hypotheses developed in section 2.3.

The empirical analysis consists of an in-depth examination of selected case studies, in addition to empirical tests undertaken on the basis of a European-wide sample of distressed firms.

4.1.1 Hypotheses to be tested using statistical analysis

The evolution of the firm throughout the process of distress has been examined by assessing different metrics of the activity of the distressed firm. This considers whether distressed firms start to reduce employees and output prior to the onset of difficulties and whether firms exhibit an observable deterioration in financial metrics prior to the onset of distress.

Statistical analysis is used, where possible, to quantify key relationships and quantitatively test the hypotheses developed in section 2.3. In terms of model specifications, econometric analysis is possible where the independent variables embedded in the hypotheses meet certain criteria, outlined below.

- **The independent variables should be tangible and quantifiable.** It should be conceptually possible and technically feasible to consistently map all firms in the sample on to a value for the explanatory variable.
- **The conceptual and statistical properties of the independent variables should be analysed in the existing research.** Interpretation of the statistical coefficients yielded by empirical analysis needs to be informed by an understanding of the conceptual behaviour of the independent variables considered, based on available information on the levels and behaviour of such variables in general.
- **Data on the independent variables should be available.** Given that the empirical analysis is performed on a European-wide sample of distressed firms, underlying data for the independent variables is required across a range of firms (for example, across both listed and unlisted firms).

4.1.2 Hypotheses to be tested using case studies

A broad range of aspects of distress can be explored using case studies. In the context of the empirical analysis presented in this report, the analysis of case studies can be used in a number of ways, including: to provide detailed insights into the specific drivers of distress, the nature of the insolvency process and the bankruptcy regime, and interactions with outcomes in terms of output and employment; and to cross-check and expand on the hypotheses

considered by statistical analysis, in addition to providing an in-depth examination of the process of distress.

Case studies are also used, where possible, to explore hypotheses that cannot be tested using statistical analysis, including that creditor structure influences firm-level output/employment following distress; and that the degree of asset substitutability influences firm-level output/employment following distress.

4.1.3 Summary of the hypotheses

This section outlines the hypotheses used to examine the evolution of a firm's behaviour during the onset of difficulties, and the approaches used to test the firm-level hypotheses. The hypotheses discussed below are examined based on the European-wide database of firms in difficulty. Where there is sufficient information available from the case studies, these hypotheses are also considered in the case studies.

The hypotheses relating to the development of firms prior to the onset of distress, outlined in Table 4.1, were designed to test whether certain factors that are typically associated with distress can precede the actual occurrence of distress.

Table 4.1 Hypotheses relating to the development of firms prior to the onset of distress

Principal question	Corresponding hypothesis to be tested
Do the distress criteria employed capture firms before or after they begin to reduce output and employment?	Distressed firms begin reducing employees and output prior to the onset of distress
Do the distress criteria employed capture firms before or after they exhibit deteriorating financial metrics?	Distressed firms exhibit observable deterioration in financial metrics prior to the onset of financial distress Deterioration in distressed firms' financial metrics begins more than one year prior to distress

Source: Oxera analysis.

In addition, certain hypotheses can be formed to examine the evolution of firms after the onset of distress, as outlined in Table 4.2. These are designed to address the principal questions relating to the impact on output and employment at the firm level.

Table 4.2 Hypotheses relating to the development of firms following the onset of distress

Principal question	Corresponding hypothesis to be tested
What is the survival rate of firms following distress?	More than half of firms ultimately cease activities under their legal form as at the point of distress
Does the survival rate of firms in distress vary across sectors and countries?	The rate of survival among distressed firms varies across sectors and countries
How do firm-level output and employment develop following distress?	Firm-level output and employment falls significantly following distress
Does the change in post-distress output and employment vary across sectors and countries?	The extent of changes in firm-level output and employees following distress varies significantly across sectors
At what point do firm-level output and employment reach a minimum, post-distress?	Firm-level employment and output have begun to recover by the third year following distress
At what point (if any) do firm-level output and employment fully recover, post-distress?	Firm-level employment and output have fully recovered by the third year following distress

Source: Oxera analysis.

Table 4.3 maps the hypotheses developed in section 2.3 to the method used in the empirical analysis to test these hypotheses.

Table 4.3 Approach to testing firm-level hypotheses

Hypothesis	To be tested using econometric analysis?	To be explored on the basis of case studies?
Within a given sector and jurisdiction, more severe financial distress leads to greater reduction in firm-level output/employment following the onset of distress	Yes	Case studies used, where possible, to cross-check and expand on econometric analysis
Controlling for the severity of distress, more highly geared financial structures will lead to a greater reduction in firm-level output/employment following the onset of distress	Yes	Case studies used, where possible, to cross-check and expand on econometric analysis
Greater dispersion of creditors reduces firm-level output/employment following bankruptcy	No	Yes
A greater proportion of bank debt in the financial structure leads to smaller reductions in firm-level output/employment following bankruptcy	No	Yes
Firms that enter into formal insolvency proceedings under insolvency regimes that are more costly will be more likely to reduce output/employment following bankruptcy	No	Yes
Each of the aspects of different insolvency regimes has an impact on the reduction in firm-level output/employment after a firm enters into formal bankruptcy. This impact will depend on the firm's financial and creditor structure	No	Yes
Greater asset substitutability (whether a firm's assets can be bought by another company) will lead to smaller reductions in firm-level output/employment following the onset of distress	No	Yes

Source: Oxera.

The observations from the case studies, which are used in a clinical study framework, cannot be said to confirm or reject any of the hypotheses tested because of the lack of statistical power implied by their limited number. Rather, the observations and conclusions drawn from the case studies can suggest that a given hypothesis appears to hold, while providing a detailed understanding at the firm level of the events surrounding each case.

The data used to test the above hypotheses is set out below. Section 4.2 describes the database used for the firm-level empirical analysis, before discussing the criteria that are applied to identify firms in difficulty according to the Commission's guidelines (see section 4.3). The scope and coverage of the European-wide sample of distressed firms used for the firm-level empirical analysis is set out in section 4.4. Following this, the regional and industry-level data sources are discussed in section 4.5, and the section concludes with a discussion of the objectives of the analysis of the case studies of firms in difficulty.

4.2 Firm-level data sources and definitions

4.2.1 Universe of firms

The primary information source for the analysis of firm-level outcomes is the ORBIS database provided by Bureau Van Dijk. A global database covering more than 50m companies, it provides a wide range of financial and other company information.⁵¹ For this study, the ORBIS database has the following advantages over other, comparable, databases:

- it covers all European countries;

⁵¹ Bureau Van Dijk sources the information from a number of information providers in each country.

- it covers all firms (both listed and unlisted) that file annual accounts with a local or national companies register (eg, Companies House);
- the overall sample covers the period from 1995 to 2008 (1999–2008 data is provided online; 1995–2004 data was provided by Bureau Van Dijk on electronic disk); and
- it provides detailed financial and operational data at the firm level.

Databases investigated for the firm-level analysis

A range of potential databases were initially investigated for the firm-level analysis. In addition to ORBIS, the main databases considered as part of the investigations are outlined below.

- **Corporate finance packages such as Bloomberg, Thomson Datastream, Amadeus, Worldscope, Computstat and Dealogic.** These databases contain financial data at the firm level alongside industry and capital market information, together with some operational data. However, restrictions were found on the coverage and availability of data for unlisted firms—for example, Worldscope covers only listed firms and the availability of firm-level data on Bloomberg was found to vary significantly across Member States.
- **National statistics agencies, company registers, industry bodies and regulatory authorities.** A number of information sources, specific to particular Member States were investigated. Both the availability and consistency of firm-level data was found to vary significantly across Member States.
- **Insolvency practitioners.** A number of databases maintained by insolvency practitioners that provide detailed information on the restructuring process were considered. However, owing to the case-by-case nature of these datasets, this source of information was found to be inappropriate for a statistical analysis across Member States. However, similar databases have been used for the case study analysis, as these datasets provide detailed information on the firm-level drivers of distress, the restructuring process as well as the outcomes. (Section 4.6 considers the selection of the case studies.)

As a result of these limitations with alternative databases, ORBIS was selected as the most appropriate database for the purposes of the firm-level analysis.

4.2.2 Data used in the firm-level empirical analysis

To undertake the firm-level empirical analysis, various data series from the ORBIS database have been used. Broadly, this data can be categorised as follows.

- **Sector and country information.** The NACE code (Rev. 1.1) of the companies' main activities was used to allocate companies by sector. The database also provides information on the domicile of companies.
- **Accounting data.** Several sources of accounting data were used to measure the severity of distress and output outcomes; this data includes, for example, shareholder value, revenue, profitability measures (such as net income or earnings before interest and tax, EBIT), and financial metrics such as assets and liabilities.
- **Employee numbers.** The number of employees in each company was used to capture firm-level employment outcomes. These figures may be based on different methodologies used in individual Member States, such as the treatment of part-time workers (which might be counted as full-time-equivalents, or simply reported in terms of the number of contracts). However, since measurement differences are not likely to change over time within Member States, analysis of changes in firm-level employment is likely to be robust against this potential measurement error.

- **Ownership information.** ORBIS provides information on the ownership structure of companies (eg, on direct shareholders) which is used to identify cross-shareholdings and subsidiaries of companies.
- **Macroeconomic and sector-level data.** Data on the prevailing market conditions in different sectors, regions and jurisdictions has been sourced from Eurostat and used to construct control variables in the firm-level analysis (described further in section 5).

4.2.3 Definition of firm ‘survival’

From a conceptual perspective, there are a number of potential benchmarks for determining whether a particular firm has survived. Examples include:

- the **appointment of a liquidator** by creditors or the court, which signals that the firm will eventually cease operations and that its assets will be sold piecemeal. However, even once the decision to liquidate a firm is made, the firm may continue productive activity for some while;
- **physical discontinuation of productive activity**—once the firm has ceased business operations, there will no longer be cash inflows from operating activities. However, such firms may continue to realise gains from sales of assets;
- **removal from the national companies register**—this signals that the firm has ceased to exist as a distinct legal entity. However, the legal status of a firm might not appropriately reflect its economic position;
- **final sale of assets**—from an economic perspective, a firm can be considered to have been fully wound up once all of its assets have been sold. However, practically, it is likely to be difficult to observe sales of individual assets once the firm has ceased operations as a going concern.

It is not clear that any one of these benchmarks constitutes a conceptually and practically superior definition of non-survival. Furthermore, the data collected from ORBIS does not provide a definitive indicator of the legal status of a firm. That is, it is not possible to distinguish between the outcomes described above once a firm has ceased reporting financial data.

Therefore, for the empirical analysis, a firm is considered to have ‘survived’ if it continues reporting financial data until the last year of the period under consideration (as defined in section 5). By definition, these firms will not have been liquidated, and will have continued operations under the same legal entity.

In most jurisdictions, financial reporting is mandatory for firms that are operating as going concerns under normal operating conditions. Hence, firms that cease reporting are likely to include those that:

- have been liquidated;
- are experiencing sufficiently severe financial difficulties that they are exempt from submitting financial data;
- have been acquired and have continued operations under a different legal entity.

Firms that fall under the first two categories can reasonably be considered to no longer exist. Firms that are acquired by another company might be expected to continue operating activities and preserve at least some level of output and employment under a different legal entity. In light of the information constraints outlined above, the results of the empirical analysis pertain to outcomes relating to the original legal entity.

Nonetheless, it is critical to take account of the impact of mergers and acquisitions on outcomes of distress. Where possible, this has been examined for particular firms in the case studies analysis described in sections 5 and 7 (and presented in Appendix A3). However, it is not always practical to examine the impact of mergers and acquisitions on a case-by-case basis. This is because it is not always possible to disentangle the output and employment of the acquired firm/assets from the output and employment of the acquiring firm. In addition, employees and assets may transfer to other firms via a number of mechanisms. For example, in the case of Air Liberté, employees were hired by a competitor (Air France) following the firm's bankruptcy. Such transfers may be difficult to observe and their net impact may be difficult to quantify robustly.

4.3 Criteria for selecting firms in difficulty

4.3.1 Definition of financial difficulty

Financial difficulty is a broad term and is difficult to define rigorously, and, all firms in difficulty (regardless of the reason) could, in principle, be considered. The Commission's criteria for firms in financial difficulty, as stated in the Rescue and Restructuring Aid guidelines, are as follows.

Box 4.1 European Commission criteria for state aid eligibility

The firm must qualify as a firm in difficulty:

- where more than half of the firm's capital has disappeared, and more than a quarter of that capital has been lost over the preceding 12 months;
- where the company fulfils the criteria under domestic legislation for collective insolvency proceedings;
- where, demonstrably, the firm cannot recover through its own resources or with funds from its owners/shareholders or from market sources.

The firm must have been in existence for a minimum of three years.

Source: European Commission (2004b).

The criteria used to identifying firms in difficulty and include them in the empirical sample are as follows.

- **Capital criterion.** In line with the Commission's criterion, a minimum requirement for inclusion in the sample is that the firm has lost 50% of its capital (defined as shareholders' funds) over a particular period, of which 25% must have been lost in the final year of this period. There are two drawbacks to this criterion. It is likely to capture firms whose shareholders' funds have declined for reasons other than distress—for example, dividends paid out of retained earnings will substantially reduce shareholders' funds, but this does not necessarily jeopardise the financial health of the firm. Such dividend payments could also be financed by voluntary disposals of business divisions and assets, which could improve the company's business performance. The second drawback is that this criterion might not capture distress cases where the firm's 'economic' solvency remains intact, but it fails to honour its financial commitments in a timely manner, for example due to poor cash management. The first issue is addressed in the empirical analysis by the imposition of additional selection criteria (discussed below); the second issue cannot be addressed within the Commission's framework for assessing whether a firm is in difficulty.
- **Performance criterion.** To avoid capturing cases where shareholders' funds have fallen for reasons unrelated to financial difficulties (for example, divestiture of assets and

distribution of funds to shareholders), an additional criterion is applied. This corresponds to the ‘usual signs of distress’.⁵² Specifically, firms must have incurred negative net income in the year of distress (defined as the year in which the capital criterion can first be applied to a firm).

4.3.2 Treatment of corporate structures

The ORBIS database provides information about all legal entities that submit financial information to local or national registration bodies, regardless of their status within a corporate group. This implies that some firms in the sample might be subsidiaries of others in the sample, which could lead to double-counting of data if the subsidiary company’s accounts are consolidated (even partly) in the parent company’s accounts, and both companies are included in the sample of distress firms. Such double-counting is likely to lead to over-representation of particular types of firm, and may bias the statistical tests if these firms are systematically different from the sample as a whole.

To avoid such double-counting, these companies are identified and excluded from the sample using ownership data from ORBIS as follows:

- **identification of largest owner**—the largest owner of each firm prior to distress is identified (based on the ownership structure as at the year of distress, or the latest available pre-distress year). The largest owner is defined as the parent company with the greatest equity stake or proportion of voting rights (whichever is higher);
- **matching to firms in the database**—the identified parent companies are matched using their Bureau Van Dijk identification numbers to the firms in the sample;
- **exclusion of subsidiaries**—where a parent company is matched to a firm in the sample, the subsidiary company is excluded, while the identified parent company is retained in the sample.

4.3.3 Exclusion of recipients of rescue and restructuring aid

Firms that had previously applied for, or received, aid during the 1999–2008 period are excluded from the sample. The list of rescue and restructuring aid cases in the countries under consideration has been derived from European Commission’s website and matched to the ORBIS database using a text search based on the company names.

4.3.4 Data adequacy criteria

To be for the sample, a distressed firm must meet a number of data adequacy criteria to ensure compliance with the Rescue and Restructuring Aid guidelines, and to minimise statistical distortions in the empirical analysis.

Compliance with Rescue and Restructuring Aid guidelines

Firms that have been in existence for less than three years are not generally eligible for rescue and restructuring aid, as outlined in the Commission’s guidelines.

Box 4.2 Rescue and Restructuring Aid guidelines: minimum age criteria

For the purposes of these Guidelines, a newly created firm is not eligible for rescue or restructuring aid even if its initial financial position is insecure. This is the case, for instance, where a new firm emerges from the liquidation of a previous firm or merely takes over such firm’s assets. A firm will in principle be considered as newly created for the first three years following the start of operations in the relevant field of activity. Only after that period will it become eligible for rescue or restructuring aid.

Source: European Commission (2004b).

⁵² See European Commission (2004b), para 12.

Therefore, to qualify for inclusion in the sample, firms must report at least three years of data prior to the year of distress.

In addition to ensuring that the sample reflects an adequate counterfactual for Rescue and Restructuring Aid,⁵³ this requirement ensures that firms in the sample have sufficient pre-distress data to allow for a meaningful comparison between key variables pre- and post-distress. Furthermore, it might be reasonable to expect that, three years prior to distress, the key output variables only minimally reflect the temporary effects associated with the onset of distress. These variables can therefore be usefully benchmarked against their pre-distress values when comparing developments following distress.

Additional data adequacy requirements

In addition to the data adequacy criteria specified in the Rescue and Restructuring Aid guidelines, the following criteria are applied to ensure the robustness of the empirical analysis/

- **Firms must have encountered difficulties prior to 2006**—this criterion is applied to ensure that there are at least three years between the first year of distress and the end of the period under consideration (2008) for all firms in the sample.⁵⁴ This enables an analysis of longer-term outcomes of distress.
- **All surviving firms must report continuous data up to 2008**—firms that report intermittent financial data are excluded to ensure consistency of the sample across all years.⁵⁵
- **All non-surviving firms must report continuous data up to the year of exit from the sample**—as with surviving firms, non-surviving firms that report intermittent data before the last year of reporting are excluded.
- **All firms must be assignable to a sector category**—in order to facilitate analysis of sector-level influences on firm-level outcomes of distress, each firm must be grouped into a particular sector classification.

4.3.5 Outlier checks

A number of data checks are performed to exclude anomalous observations from the sample.

- **Negative values**—firms that report negative values for revenue, employment or assets are excluded.
- **Implausibly high values**—firms that report absolute values for financial variables that are implausibly large are excluded. Implausible values are considered to be those that are greater than the corresponding values for the 25 largest companies in the world according to the Forbes ‘Global 2000’ listing.⁵⁶

⁵³ Firms that have been in operation for less than three years when they enter into difficulty are addressed under state aid legislation that is separate from rescue and restructuring aid.

⁵⁴ For the purposes of the statistical analysis, the first year of distress is considered to be the first year in which the firm meets both the capital and performance criteria.

⁵⁵ Certain firms in the sample were operating as a going concern in 2007 but have yet to report their 2008 financial results. Based on the aforementioned definition of survival, firms must report three years of post-distress data in order to be classified as surviving firms. In particular, firms that went into distress in 2005 and did not report financial data in 2008 cannot be treated as surviving. On the other hand, this set of firms includes going concerns, which are likely to have significantly different characteristics from non-surviving firms and would bias the statistical analysis if they were treated as non-surviving firms. To address this issue, a proportion of firms that went into distress in 2005, but did not report data in 2008, are retained in the sample. These retained firms constitute those that report the poorest profitability ratios in the year of distress (ie, those that would be most likely to exit the sample); these firms are assumed to be non-surviving. The remainder of these firms are assumed to be going concerns that report inadequate data, and hence are excluded from the analysis.

⁵⁶ http://www.forbes.com/lists/2009/18/global-09_The-Global-2000_Rank.html

- **Implausible year-on-year changes**—firms that report year-on-year changes in financial variables that are implausibly high are excluded. Specifically, firms that exhibit absolute year-on-year changes in any variable that are greater than 10,000% are excluded.
- **Companies with continually growing revenues**—companies that exhibit revenue growth of 200% both over the period three years prior to distress and the period three years following distress are excluded. These firms are unlikely to represent firms that have encountered financial difficulties, since their business operations have continued to grow throughout the relevant period.
- **Statistical outliers**—in the context of the specification of the econometric models described in section 5.5, statistical outlier tests are carried out for each regression to remove the impact of outlying observations on the results.⁵⁷

4.4 Scope and coverage of the firm-level empirical analysis

The final sample that is used for the firm-level empirical analysis consists of 1,370 distressed firms, after application of the selection criteria discussed previously. This section discusses the coverage of jurisdictions, sectors and firm size categories in the final sample for the purposes of the firm-level analysis.

4.4.1 Geographic coverage

In line with the remit of the Commission's policy on restructuring aid, the geographical focus of the empirical analysis is the 27 EU Member States. The objectives for this analysis (as set out by the Commission) state that the analysis should take into account a broad range of Member States, including:

Member States with different traditions in terms of granting restructuring aid, including small and big EU Member States, 'old' and 'new' Member States, and Member States with different labour market specificities.⁵⁸

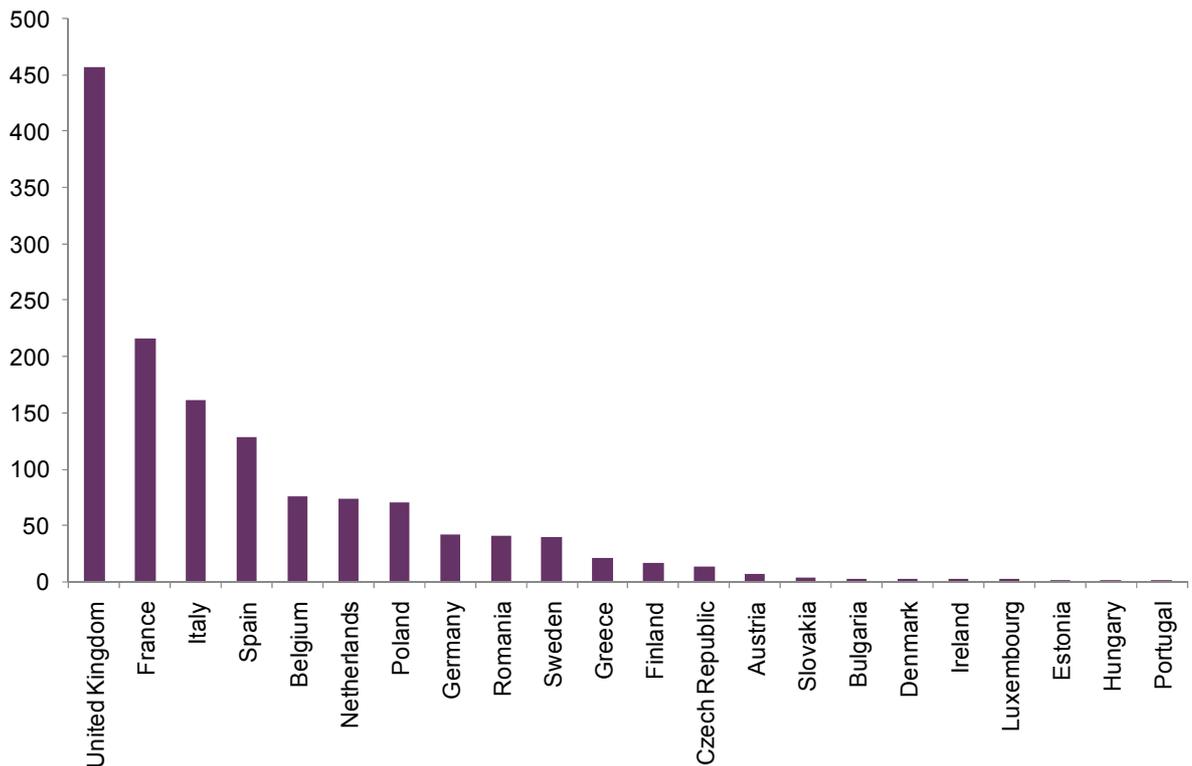
The ORBIS database maps firms to their country of domicile according to the location of the firm's registered office or headquarters. Given that a firm may have subsidiary operations in several countries, it is likely that firms in the sample under consideration may produce output and employ workers in locations outside of their recorded country of domicile.

Firms are drawn from all 27 EU Member States. Figure 4.1 shows the number of firms in the final sample that are domiciled within each of these Member States.

⁵⁷ Outliers are identified using the 'Cook's D' measure of statistical distance.

⁵⁸ European Commission (2008b), p. 3.

Figure 4.1 Number of distressed firms in the final sample, by country



Note: Although firms are initially drawn from all 27 Member States, there are no firms in the final sample that are domiciled in five countries (Cyprus, Latvia, Lithuania, Malta and Slovenia). This is due to exclusions based on the selection criteria outlined previously.

Source: Oxera calculations, based on the ORBIS dataset.

The final sample includes a relatively large number of firms from the UK, and to a lesser extent, France and Italy. There are also a relatively small number of firms included in the sample that are domiciled in certain Member States (particularly ‘new’ Member States such as Hungary and Latvia). This is likely to be due to a combination of three factors:

- **variations in the overall number of active firms.** There are likely to be fewer active firms in, for example, smaller Member States;
- **size distribution of firms.** In some Member States, the distribution of firms in terms of size is such that there is a relatively small number of firms above the size threshold employed in the current analysis;
- **data availability.** There is also substantial variation across Member States in terms of reporting requirements and regulations relating to publicly available firm-level financial data, and in terms of coverage of particular Member States by the main data providers to Bureau Van Dijk.

To address the relatively large proportion of firms domiciled in certain countries (particularly the UK), statistical analysis is carried out based on a weighted sample. Specifically, observations are weighted according to the ratio of the country of domicile’s GDP to the number of firms in the sample domiciled in that country. This ensures that countries are represented in line with their economic size (see section 5 for further discussion).

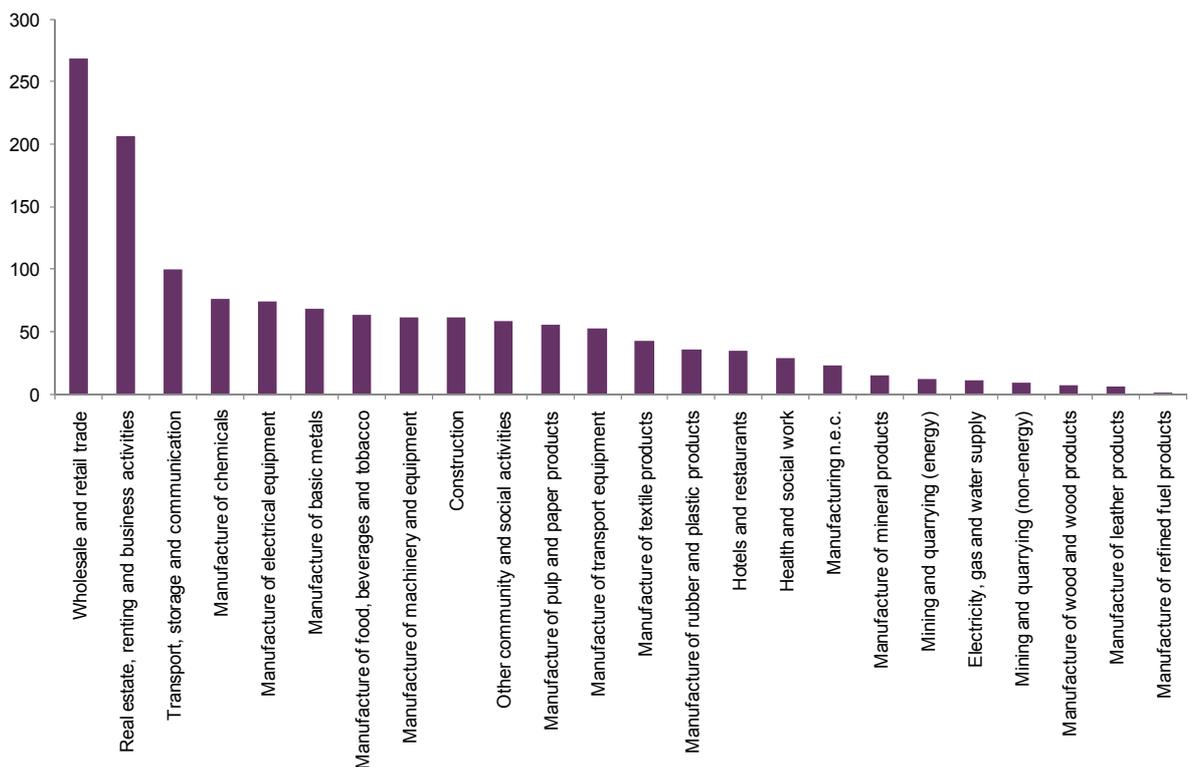
4.4.2 Sector coverage

The sector classification system used in the context of the empirical analysis is the NACE.⁵⁹ There have been several versions of the NACE classification system over the past three decades. The version used in the context of the empirical analysis is NACE Rev 1.1, developed by Eurostat in conjunction with representatives of the Member States.

This classification system has a number of advantages for this study:

- **comparability across Member States**—the NACE system was designed with the explicit intention of grouping European firms from different Member States according to their economic activity;
- **compatibility with existing rescue and restructuring aid cases**—existing restructuring aid cases are grouped according to this version of the NACE code;
- **ability to group firms at various levels of aggregation**—all NACE systems, by their nature, allow for the grouping of firms by broad or narrow levels of economic activity. This allows for flexibility when analysing the different sectors;
- **availability of NACE classification on ORBIS**—the NACE Rev 1.1 version is available for nearly all firms listed in the ORBIS database.

Figure 4.2 Number of distressed firms in the sample, by sector



Source: Oxera's calculations, based on the ORBIS dataset.

⁵⁹ NACE (Nomenclature générale des activités économiques dans les Communautés Européennes) is the European standard classification of productive economic activities. A hierarchical structure, it comprises four levels: headings identified by an alphabetical code (sections); headings identified by a two-digit numerical code (divisions); headings identified by a three-digit numerical code (groups); headings identified by a four-digit numerical code (classes)

4.5 Coverage of financial services companies

The financial services sector is important in the context of state aid because:

- state aid is likely to be a key policy area in this sector going forward;
- there is considerable precedent of Member States granting (and the Commission approving) rescue and restructuring aid to firms in this sector.

Due to the unique characteristics of this sector, financial firms would need to be considered separately from the rest of the sample, for a number of reasons, as discussed below.

- **Interdependency of financial system.** In general, when a firm that is active in a particular market fails and exits the market, other firms operating in that market benefit due to increased demand for their products. In the financial services sector, this effect is also likely to apply. However, as major financial services providers frequently act as financial counterparties to each other (eg, lending and borrowing funds, or acting as a party to derivative contracts), this implies that many financial institutions, in their capacity as creditors to the failed company, stand to lose from the insolvency of a peer.

In the context of the banking sector, this effect is exacerbated by the importance of confidence. Depositor panics triggered by one financial failure can have serious consequences for all other financial institutions (contagion). Therefore, the industry impact of, for example, a banking failure is likely to be substantially different from that of distress of a non-financial firm, thus meriting separate attention.

- **Nature of spillovers to the real economy.** The regional effects of the failure of a financial institution may also be different from those of a non-financial institution. The financial services sector plays a crucial role in the economy as a whole, such that problems in the banking system can have far larger impacts on the overall level of economic activity in a Member State than the failure of non-financial institutions.
- **Accounting differences.** Certain accounting items used to construct measures of financial distress and other variables in the empirical analysis cannot be applied to financial institutions. For example, interest coverage ratios (see sections 5.1 and 5.2) do not have the same interpretation for financials, and some accounting items (such as EBIT) are not reported under financial reporting standards.

4.5.1 Coverage of firm size categories

The objectives of this project include an examination of some medium-sized enterprises, while the majority of the companies in the sample are large corporations. Table 4.4 reproduces the Commission's criteria for medium-sized and large firms as stated in the Guidelines for Restructuring Aid for SMEs,⁶⁰ and compares this against the criteria applied in the context of the empirical analysis.

The criteria used for selecting firms in difficulty for inclusion in the sample stipulate companies with more than €50m turnover *or* more than €43m in assets, but not necessarily both. The criteria also allow for the selection of both large and medium-sized firms, while ensuring that larger firms are more likely to be included than medium-sized firms.⁶¹

⁶⁰ European Commission (2003).

⁶¹ Since a proportion of medium-sized firms would not meet the criteria, while all large firms will, by definition, meet the criteria.

Table 4.4 Firm size criteria

Commission definitions	<p>Medium-sized firm: <250 employees and >€50m turnover or >€43m balance sheet total</p> <p>Large firm: Either has >250 employees or <€50m turnover and <€43m balance sheet total</p>
Criteria applied for the purposes of the empirical analysis	>250 employees or >€50m turnover or >€43m balance sheet total at any point in time for which data is available

Source: European Commission website, and Oxera analysis.

4.6 Regional-/industry-level data sources and collection

A number of datasets are used to construct the database for the regional- and industry-level empirical analysis, including the following:

- **ORBIS database**—this provides the firm-level accounting and financial information. Although ORBIS includes information on employment levels at firms, it does not contain information on the location of the job losses;
- **ERM**—this contains information on redundancies that are publicised across the EU. Importantly, this database contains information on the location of the job losses;
- **Eurostat**—this provides regional- and industry-level employment and output data at different levels of aggregation across Member States.⁶²

An overview of the variables that are employed in the regional and industry-level empirical analysis is provided in Table 4.5.

⁶² In a number of cases, national statistical offices were found to provide regional and sectoral employment data at a more detailed level than Eurostat. However, Eurostat was used for the purposes of the empirical analysis owing to its standardised methodology used to collect data and the consistency of information across Member States.

Table 4.5 Variables used in the regional and industry level empirical analysis

Variable	Source
Redundancies	
Redundancies at the establishments	European Restructuring Monitor
Employment	
Sectoral employment within regions (5 industries)	Eurostat
Sectoral employment at the national level (60 industries)	Eurostat
Output	
Sectoral GVA within regions (5 industry aggregates)	Eurostat
Sectoral GVA at the national level (60 industries)	Eurostat
Firm and sector characteristics	
Capacity utilisation	Eurostat
Labour productivity within sectors and countries	Oxera calculations, based on Eurostat data
Economy and sector performance	
GDP growth	Oxera calculations, based on Eurostat data
GVA growth	Oxera calculations, based on Eurostat data
Workforce and labour market characteristics	
Strictness of employment protection legislation	OECD

Source: Oxera.

4.6.1 Databases investigated for the regional and industry-level analysis

A number of alternative databases were initially considered, including the availability of datasets that track displaced workers over time, together with labour market statistics provided by individual Member States.

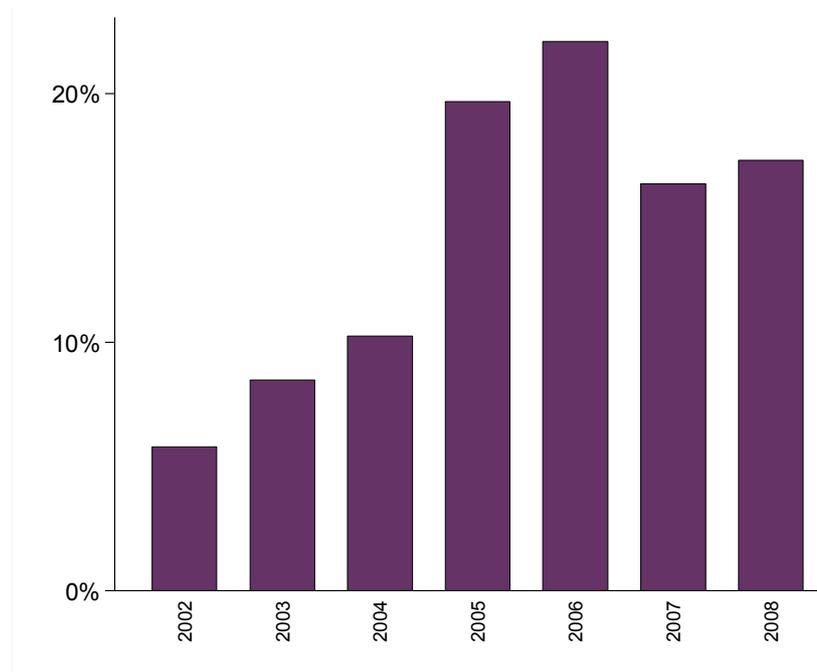
- **Linked employer–employee datasets**—these map labour markets through flows of employees and employers to enable employees’ employment histories to be traced after displacement. Such datasets are provided by some Member States (eg, Statistics Norway provides a comprehensive linked employer–employee dataset). However, these datasets are collated by different methodologies and appear to have only limited coverage across Member States.
- **Employment cells**—the availability of information tracking displaced workers after the closure of an establishment was investigated. However, as this information is only available on a case-by-case basis, these datasets were found not to be appropriate for an empirical analysis across Member States.
- **International organisations, national statistics agencies and national employment agencies.** A number of alternative information sources provided by individual Member States were considered. Typically, the information available (eg, NOMIS data for UK and BA for Germany) was less detailed than required for the purposes of a in-depth empirical analysis, and the individual data sources were found not to be fully consistent across Member States.

As a result of the above limitations with alternative data sources, the combination of ORBIS, the European Restructuring Monitor and Eurostat was found to provide the most consistent data across individual Member States for the empirical analysis.

4.6.2 Establishment-level data on redundancies

The ERM provides data on the number of employees made redundant at the distressed firm, and, for a large number of cases, at the establishment level. ERM has monitored restructuring activities in Europe and their employment effects since 2002—restructuring cases and employment effects are collated through a press review of daily newspapers and business press by a network of correspondents across the EU. The main body of cases has been recorded on ERM from 2005 (as shown in Figure 4.3).

Figure 4.3 Percentage of restructuring cases recorded in ERM by year



Source: Oxera based on ERM data.

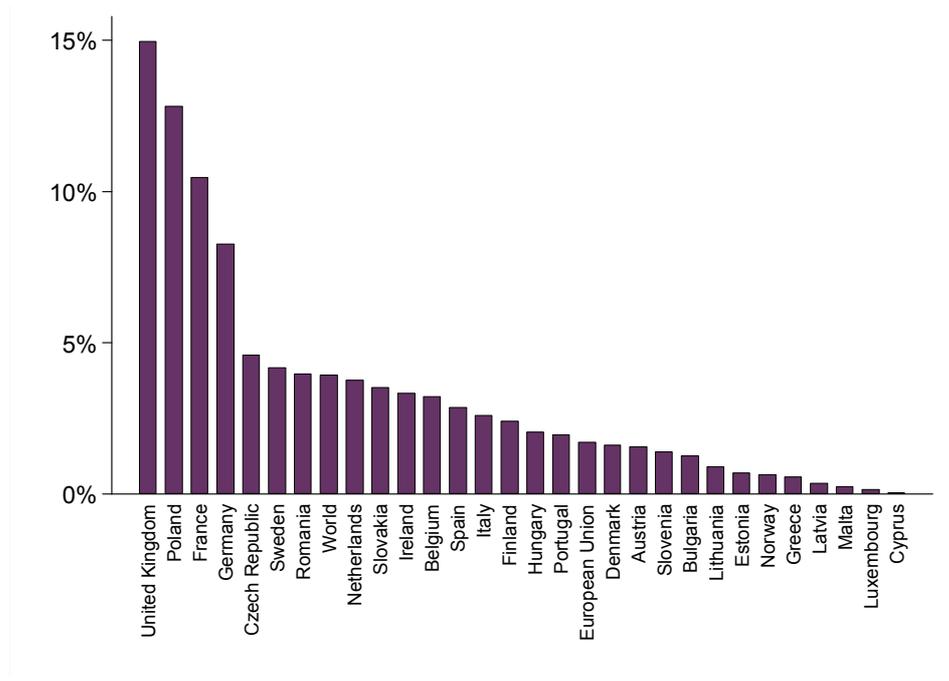
The ERM records restructuring cases that:⁶³

- affect at least one EU country;
- entail an announced or actual reduction of at least 100 jobs;
- involve sites employing more than 250 people and affecting more than 10% of the workforce; or
- create at least 100 jobs.

The dataset covers a broad range of countries with a focus on cases from the UK, Poland, France and Germany (see Figure 4.5).

⁶³ <http://www.eurofound.europa.eu/emcc/erm/info.htm>.

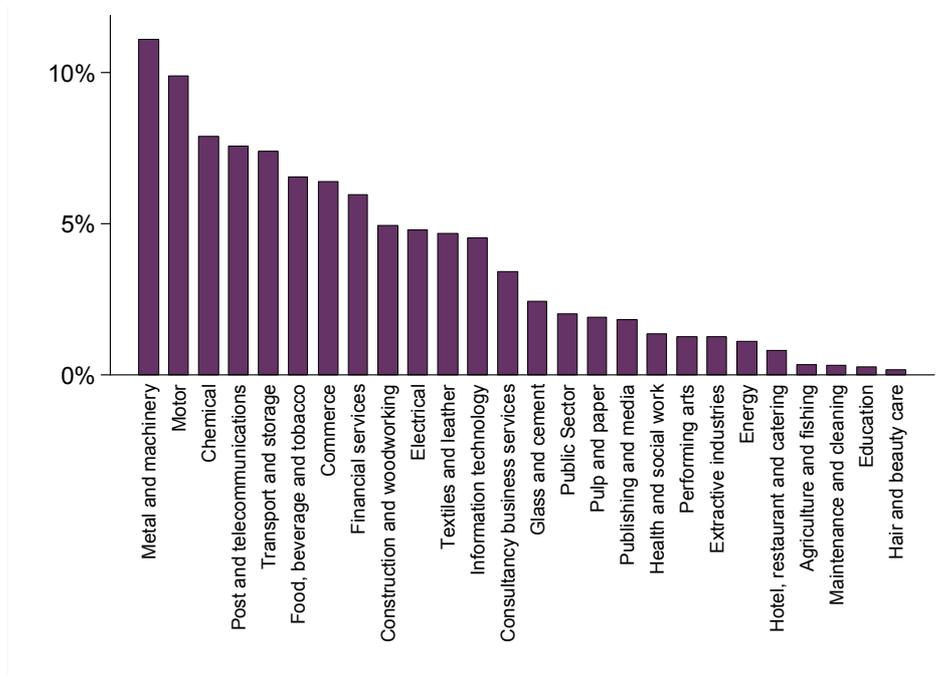
Figure 4.4 Percentage of restructuring cases recorded in ERM by country



Source: Oxera based on ERM data.

There is some variation in restructuring cases recorded on ERM by sector, as shown in Figure 4.5, with a higher proportion of cases from construction and manufacturing than the services sector.

Figure 4.5 Percentage of restructuring cases recorded in ERM by sector



Source: Oxera based on ERM data.

4.6.3 Regional and industry level employment and output data

Sectoral employment and output data

Eurostat regional and industry level data on output and employment is collated on the basis of regional units classified according to the nomenclature d'unités territoriales statistiques (NUTS). There are three main levels of NUTS classifications, delineated in terms of population.

Table 4.6 NUTS classifications

	NUTS level 1	NUTS level 2	NUTS level 3
Minimum population to qualify for level ('000s)	3,000	800	150
Maximum population permitted for level ('000s)	7,000	3,000	800
Average (EU27) population by level ('000s)	5,081	1,819	378

Source: Eurostat.

Eurostat provides regional employment and output (GVA) data by industry. Annual data on employment is provided between 1999 and 2008, with GVA data between 1995 and 2006.⁶⁴ Regional granularity is given at the national level and at NUTS levels 1 and 2 for employment; and 1, 2 and 3 for GVA.

Regional employment and output data by industry is provided by Eurostat for the eight groups of first-level NACE categories shown below.

Table 4.7 Regional employment by industry

NACE code	Sector
A, B	Agriculture, hunting, forestry and fishing
C, D, E (employment only)	Total industry (excluding construction)
C, E (output only)	Total industry (excluding manufacturing and construction)
C–F	Industry
F	Construction
G, H, I	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants; transport; storage; communication
G–Q	Services
J, K	Financial intermediation; real estate; renting; business activities
L–Q	Public administration and defence; compulsory social security; education; health and social work; other community, social and personal service activities

Source: Eurostat

Sectoral employment and output data at the national level

Employment and output (GVA) data at a highly disaggregate classification of industry sectors (60 industries) is also provided by Eurostat. However, this data does not cover all countries—for example, no employment data is provided for Austria and the UK and no output data is available for Ireland.

⁶⁴ Eurostat also provides data on regional employment by activity for 1983 to 2001. This data, however, was collated under a different methodology and so issues relating to data comparability may arise. Only the dataset from 1999 to 2001 is used in the analysis of regional and industry effects.

4.6.4 Firm and sector characteristics

Data on capacity utilisation and labour productivity is obtained from Eurostat.

- Data on capacity utilisation is provided by Eurostat for the manufacturing industry on a quarterly basis. The data is collected through business surveys.
- Labour productivity within sectors and countries. This is calculated as GVA relative to the number of employees for each sector within each region, based on data available from Eurostat.

4.6.5 Economy and sector performance

National growth rates in output have been calculated from annual data on GDP and GVA at the national level provided by Eurostat.

4.6.6 Workforce and labour market characteristics

Strictness of employment protection legislation

The OECD provides an index to assess the strictness of employment protection legislation across various jurisdictions. For each country, employment protection legislation is assessed according to 18 basic dimensions, covering three main areas: employment protection of regular workers against individual dismissal; specific requirements for collective dismissals; and regulation of temporary forms of employment.

4.7 Selected case studies of firms in financial distress

The data sources and data collection techniques for the case studies differ from those used in the empirical analysis. The empirical analysis of selected case studies provides further insight into the hypotheses developed in section 2.3, and provides more detail about the drivers of financial distress and the bankruptcy and insolvency process. This may be informative in understanding the interactions between the bankruptcy and restructuring process and possible outcomes in terms of the survival rate of firms, as well as the implications for output and employment, at the firm, regional and sectoral level.

4.7.1 Methodology in selecting case studies

This section discusses the methodology used to select case studies of European firms that have experienced difficulties to ensure fully representative coverage across bankruptcy scenarios, jurisdictions and sectors. A number of methods have been considered.

- **Cases from insolvency practitioners.** A number of cases were selected on the basis of company names obtained from insolvency practitioners. A shortlist was then drawn up using the scope criteria (company size, year of difficulty). Having undergone formal bankruptcy proceedings, all of these cases fulfilled the difficulty criteria (see section 4.3 for details). A final filter was undertaken to exclude any firms that were previously considered for rescue and restructuring aid, as well as subsidiaries that were small or non-core to the parent company's business.
- **ERM database.** Another set of case studies were selected based on information from the ERM database, which lists all major documented changes in firm employment (in cases of both increases and decreases). From a list of cases where significant employment reductions were observed, the final case studies were selected based on the scope and difficulty criteria detailed in section 4.4.

- **Creditreform reports.** Potential case study candidates were selected from cases listed in Creditreform Economic Research Unit reports. These reports provided lists of the largest insolvencies in Europe for 2001 and 2002.⁶⁵
- **Credit ratings.** Another list of potential case study subjects was sourced from companies whose credit rating was downgraded from B or above to C or below (according to Bloomberg data). For a given firm, a credit rating downgrade may indicate a deteriorating financial position or outlook for the firm. A rating of C is assigned to obligations that are highly vulnerable to non-payment, but that have not been subject to payment default.⁶⁶ Obligations that are subject to payment default are assigned a credit rating of D.⁶⁷ Therefore, credit rating downgrades can be used as one method to identify firms that may be deemed to be in difficulty, under the scope of this study.

All shortlisted cases were then checked for consistency within the terms of the scope of the study, as described in sections 4.2 and 4.4.

4.7.2 Coverage of the case studies

Case studies were selected to ensure fully representative coverage across bankruptcy scenarios, jurisdictions and sectors. Because it is impractical to cover all jurisdiction-sector pairs by analysing case studies, cases were selected to ensure coverage of a cross-section of companies, according to the following criteria.

- **Bankruptcy types**—selected cases cover various forms of bankruptcy, including informal restructuring (eg, agreement with creditors without recourse to court) and formal restructuring (eg, receivership, liquidation or court-supervised negotiations with creditors).
- **Jurisdiction**—cases include firms based in Member States across a range of European countries, in order to capture differences in outcomes that may be partly explained as a result of differences in labour market specificities and insolvency laws. The case studies in this report aim to highlight which of these characteristics, if any, influence the outcomes of difficulty for a given firm. Where possible, the conclusions drawn from cases in the various jurisdictions will be compared and contrasted, as applicable.
- **Sector**—cases have been selected to cover, to the extent possible, a variety of sectors, including overcapacity, high growth and mature industries, with the aim to highlight the sensitivity of firms in different sectors to industry conditions in order to provide important insights when assessing the relationship between drivers of distress and outcomes, in terms of employment and output.

⁶⁵ Creditreform Economic Research Unit (2002 and 2003).

⁶⁶ This includes obligations of an issuer that is the subject of a bankruptcy procedure, but which has not yet defaulted on any payment. Securities on which payments have been suspended, within the terms of the instrument, may also be assigned a C rating. S&P (2008).

⁶⁷ S&P (2008).

5 Implications of financial distress for firm-level output and employment based on empirical analysis

5.1 Overview

This section evaluates the factors that can explain the outcomes of distress on the basis of empirical analysis. This analysis is based on a sample of more than 1,000 European firms that have found themselves in financial difficulty, as well as a more in-depth analysis of a selection of case study examples of firms in distress.

A policy-maker confronted with a rescue and restructuring aid case is likely to have access to several categories of information, including:

- historical and current information about the firm, sector and economy;
- information about future observations (including observations relating to the performance of the economy or sector following distress); and
- information on factors specific to a particular case.

This analysis uses the first two of these categories to inform how firms in a similar position in the past have evolved since the onset of distress and which factors can systematically explain the outcomes of distress in terms of output and employment at the firm level. From this, a more robust counterfactual scenario can be constructed and the expectations embedded in these scenarios can be tested.

The empirical analysis is carried out in two stages.

- Key trends before, during, and after the distress have been examined to understand how firms develop after the onset of distress, and how this is related to their business and financial performance before the distress.
- Using econometric analysis, the empirical relationship is explored between firms' characteristics and the market ex ante and the outcomes of distress.

Sections 5.2 to 5.4 looks at firms' performance over the period before and after the onset of distress, and section 5.5 describes the statistical tests undertaken to identify the impact of financial distress on output and employment. The results from these tests are then reported in sections 5.6 to 5.8, which consider in turn the factors that influence whether the firm survives, the implications of distress for output (as measured by revenue), and the implications of distress for employment.

Further insights into the impact of distress on employment and output have been gained from the analysis of selected case studies on a firm-by-firm basis, the findings of which are outlined in section 5.9.

5.2 Firm performance prior to distress

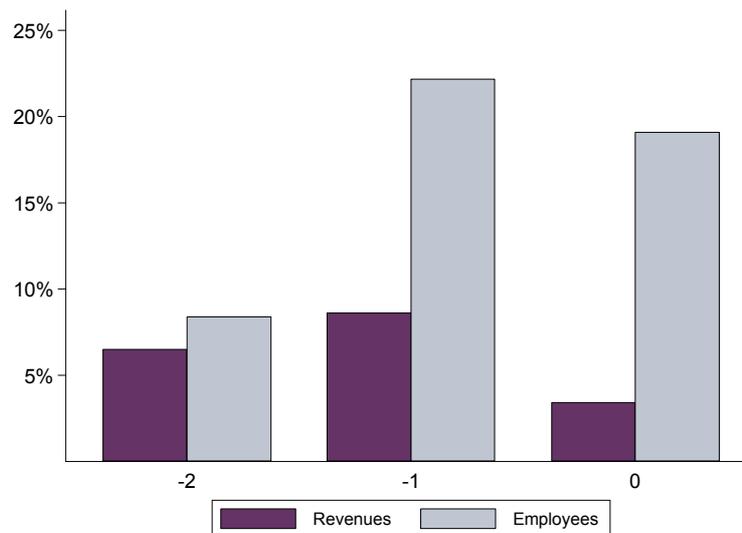
Box 5.1 Key observations from the empirical analysis

- Prior to financial difficulty, employment increases substantially, while revenues increase slightly, suggesting expansion of activity in the period leading to distress, followed by a sharp fall in revenues and employment in the year of distress and signs of accelerated deterioration in financial health.
- Gradually deteriorating financial health over the period prior to distress culminates in a relatively sharp deterioration in the financial position of the firm, as reflected in changes in a number of financial metrics over the year immediately prior to distress.
- While all firms exhibit a significant deterioration in financial performance in the years prior to distress, the manufacturing sector, as well as the public, education and defence sectors, display the most significant deterioration.

5.2.1 Evolution of firm's revenues and employment prior to distress

In the period before the onset of financial distress, employment and revenues increase, suggesting a rapid expansion in the firm's activities in the years prior to distress. In the year before the onset of distress (ie, year $t - 1$, as shown in Figure 5.1), employment has increased by 22% and revenues by 8%, on average, compared with the three years prior to distress.

Figure 5.1 Development of revenues and employment prior to distress for all firms (% change relative to the third year prior to distress)



Note: The mean levels of revenues and employees are reported.
Source: Oxera analysis, based on Bureau Van Dijk data.

5.2.2 Financial performance metrics

Tables 5.1 to 5.3 illustrate the development of a firm's financial position prior to distress, as reflected in several financial metrics. Across all these metrics, there is a marked deterioration in financial performance. The profitability metrics, which proxy the ability of firms to generate cash, exhibit a general decline over the three years prior to distress.

Table 5.1 Profitability ratios for firms in financial difficulty prior to distress

Indicator		N	T - 3	T - 2	T - 1	T 0
Net income to assets						
Net income/book value of assets	Mean	1,370	0.01	0.00	-0.02	-0.17
	Median	1,370	0.01	0.01	-0.01	-0.11
EBIT to assets						
EBIT/book value of assets	Mean	1,370	0.04	0.02	-0.01	-0.11
	Median	1,370	0.03	0.03	0.01	-0.07
Return on sales						
EBIT/revenue	Mean	1,370	0.01	0.00	-0.03	-0.10
	Median	1,370	0.02	0.02	0.00	-0.04

Note: For example, 0.01 indicates 1% net return on assets for (net Income/book value of assets).
Source: Oxera analysis, based on Bureau Van Dijk data.

This deterioration in the financial metrics suggests that while firms continue to grow or even accelerate their expansion before distress, their financial performance (profitability) deteriorates in the years prior to distress. Existing empirical studies suggest that 'economic' distress is typically a key driver of 'financial' distress—ie, liquidity shortages and difficulties meeting financial obligations (see, for example, Davydenko, 2009). To the extent that financial metrics reflect economic distress (underperformance of the business), the results confirm that the firm's performance, especially in terms of the bottom line, deteriorates one to two years before financial distress (ie, before the firm encounters difficulties in meeting its financial obligations).

The combination of rapidly increasing employment, increasing output and declining business (financial) performance indicates that distressed firms might have been expanding into less profitable activities, or investing in projects with low or negative net present value (ie, over-expanding) prior to distress. This suggests that a key driver of financial distress is miscalculation or inefficiency on the part of management.

Some firms that ultimately find themselves in financial difficulty might have been expanding prior to distress to capture new markets that ultimately failed to materialise. Telewest, for example, attempted unsuccessfully to capture market share in an intensely competitive market environment. The consequence was rapid initial growth in revenues accompanied by deterioration in profitability (see section 5.9).

The decline in performance can also be seen in the ratios that reflect firms' ability to service their outstanding liabilities (see Table 5.2).⁶⁸

Table 5.2 Evolution of cash flow available for debt service ratios prior to distress

		N	T - 3	T - 2	T - 1	T 0
Cash flow to debt						
EBIT/(book value of liabilities excluding shareholders' capital)	Mean	1,370	0.05	0.03	-0.02	-0.12
	Median	1,370	0.05	0.03	0.01	-0.07

Source: Oxera analysis, based on Bureau Van Dijk data.

⁶⁸ Liabilities are defined as the book value of assets less the book value of shareholders' funds. Market values of liabilities have not been considered since not all firms in the sample are publicly listed.

As shown in Table 5.2, the ratio of EBIT to liabilities (a proxy for cash flow available to service debt, tax and equity claims) exhibits a significant decline over the three years prior to distress, which is particularly marked in the year of distress. This reflects deterioration in firms' financial performance (likely to be driven by a decline in business performance) leading to reduced cash generation.

Table 5.3 Evolution of capital structure prior to distress

		N	T - 3	T - 2	T - 1	T 0
Gearing						
Debt to equity (at book values)	Mean	1,370	74%	75%	77%	92%
	Median	1,370	77%	77%	80%	93%

Source: Oxera analysis, based on Bureau Van Dijk data.

The ratio of debt obligations to total assets (gearing) is generally high for companies that subsequently experience financial difficulties (on a book-value basis). It rises significantly in the year of distress, having remained broadly constant in the earlier years. This might be due to increased draw-downs on existing facilities, or the opening of new lines of credit in response to immediate cash shortfalls. It could also represent an increase in trade liabilities as companies seek credit from suppliers, or, to the extent the firm is already realising losses, the impact of the latter on retained earnings. For example, in the case of ASP Realisations (discussed in section 5.9), total liabilities increased markedly relative to total assets due to increases in trade liabilities, mainly in respect of hotel costs and holidays already booked.

5.2.3 Trends by sector

The marked deterioration in financial performance prior to distress is consistent across sectors, with the manufacturing sector as well as the public, education and defence sectors exhibiting the strongest deterioration in performance. This is consistent with the results of the statistical analysis reported in sections 5.7 and 5.8.

Profitability metrics

Across all sectors, firms' ability to generate earnings to cover financial obligations deteriorates substantially over the period leading up to the onset of financial distress, with the most significant declines occurring in the manufacturing industry and public, education and defence sectors.

Table 5.4 Financial performance prior to distress by sector: profitability

Indicator	Sector	N	T-3	T-2	T-1	T0
Net income to assets						
Net income/book value of assets	Manufacturing	612	0.01	-0.01	-0.04	-0.19
	Construction	61	0.02	0.03	0.00	-0.14
	Wholesale, retail, trade and transport	404	0.02	0.01	-0.01	-0.14
	Financial services and real estate	206	0.02	0.01	-0.02	-0.17
	Public sector, education and defence	87	-0.02	-0.02	-0.04	-0.20
EBIT to assets						
EBIT/book value of assets	Manufacturing	612	0.03	0.02	-0.02	-0.11
	Construction	61	0.04	0.05	0.02	-0.10
	Wholesale, retail, trade and transport	404	0.04	0.03	0.00	-0.10
	Financial services and real estate	206	0.05	0.03	0.01	-0.09
	Public sector, education and defence	87	0.00	-0.01	-0.03	-0.15
Return on sales						
EBIT/revenue	Manufacturing	612	0.00	-0.02	-0.05	-0.11
	Construction	61	0.03	0.03	0.02	-0.07
	Wholesale, retail, trade and transport	404	0.02	0.01	-0.01	-0.05
	Financial services and real estate	206	0.04	0.03	-0.03	-0.11
	Public sector, education and defence	87	-0.04	-0.07	-0.10	-0.19

Note: The mean absolute level of the ratio is reported.
Source: Oxera analysis, based on Bureau Van Dijk data.

Ability to service debt obligations

The observed deterioration in debt service metrics is also consistent across sectors, with a substantial decline in the year of distress, particularly for manufacturing firms and the public, education and defence sectors.

Table 5.5 Debt service ratios prior to financial distress

Financial ratio	Sector	N	T-3	T-2	T-1	T0
Cash flow to debt						
EBIT/(book value of liabilities excluding shareholders' capital)	Manufacturing	612	0.04	0.02	-0.04	-0.13
	Construction	61	0.05	0.06	0.02	-0.11
	Wholesale, retail, trade and transport	404	0.07	0.04	0.00	-0.12
	Financial services and real estate	206	0.08	0.05	0.01	-0.10
	Public sector, education and defence	87	0.01	0.00	-0.05	-0.17

Note: The mean absolute level of the ratio is reported.
Source: Oxera analysis, based on Bureau Van Dijk data.

Capital structure metrics

For the average firm in distress, gearing increases by around 15% over the three years prior to distress, and exceeds 90% in the year of distress. Firms in the manufacturing sector and the public, education and defence sector gear up the most over this period.

Table 5.6 Capital structure prior to financial distress

Financial ratio	Sector	N	T - 3	T - 2	T - 1	T 0
Gearing						
Debt to assets (at book values)	Manufacturing	612	69%	70%	72%	90%
	Construction	61	81%	81%	83%	96%
	Wholesale, retail, trade and transport	404	77%	73%	80%	93%
	Financial services and real estate	206	81%	81%	81%	96%
	Public sector, education and defence	87	76%	79%	82%	98%

Note: The mean absolute level of the ratio is reported.
Source: Oxera analysis, based on Bureau Van Dijk data.

5.3 Situation at the point of distress

Box 5.2 Key observations from the empirical analysis

- Firms' financial health deteriorates considerably as they enter into distress, suggesting that declining financial performance constitutes a leading indicator of distress.
- The marked deterioration in firms' financial performance is consistent across all sectors.

Firms' performance deteriorates significantly in the year of distress according to a number of metrics. Table 5.7 illustrates that, in the year of distress, net income becomes negative, implying that total revenues are not sufficient to cover costs.

Table 5.7 Comparison of financial metrics at and before distress

	T - 3	T = 0	Change
Profitability			
Net income to assets			
Mean	0.01	-0.17	-0.18
Median	0.01	-0.11	-0.12
EBIT to assets			
Mean	0.04	-0.11	-0.15
Median	0.03	-0.07	-0.10
Return on sales			
Mean	0.01	-0.10	-0.11
Median	0.02	-0.04	-0.06
Debt service			
EBIT to liabilities			
Mean	0.05	-0.12	-0.17
Median	0.05	-0.07	-0.12
Gearing (debt to assets)			
Mean	74%	92%	+18%
Median	77%	93%	+16%

Source: Oxera analysis.

5.3.1 Trends by sector

The deterioration in firms' financial performance at the onset of distress is also consistent across sectors. As shown in Table 5.8 below, firms across all sectors are less able to generate returns that can be distributed to stakeholders (as represented by the profitability measures). While debt obligations increase for firms across all sectors, the increase is most pronounced in the manufacturing sector and the public, education and defence sectors.

Table 5.8 Financial performance at distress relative to performance prior to distress

	Sector	N	T - 3	T 0	Change
Profitability measures					
Net income to assets	Manufacturing	612	0.01	-0.19	-0.19
	Construction	61	0.02	-0.14	-0.15
	Wholesale, retail, trade and transport	404	0.02	-0.14	-0.16
	Financial services and real estate	206	0.02	-0.17	-0.19
	Public sector, education and defence	87	-0.02	-0.20	-0.18
EBIT to assets	Manufacturing	612	0.03	-0.11	-0.14
	Construction	61	0.04	-0.10	-0.14
	Wholesale, retail, trade and transport	404	0.04	-0.10	-0.14
	Financial services and real estate	206	0.05	-0.10	-0.15
	Public sector, education and defence	87	0.00	-0.15	-0.15
Return on sales	Manufacturing	612	0.00	-0.11	-0.11
	Construction	61	0.03	-0.07	-0.09
	Wholesale, retail, trade and transport	404	0.02	-0.05	-0.07
	Financial services and real estate	206	0.04	-0.11	-0.15
	Public sector, education and defence	87	-0.04	-0.19	-0.15
Debt service					
EBIT to total liabilities	Manufacturing	612	0.04	-0.13	-0.17
	Construction	61	0.05	-0.11	-0.15
	Wholesale, retail, trade and transport	404	0.06	-0.12	-0.18
	Financial services and real estate	206	0.08	-0.10	-0.19
	Public sector, education and defence	87	0.01	-0.17	-0.17
Debt to assets	Manufacturing	612	69%	90%	+21%
	Construction	61	81%	96%	+15%
	Wholesale, retail, trade and transport	404	77%	93%	+16%
	Financial services and real estate	206	81%	96%	+15%
	Public sector, education and defence	87	76%	98%	+23%

Note: The mean absolute level of the ratio is reported.
Source: Oxera analysis, based on Bureau Van Dijk data.

These results illustrate the scale of deterioration over the years before the onset of distress. This deterioration is evident across all sectors on all metrics considered. At the point of distress, firms are typically significantly more indebted than under normal operating conditions, and their financial performance has already declined considerably.

The implication of these findings is that the criteria employed to select the distressed sample captures firms that have already experienced substantial declines in financial performance.

5.4 Firm performance following distress

Box 5.3 Key observations from the empirical analysis

- The average survival rate of firms three years after the onset of distress is around 77%.
- There is significant variation in survival rates across Member States and sectors, with manufacturing firms being substantially less likely to survive.
- Surviving firms tend to reduce employment following the onset of distress, while revenues tend to recover more quickly after the first year of distress. This suggests that, in response to financial difficulties, firms undertake a series of restructuring initiatives aimed at increasing productivity and efficiency.
- Despite the recovery in revenues, the financial health of distressed companies remains poor, and does not recover even five years after the onset of distress.

The development of firms after the onset of distress has been examined to understand the consequences of distress for revenues and employment, and for the business and financial situation of the firm following the onset of distress more generally. This analysis is complicated by the fact that a proportion of firms cease to exist as an independent legal entity because they have either been liquidated or acquired by other firms. Such firms were defined in section 4 as ‘non-surviving’.

Based on the assumption that the revenue and employment of non-surviving firms fall to zero, the following ex post developments of revenues and employment are illustrated across all firms (surviving and non-surviving):

- the proportion of firms that continue business activities (survivability);
- the evolution of financial performance ex post for the ‘surviving’ firms;
- average developments across all firms (surviving and non-surviving).

5.4.1 Survival rates following distress

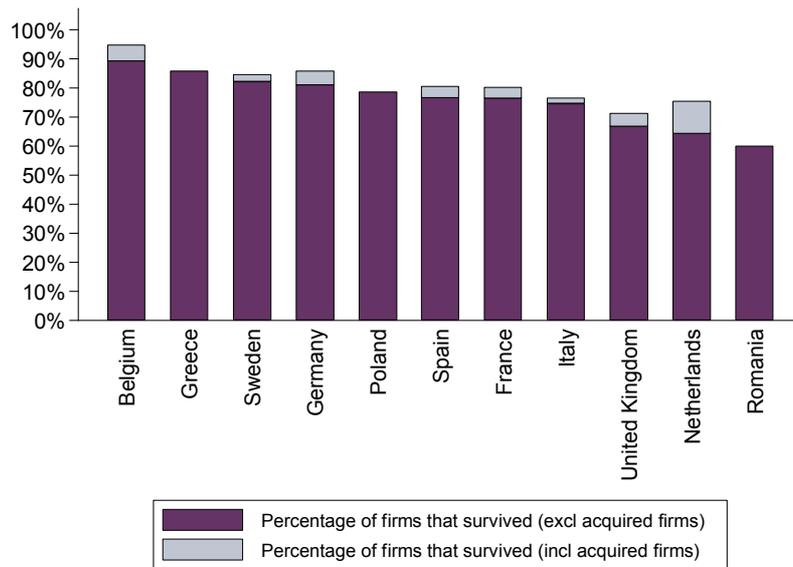
The average survival rate of firms three years after the onset of distress across all Member States based on the sample used for this analysis is 77%. This represents firms that either continued reporting for all three years or were acquired.

The failure rate for firms in the sample going into distress in year 2005 is higher than for other years due to data limitations (ie, due to different reporting dates data is not available for all firms experiencing financial distress in 2005 for all three years afterwards, including 2008). This means that the true survival rate for firms in the sample is likely to be higher (approximately 84%—the average survival rate for firms going into distress in years unaffected by data issues—although this cannot be estimated precisely).⁶⁹

There is some variation across Member States, however, with survival rates ranging from around 90% in Belgium to around 60% in Romania (see Figure 5.2). These results might be affected by differences in the number of firms for which data is available for different countries.

⁶⁹ This is estimated as the average survival rate across all years, excluding those firms that went into distress in 2005.

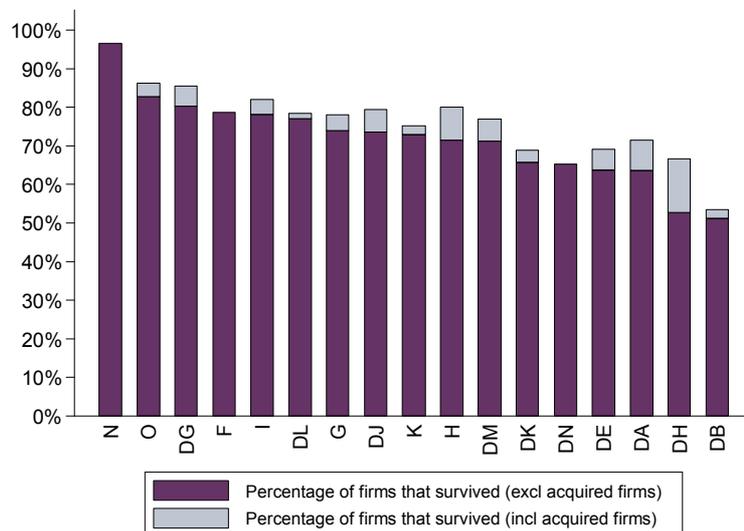
Figure 5.2 Survival rate of firms in difficulty (three years post-distress), by jurisdiction



Note: Jurisdictions with fewer than 20 firms in the sample have been excluded.
Source: Bureau Van Dijk data and Oxera analysis.

There is also variation across sectors, with survival rates for the health sector exceeding 90%, while comparable rates for manufacturing firms are substantially lower (see Figure 5.3). This is consistent with findings that the deterioration in profitability and the ability to service liabilities at the onset of distress, as well as the increase in gearing, are more pronounced for firms in the manufacturing sector.

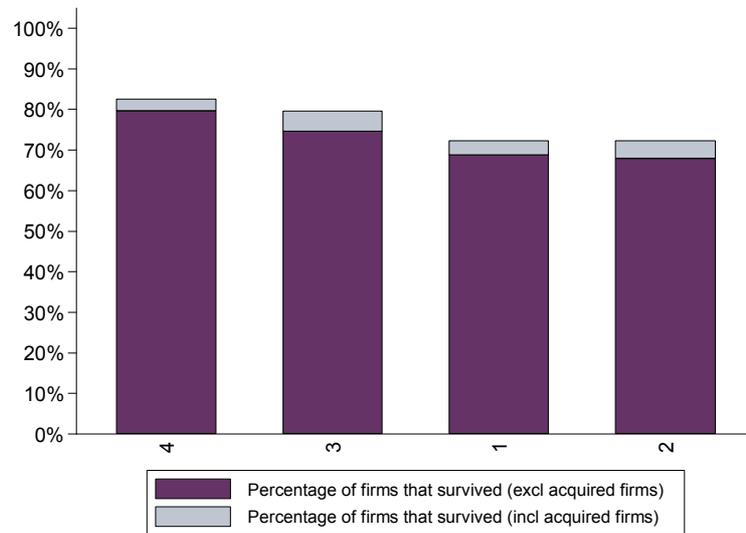
Figure 5.3 Survival rate of firms in difficulty (three years post-distress), by sector



Note: Sectors with fewer than 20 firms have been excluded. N: health and social work; O: other community, social and personal service activities; DG: manufacture of chemicals, chemical products and man-made fibres; F: construction; I: transport, storage and communication; DL: manufacture of electrical and optical equipment; G: wholesale and retail trade; DJ: manufacture of basic metals and fabricated metal products; K: real estate, renting and business activities; H: hotels and restaurants; DM: manufacture of transport equipment; DK: manufacture of machinery and equipment; DN: other manufacturing; DE: manufacture of pulp, paper and paper products; DA: manufacture of food products, beverages and tobacco; DH: manufacture of rubber and plastic products; DB: manufacture of textiles and textile products.
Source: Bureau Van Dijk data and Oxera analysis.

Survival rates three years after the onset of distress also vary according to the size of the firm. Figure 5.4 shows that larger firms are more likely to survive three years after the onset of distress, implying that they are also more able to absorb adverse shocks.

Figure 5.4 Average survival rates for firms in financial difficulty post-distress, by size (4 represents the largest firms and 1 the smallest firms)

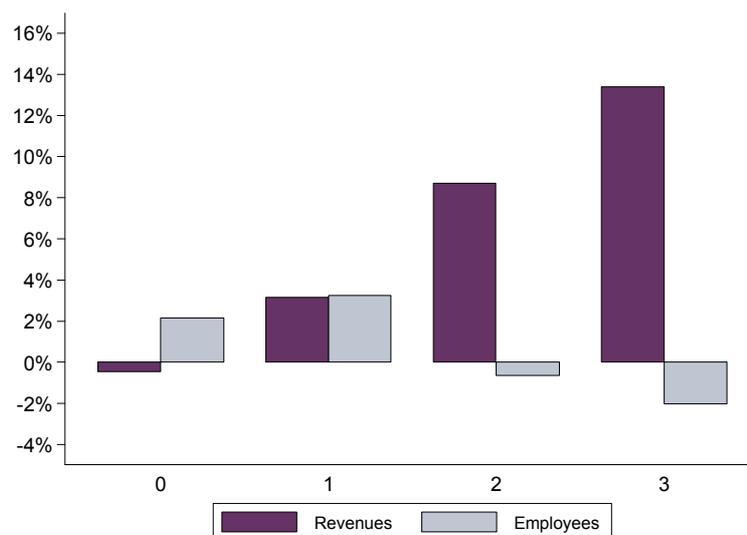


Note: The size categories represent quartiles within the final sample. In this case, size has been defined according to the book value of assets as at $t - 3$. This is intended to capture the pre-distress value of the firms. Category 1 represents the smallest quartile, while category 4 represents the largest quartile. Source: Bureau Van Dijk data and Oxera analysis.

5.4.2 Firm performance post-distress for 'surviving' firms

The post-distress evolution of revenues and employment as well as firms' financial performance has been examined for firms that survive three and five years after the onset of distress. Such firms typically reduce their workforce following the onset of distress, while revenues tend to recover slightly after the first year of distress (see Figure 5.5). The recovery in revenues continues over subsequent years into the fourth and fifth year after the onset of distress (see Appendix A3), while employment continues to fall over the same period.

Figure 5.5 Development of revenues and employment post-distress for surviving firms (% change relative to one year prior to distress)



Note: Average revenues and employment have been calculated with reference to the mean. Source: Oxera analysis based on Bureau Van Dijk data.

The recovery of revenues suggests that, in response to financial difficulties, firms in distress undertake a series of restructuring initiatives aimed at increasing productivity and efficiency. In this respect, the onset of distress acts as a catalyst for business restructuring.

Despite the recovery in revenues, the financial health of distressed companies remains poor in the three years following distress, and, on average, does not fully recover even five years after the onset of distress. As shown in Table 5.9, all the profitability measures remain negative or only marginally above zero in the years following distress, at levels substantially below their pre-distress levels.

Table 5.9 Financial metrics following financial distress (surviving firms)

	N	T 0	T+1	T+2	T+3
Profitability measures					
Net income to assets	996	-0.15	-0.06	-0.02	-0.02
EBIT to assets	996	-0.09	-0.03	0.00	0.00
Return on sales	996	-0.08	-0.07	-0.03	-0.03
Debt service					
EBIT to liabilities	996	-0.10	-0.03	0.01	0.03
Debt to assets	996	91%	91%	90%	89%

Note: Averages have been calculated with reference to the mean.

Source: Bureau Van Dijk and Oxera analysis.

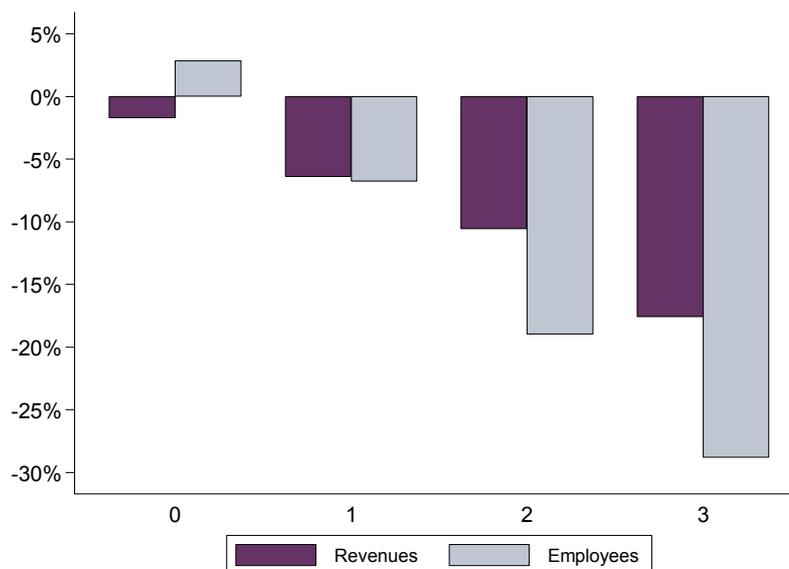
This suggests that restructuring initiatives are not immediately successful in returning firms to profitability; a corollary might be that firms take a number of years to recover financially from distress. This is consistent with findings from existing empirical studies (see section 6.3), which highlight that following an initial shock and associated loss of sales, customers only gradually resume purchasing from the company. This would be expected to manifest itself in a slow recovery in business performance.

5.4.3 Overall development of output and employment for all firms

Figure 5.6 illustrates business performance (revenues and employment) across all firms in the sample.⁷⁰

⁷⁰ Firms that did not survive (including those that may have been acquired or sold in part) are assumed to have zero revenues and employment after the cessation of activities as a going concern.

Figure 5.6 Evolution of revenues and employment following distress (% change relative to the year prior to distress)



Note: Average revenues and employment have been calculated with reference to the mean.
Source: Oxera analysis based on Bureau Van Dijk data.

Across all surviving and non-surviving firms, employment and revenues decline over the three years following the onset of distress, with the same pattern continuing over the fourth and fifth years after the onset of distress. On average, over three years after the onset of distress, employment falls by approximately 30% and revenues by almost 20% relative to their pre-distress levels. For the firms for which data is available in subsequent years, employment and revenues continue to fall over the fourth and fifth years following the onset of distress (see Appendix A3 for further discussion).

5.5 Impact of distress on output and employment—model specifications

This section considers the hypotheses that examine the impact of distress on post-distress outcomes in terms of revenue and employment.

5.5.1 Overall approach to testing

Approximately 28% of all firms exit the sample within three years of the onset of distress (ie, do not survive). To the extent that they (or parts thereof) continue operations in some form post-distress (eg, as parts of different entities), this is not reflected in the tests described below, given the lack of data.

If statistical tests were carried out based only on the ‘surviving’ firms, the results could be subject to a form of selection bias since surviving firms are likely to exhibit different characteristics than non-surviving ones. There are two alternative approaches to undertaking statistical tests directly on the set of surviving firms:

- make an assumption about the level of output and employment for firms that exit the sample. For example, it might be assumed that these firms have shut down their operations and ceased to exist as a legal entity (or that their operations continue to the extent that recovery rates are greater than zero). Under this assumption, it would be appropriate to consider firms to have no employees and revenue after the year of exit from the sample (or a fixed proportion of revenues and employment pre-distress). It would then be possible to estimate key statistical relationships on the basis of the entire

sample (including firms that exit the sample). This approach has been used as a cross-check on the results from the second approach (outlined below);

- control for the systematic differences between surviving and non-surviving firms when estimating statistical relationships on the sample of surviving firms. This second approach requires more complex statistical analysis than the first approach.

To control for the systematic differences between surviving and non-surviving firms, the Heckman selection model has been estimated. This involves two stages.

- First, a model is estimated over the whole sample (including both surviving and non-surviving firms) to examine the factors that influence whether a firm survives over either one or three years following the onset of distress.
- Second, a model is estimated on the sample of surviving firms to examine the relationship between factors that can be observed prior to the onset of distress and the impact on revenue and employment post-distress, controlling for the systematic differences between the characteristics of surviving and non-surviving firms.

Given that at least some of the determinants of survival would be expected to explain the evolution of output and employment post-distress, the same explanatory factors are included in the second stage.

The adopted variables measure both immediate and longer-term outcomes of distress (ie, outcomes measured over one year and three years following distress), and thus avoid placing too much weight on year-specific effects.

Table 5.10 Specification of measures of revenue and employment outcomes

Dependent variable(s)	Interpretation
Change in revenue/employment over the three-year period prior to distress relative to the three-year period post-distress	This measure of distress outcomes compares longer-term average changes in revenues/employment before and after distress
Change in revenue/employment from the year prior to distress to the year immediately following distress	This measure of distress outcomes compares short-term average changes in revenues/employment before and after distress

Source: Oxera.

The results from the second stage are discussed in sections 5.7 and 5.8.

5.5.2 What can explain firm performance post-distress?

The analysis examines the impact of a number of explanatory factors on outcomes post-distress in line with the hypotheses outlined in section 2.3.

- **Firm characteristics**—attributes, such type of business (sector) or size, might be important determinants of firm-level outcomes (see section 6.2.1 for further details).
- **Financial structure**—the way in which a firm finances its activities might affect its ability to survive distress and its financial performance post-distress.
- **Firm performance prior to distress**—this is likely to be indicative of business characteristics as well as the nature of the problems causing financial difficulty that are likely to affect outcomes post-distress.

- **Firm performance at distress**—the severity of any distress is likely to affect how quickly or easily a given firm can restructure and recover post-distress.
- **Market conditions**—developments in the wider economic environment (eg, at the sector or country level) post-distress are likely to affect a firm’s performance post-distress, to the extent that they reflect the market conditions under which the firm operates post-distress.

Specific explanatory factors under each of these categories are examined below.

Firm characteristics

Outcomes of distress are likely to depend in part on characteristics of firms that do not vary significantly over time. Therefore, dummy variables are included in the analysis to control for the influence of the following fixed characteristics.

- **Size**—the impact of distress on survival, revenue and employment might be expected to be different for larger firms than for smaller ones. Evidence from empirical studies shows that the outcomes of distress depend on the size of the firm (see section 6.2.1 for further details). Therefore, size dummies have been introduced into the analysis according to the size of the firm’s assets three years prior to distress.
- **Sector of operations**—variation in survival rates and changes in output and employment across different sectors were highlighted in sections 5.1–5.4. In particular, it was observed that manufacturing firms experience poorer outcomes after distress relative to firms in other sectors. To test this observation, a set of dummies has therefore been included for firms in the manufacturing sector.
- **Country of domicile**—sections 5.1–5.4 also highlighted cross-country differences in firm-level outcomes of distress. As a cross-check, a dummy has been included to capture systematic differences between the 15 Member States that joined the EU before 2004 and the 12 new Member States. This binary dummy variable is set to be equal to one, if the country is from one of the 12 new Member States, and zero otherwise. This variable controls for potential systematic differences in survival rates and output and employment outcomes across the New Member States compared with the existing Member States.

Financial structure

Measures of financial structure examine firms’ solvency and overall degree of financial risk to assess their ability to withstand ‘normal’ business shocks.

Table 5.11 Indicators of financial structure

Independent variable	Interpretation
Gearing (liabilities to total assets in the year of distress)	Captures the aggressiveness of the financial structure in the year of distress.

Source: Oxera.

Firm performance prior to distress

Alternative measures of profitability prior to distress have been assessed to examine whether firm performance prior to distress has any influence on outcomes post-distress.

Table 5.12 Indicators of firm performance prior to distress

Independent variable(s)	Interpretation
Gross return on assets (EBIT prior to distress/assets prior to distress)	Measures the extent to which the underlying profitability prior to distress can provide a cushion against a shock
Gross return to debt holders (EBIT prior to distress/liabilities prior to distress)	Measures the firm's ability to service debt out of operating profits prior to distress
Net return to shareholders (net income prior to distress/shareholders' funds prior to distress)	Measures the firm's net returns to shareholders prior to distress
Change in output (change in revenue prior to distress compared with the year of distress)	Measure of the change in firms' business performance over the period leading up to the onset of distress
Change in performance (change in EBIT/assets prior to distress compared with the year of distress)	Measure of the change in the firms' underlying profitability over the period leading up to the onset of distress

Note: 'Prior to distress' is defined as the year prior to distress when the short-term specification of the dependent variable is used and three years prior to distress when the longer-term specification is used.
Source: Oxera.

Firm performance at distress

Firm performance at distress (severity of distress) has been proxied using performance metrics defined at the point of distress (see Table 5.13).

Table 5.13 Indicators of firm performance at distress

Independent variable(s)	Interpretation
Gross return to debt holders (EBIT in the year of distress/total liabilities in the year of distress)	Captures the firm's ability to service its liabilities at the point of distress
Net return to shareholders (net income in the year of distress/total shareholders' funds in the year of distress)	Captures net loss at the point of distress
Gross return on assets (EBIT in the year of distress/total assets in the year of distress)	Captures operating loss at the point of distress

Source: Oxera.

Economic and sector performance post-distress

The firm-level outcomes are likely to be driven by macroeconomic and industry conditions at the time when the firm is trying to restructure and emerge from distress. For example, as discussed in section 6.2.2, displaced workers may be less likely to find alternative employment if the local market conditions at the time are poor.

To control for the impact of broader macroeconomic and sector effects on the outcomes of distress, GDP growth and sector GVA growth have been included in the analysis as proxies for market conditions post-distress. Specifically, GDP growth is measured relative to long-term growth trends in each Member State, in order to control for country-specific macroeconomic effects. This is analogous to an 'output gap'.

While information pertaining to the future growth of GDP and sector performance will not be within the Commission's information set at the point of distress, it is reasonable to assume that it will be able to use macroeconomic forecasts to form a judgement about the influence of these factors. Table 5.14 below specifies these factors.

Table 5.14 Indicators of market conditions post-distress

Independent variable(s)	Interpretation
GDP (average difference between GDP growth and trend growth following distress)	Captures the potential impact of business cycles on demand for a firm's products or services, controlling for country-specific growth trends
Sector performance (average year-on-year % change in sector GVA following distress)	Controls for sector-wide supply and demand factors affecting a firm in a given industry

Note: 'Following distress' is defined as the year immediately following distress when the short-term specification of the dependent variable is used and the three-year period following distress when the longer-term specification is used.

Source: Oxera.

5.5.3 Robustness checks

To ensure the comprehensiveness of the results, the statistical analysis has been undertaken based on all Member States. Weighted regressions have been carried out where the weights are based on the GDP of each Member State to ensure that the composition of the sample does not place too much weight on any particular country. This corrects for the sample appearing to over-represent firms that are domiciled in particular Member States (especially the UK).

It was highlighted in section 4 that certain firms in the sample were operating as a going concern in 2007, but had yet to report their 2008 financial results. In particular, it was noted that firms going into distress in 2005 that did not report financial results in 2008 could not be treated as surviving under the adopted definition of survival; moreover, the inclusion of all of these firms in the sample as non-surviving firms would have introduced a bias into the analysis, given that they included firms operating on a going-concern basis. Therefore, in order to retain these firms in the sample (thereby ensuring adequate time-series variation), an assumption was made about the treatment of firms that enter distress in 2005, but do not report financial data in 2008. As outlined in section 4.3.4, a proportion of firms that went into distress in 2005, but did not report financial accounts in 2008, are retained in the sample, while the remainder are excluded. To control for any potential bias in the dataset that may be introduced as a result of this adjustment, a binary dummy variable is included in the analysis for firms that go into distress in 2005.

5.6 What explains a firm's survival following distress?

Box 5.4 Key observations from the empirical analysis

Firm performance

- Firms growing faster prior to distress are more likely to survive financial difficulties.
- A more significant decline in performance prior to distress is associated with lower likelihood of survival post-distress.
- Greater severity of distress is associated with lower probability of survival post-distress.
- For the same level of severity of distress, better financial performance prior to distress is associated with lower probability of survival following distress. That is, better performance pre-distress combined with a significant fall in performance reduces the probability of survival relative to weaker performance pre-distress combined with a smaller fall in performance.
- The relationship between firm performance prior to distress and survival rates is weaker over the longer term. This suggests that longer-term survival depends to a greater extent on factors at the time of the distress, rather than historical performance.

Financial structure

- A more aggressive financial structure at distress (as measured by higher financial leverage) is associated with lower survival rates in the short term.
- The impact of higher financial leverage at distress is a weaker determinant of survival in the longer term.

Firm characteristics

- Larger firms are more likely to survive than smaller ones post-distress.
- Firms operating in the manufacturing sector are less likely to survive.

Market conditions

- Firms in difficulty operating in countries with higher GDP growth have lower survival rates (as indicated by the results from the econometric analysis).
- This result from the econometric analysis may be driven by limited variation in GDP growth over the period examined in this analysis, so the impact of changes in GDP over time cannot be effectively measured on the entire sample.
- For selected jurisdictions with a significant number of observations, there is some evidence to suggest that higher GDP growth typically has a positive impact on survival. This finding is derived from an empirical comparison of the average growth in GDP three years after the onset of distress across surviving and non-surviving firms (as reported in section 5.6.5).

5.6.1 Firm performance

At least four key aspects of firm performance prior to distress appear to influence survival rates.

- Firms that perform poorly in the year of distress tend to have lower survival rates. Table 5.16 illustrates that a reduction in EBIT to total liabilities in the year of distress is associated with a reduced probability of survival.
- Controlling for performance at distress, firms whose performance was stronger prior to distress tend to have lower survival rates. Table 5.16 illustrates that if EBIT to assets is high in the year prior to distress, the probability of survival is reduced. Put differently, firms whose performance deteriorates substantially between the period prior to distress and at the point of distress (ie, firms that experience a significant shock) are more likely to cease operations. This implies that profitable firms that are subject to a major shock prior to distress are less likely to survive than less profitable firms that experience a relatively minor shock.

- Higher revenue growth prior to distress appears to be associated with higher survival rates. This suggests that firms that have been growing faster prior to distress (relative to other companies going into distress) are likely to be able to continue operating following distress. It is important to emphasise that this is relative to other peers in distress; as discussed earlier in this section, firms that find themselves in distress appear to grow quickly (on average) pre-distress.⁷¹
- The impact of firm performance prior to distress on longer-term survival outcomes is weaker. Longer-term survival rates are likely to be more closely linked to factors at the time of the distress (and after distress) than to the firm's historical performance.

5.6.2 Severity of distress

Firms that experience greater severity of distress are more likely to cease operations. This effect is particularly significant in the three years following distress. Table 5.16 indicates that a lower ratio of EBIT to total assets in the year of distress is associated with a reduction in the probability of survival over the three years following distress.

5.6.3 Financial leverage

Firms that have a more aggressive financial structure (eg, they are more highly leveraged) are less likely to survive in the year immediately following distress as well as the three years following the onset of distress. As shown in Table 5.16, the results suggest that, on average across all firms in the sample, an increase in gearing in the year of distress leads to a reduction in the probability of survival over the three years following distress.

Firms that are more highly geared are more likely to default on interest and principal payments on existing debt. Such firms may also be less likely to obtain additional financing to meet operating cash-flow requirements or interest and principal payments on existing debt obligations.

As with firm performance, the impact of leverage on survival rates tends to be weaker in the long run.

5.6.4 Firm characteristics

Firm-specific characteristics have been found to be important determinants of survival rates. For example, the size of the company significantly influences survival rates. Table 5.16 suggests that firms in the largest quartile of the sample are 4.0–4.4% more likely to survive in the year following distress than those in the smallest quartile. This may be due to larger firms having greater ability to withstand external shocks.

The sector of operations is also an important determinant of survival rates. It was observed in sections 5.2–5.4 that manufacturing firms tend to experience greater deterioration in financial health than other sectors following distress. To test this observation, a dummy was included for firms operating in the manufacturing sector. As indicated in Table 5.16, manufacturing firms exhibit lower survival rates than other firms, even controlling for firm performance, leverage and broader regional and industry factors. A manufacturing firm in distress is, on average 7.2–8.7% less likely to survive three years after the onset of distress than firms operating in other sectors.

There is some weaker evidence that firms domiciled in the 12 new Member States are more likely to survive in the longer run.

⁷¹ Under the shorter-term regressions (eg, survival during the first year following distress), the change in revenues over the three-year period prior to distress is used to explain outcomes post-distress. Under the longer-term regressions (eg, survival during the first three years following distress), the change in revenues over the pre-distress period is omitted from the longer-term regressions. This is because revenue outcomes following distress—the variable being tested (ie, the dependent variable)—are measured relative to average pre-distress revenues over the same three-year period. The change in revenues over this period cannot be present as both an explanatory variable and as a component of the outcome variable. Hence, the change in revenues over the three-year period prior to distress has been omitted from the regressions.

5.6.5 Market conditions

Although positive economic growth might be associated with stronger business performance in the short term post-distress, the results shown in Table 5.16 in that respect are not significant. Moreover, these results indicate that stronger economic growth following distress tends to be negatively associated with survival rates in the longer term (ie, over approximately three years post-distress).

The negative relationship between economic growth and survival rates in the medium term might initially appear counterintuitive if it is not appropriately interpreted given the nature of the data. Since annual data is used to calculate GDP growth, there are relatively few observations of GDP growth across time for each individual country.⁷² At the same time, there are a large number of countries in the sample with significantly different GDP growth rates. In other words, the level of variation of GDP within each country is low in comparison to the variation of GDP growth across countries.⁷³ Therefore, this result is at least partly associated with cross-country variation in GDP, rather than with time-series variation in GDP for a given country.

Across countries, firms in countries with higher growth rates tend to exhibit lower survival rates. The average survival rate in slow-growing Member States is over 5% higher than in the fast-growing Member States.

Across time, if selected Member States are considered for which sufficient time-series data is available, there is evidence to suggest that firms are more likely to survive if GDP in the Member State is growing faster in the period after firm's distress. For example, Table 5.15 reports average growth in GDP for three years after the onset of distress across both surviving and non-surviving firms for the four largest Member States in the empirical sample used for the firm-level analysis.⁷⁴ This illustrates that, for a number of Member States for which there is a significant number of observations—eg, France, Italy, Spain, and the UK—post-distress growth in GDP is higher for the surviving firms than the non-surviving firms. This provides some indication that, for these Member States, higher growth in GDP would be associated with higher survival rates.

Table 5.15 Comparison of post-distress growth in GDP across non-surviving and surviving firms of the four largest Member States (% growth in GDP)

Member State	Non-surviving firms	Surviving firms
France	1.90	2.04
Italy	1.14	1.24
Spain	3.24	3.48
United Kingdom	2.28	2.58

Note: Non-surviving firms denote firms that do not survive three years following the onset of distress. Surviving firms denote firms that survive three years following the onset of distress. Post-distress growth in GDP varies within Member States as it is calculated as the average growth in GDP for the three years after distress, and is therefore dependent on the year that firms start to experience distress.

Source: Oxera analysis based on Bureau Van Dijk data.

To examine in further detail the relationship between GDP growth and survival rates, the regression model has been estimated on the basis of selected Member States. The results

⁷² There are a maximum of six observations of GDP growth per country (in the UK and Germany).

⁷³ One measure of variation in GDP growth rates is the coefficient of variation, which compares the standard deviation of growth rates to the mean growth rate. The average coefficient of growth rates within countries is 0.17. The average coefficient of variation across countries is 0.54. This indicates that there is approximately three times the variation of growth rates across countries as there is within countries.

⁷⁴ Post-distress growth in GDP varies within Member States as it is calculated as the average growth in GDP for the three years after distress, and is therefore dependent on the year that firms start to experience distress.

suggest a positive (and significant) relationship between GDP growth and survival post-distress. For example, based on data for the UK, the results indicate that there is a strong positive (and significant) relationship between GDP growth and the likelihood of survival, controlling for the influence of other factors, such as performance prior to and at distress, financial structure at distress and firms' characteristics.

Higher sector performance was found not to be statistically associated with survival rates in either the short or the long run. This may be because this measure primarily captures differences in performance across sectors rather than across time for a given sector.

Table 5.16 What explains a firm's survival post-distress?

Dependent/independent variables		Survival during the first year following distress				Survival during the first three years following distress			
Performance prior to distress									
Change in output (change in revenue)		0.035**	0.037**	0.034**	0.033**				
Change in performance (change in EBIT/assets)		0.038				0.115			
Gross return on assets (EBIT/assets)		-0.125**			0.121				
Gross return to debt holders (EBIT/liabilities)		-0.069*			0.082				
Net return to shareholders (net income/capital)		-0.007			0.003				
Performance at distress (severity)									
Gross return on assets (EBIT/assets)		0.032			0.190				
Gross return to debt holders (EBIT/liabilities)		0.025			0.176**				
Net return to shareholders (net income/capital)		0.000			0.001**				
Financial structure at distress									
Gearing (debt/assets)		-0.043***	-0.042***	-0.044***	-0.040***	-0.110*	-0.115*	-0.131**	-0.117*
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.011	-0.013	-0.012	-0.010	-0.016	-0.027	-0.025	-0.020
	3rd quartile	0.016	0.016	0.015	0.017	0.093*	0.095*	0.097*	0.098*
	4th (largest) quartile	0.043***	0.041***	0.042***	0.044***	0.092*	0.092*	0.090*	0.096*
Sector	Manufacturing	-0.022	-0.023	-0.023	-0.021	-0.088*	-0.092*	-0.093**	-0.090*
Domicile	New Member State	-0.022	-0.028	-0.026	-0.029	0.117	0.116	0.130*	0.102
Market conditions									
Economic performance (GDP)		1.111	1.101	1.113	1.066	-12.641***	-13.214***	-12.747***	-12.787***
Sector performance (GVA)		-0.083	-0.080	-0.087	-0.072	0.084	0.138	0.139	0.033
Number of firms		1,327	1,325	1,324	1,328	1,330	1,324	1,330	1,321
Log pseudo likelihood		-249.7	-247.1	-248.9	-249.0	-547.4	-542.4	-544.1	-544.1

Note: The data is weighted, using each Member State's GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. The first stage of the Heckman model is a probit regression of survival rates on the explanatory factors, which is estimated through maximum likelihood. Due to the non-linear nature of the probit function, the relationship between the explanatory factors and firm survival rates is also non-linear, implying that the marginal impact of a small change in an explanatory factor on the probability of survival will vary across firms. For example, the marginal impact of a change in gearing on the probability of survival will be different for a firm with 30% gearing than for one with 80% gearing. The estimates presented here represent the average value of the marginal impacts of each explanatory factor across all firms in the sample. A positive value implies that, across all firms, a marginal increase in the explanatory factor will, on average, tend to increase the probability of survival. *** Significant at the 1% level; ** 5% level; * 10% level. Empty cells indicate that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

5.7 What explains changes in employment post-distress?

Box 5.5 Key observations from the empirical analysis

Firm performance

- Severity of distress has a significant impact on reductions in employment in the year following distress, which may suggest that more severe distress necessitates deeper restructuring of employment.
- This relationship is weaker over the longer term. At the same time, there is some evidence that firm performance prior to distress is a significant determinant of employment outcomes following distress.

Financial structure

- Higher leverage prior to distress is not significantly associated with employment outcomes following distress.

Firms' characteristics

- Larger firms tend to exhibit deeper cuts and slower recovery in employment post-distress than smaller firms. This might be due to greater inefficiencies as well as the need for deeper restructuring. Moreover, restructuring larger firms is likely to be more lengthy and complex, resulting in falling employment over a longer period of time.
- Manufacturing firms appear to experience poorer employment outcomes relative to firms operating in other sectors.
- Outcomes are more negative for those firms domiciled in the 12 new Member States.

Market conditions

- Economic and sector performance is not significantly associated with employment outcomes following distress.

5.7.1 Firm performance

There is some evidence that poorer firm performance in the year of distress (severity of distress) is associated with greater reductions in firm-level employment post-distress. Table 5.17 shows that two of the three measures of severity of distress (defined as at distress) illustrate that there is a positive relationship between the severity of distress and the reduction in employment in the first year following the onset of distress.⁷⁵

The results reported in Table 5.17 imply that a reduction in the ratio of EBIT to total liabilities of 10% in the year of distress leads to a 1.6% reduction in employment in the first year after distress.

This relationship between the severity of distress and employment in the short term suggests that more severe distress necessitates immediate action by management and deeper restructuring. The relationship between the severity of distress and firm-level employment is weaker over the three years following distress than in the year immediately following distress. In particular, subsequent job losses are likely to be more closely related to events that take place after the onset of distress, and might depend to a lesser extent on the severity of the initial period of distress.

⁷⁵ Tables 5.16 and 5.17 indicate that there is a positive relationship between two measures of severity of distress—gross return on assets (EBIT/assets) as at distress and gross return to debt holders (EBIT/liabilities) as at distress—and the percentage change in employment one year following the onset of distress. The magnitude of the relationship between the other measure of the severity of distress—net return to shareholders (net income/capital)—and the change in employment one year post-distress is very small in absolute terms and therefore has not been considered.

There is some evidence that performance prior to distress is significantly linked to employment outcomes.⁷⁶ This indicates that poorer performance prior to distress leads to a greater reduction in employment in the first year and third year after the onset of distress.

5.7.2 Financial structure

There does not appear to be a significant link between financial structure and employment outcomes following distress. This contrasts with the findings from the analysis of survival rates, which indicated that higher gearing is associated with lower survival rates. This might be expected since higher leverage is likely to increase a firm's financial risk (since it increases the likelihood that the firm will not be able to meet its interest and principal repayment obligations), but might have less of an impact on the firm's business risk and operational characteristics. As a consequence, while higher gearing increases the likelihood of bankruptcy and exit from the sample, it does not affect the outcomes for firms that survive and avoid bankruptcy.

5.7.3 Firm characteristics

The size of a firm and its sector of operations are significantly associated with employment outcomes following distress.

Large firms exhibit deeper cuts in employment and slower subsequent recovery in the size of the workforce relative to small firms. Specifically, the growth of employment for the firms in the largest sample quartile is 17–20% lower than those in the smallest sample quartile in the year following distress, and approximately 36% lower in the three years following distress. This is consistent with the interpretation that surviving smaller firms are easier to restructure following distress and might require less restructuring than larger firms, which may require more complicated and lengthy recovery programmes. Moreover, since large firms are more likely to survive than small firms, many of these firms are likely to be in need of deeper restructuring. In contrast, small firms in such a position might simply not survive.

Firms operating in the manufacturing sector experience greater reductions in employment relative to firms operating in other sectors. Table 5.17 indicates that revenue growth is 5–7% lower for manufacturing firms relative to firms operating in other sectors in the year immediately following distress, and 9–10% lower over the three years following distress.

Outcomes are also less positive for firms domiciled in the 12 new Member States.

5.7.4 Market conditions

There does not appear to be a significant relationship between GDP growth and employment outcomes following distress (the relationship is positive but not statistically significant). This may be a result of relatively few observations of GDP growth for individual countries.⁷⁷ It could be also due to the level of variation of GDP across time for each country being low compared with the variation of GDP growth across countries.⁷⁸

Sector performance also does not appear to be significantly associated with employment outcomes following distress.

⁷⁶ This is based on evidence from the one-stage regressions reported in Table 5.17.

⁷⁷ There are a maximum of six observations of GDP growth per country (in the UK and Germany).

⁷⁸ One measure of variation in GDP growth rates is the coefficient of variation, which compares the standard deviation of growth rates to the mean growth rate. The average coefficient of growth rates within countries is 0.17. The average coefficient of variation across countries is 0.54. This indicates that there is approximately three times the variation of growth rates across countries as there is within countries.

Table 5.17 What explains changes in employment post-distress? (Two-stage regressions)

Dependent/independent variables		% change in employment: one year prior to distress to one year post-distress				% change in employment: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Change in output (change in revenue)		0.043	0.039	0.060	0.042				
Change in performance (change in EBIT/assets)		0.112				0.041			
Gross return on assets (EBIT/assets)			0.151				0.185		
Gross return to debt holders (EBIT/liabilities)				-0.023				0.107	
Net return to shareholders (net income/capital)					0.008				0.008
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.154				0.101		
Gross return to debt holders (EBIT/liabilities)				0.163**				0.097	
Net return to shareholders (net income/capital)					-0.001*				-0.002*
Financial structure at distress									
Gearing (debt/assets)		0.136*	0.120	0.053	0.109	0.056	0.078	0.053	0.053
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.042	-0.041	-0.057	-0.043	-0.159**	-0.162***	-0.167***	-0.165***
	3rd quartile	-0.139***	-0.134***	-0.121***	-0.146***	-0.297***	-0.291***	-0.293***	-0.303***
	4th (largest) quartile	-0.194***	-0.196***	-0.170***	-0.203***	-0.361***	-0.362***	-0.365***	-0.359***
Sector	Manufacturing	-0.048	-0.048	-0.065*	-0.041	-0.089*	-0.091*	-0.095**	-0.087*
Domicile	New Member State	-0.135***	-0.127***	-0.131***	-0.142***	-0.260***	-0.236***	0.241***	-0.260***
Market conditions									
Economic performance (GDP)		0.851	0.891	1.742	0.825	2.582	3.446	3.079	2.662
Sector performance (GVA)		-0.493	-0.478	-0.547	-0.573	0.011	-0.022	-0.023	-0.100
Number of firms		1,357	1,356	1,358	1,355	1,362	1,361	1,356	1,356
Log pseudo likelihood		-783.4	-778.4	-774.0	-778.1	-1,148.4	-1,143.2	-1,141.6	-1,139.3

Note: The data is weighted, using each Member State's GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. These results correspond to the second-stage estimates of the Heckman selection model, which is estimated through maximum likelihood. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

Table 5.18 What explains changes in employment post-distress? (One-stage regressions)

Dependent/independent variables		% change in employment: one year prior to distress to one year post-distress				% change in employment: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Change in output (change in revenue)		0.068*	0.065	0.067	0.065*				
Change in performance (change in EBIT/assets)		0.173*				0.085			
Gross return on assets (EBIT/assets)			-0.011				0.220***		
Gross return to debt holders (EBIT/liabilities)				0.007				0.189***	
Net return to shareholders (net income/capital)					0.000				0.008
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.194				0.146*		
Gross return to debt holders (EBIT/liabilities)				0.155**				0.089	
Net return to shareholders (net income/capital)					-0.001***				0.000
Financial structure at distress									
Gearing (debt/assets)		-0.017	-0.022	-0.044	-0.030	-0.063	-0.059	-0.067	-0.070
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.072	-0.071	-0.072	-0.072	-0.112**	-0.115**	-0.123**	-0.124**
	3rd quartile	-0.112**	-0.108**	-0.108**	-0.119**	0.193***	-0.189***	-0.193***	-0.200***
	4th (largest) quartile	-0.146***	-0.147***	-0.148***	-0.151***	-0.214***	-0.213***	-0.215***	-0.220***
Sector	Manufacturing	-0.081**	-0.081**	-0.083**	-0.073*	-0.127***	-0.128***	-0.127***	-0.123***
Domicile	New Member State	-0.167***	-0.163***	-0.157***	-0.175***	-0.200***	-0.189***	-0.175**	-0.212***
Market conditions									
Economic performance (GDP)		2.083	2.107	1.904	2.083	-2.776	-2.916	-2.878	-2.605
Sector performance (GVA)		-0.572	-0.569	-0.566	-0.641	-0.138	-0.074	-0.053	-0.134
Number of firms		1,358	1,358	1,357	1,357	1,356	1,356	1,356	1,351
R-squared		0.094	0.096	0.096	0.093	0.188	0.200	0.197	0.184

Note: One-stage (ordinary least square) regressions are performed on the entire sample. The regressions are weighted using each Member State's GDP to ensure that the composition of the sample does not place too much weight on a particular Member State. Non-surviving firms are assumed to have zero revenues and employment after having exited the sample. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data

5.8 What explains changes in output post-distress?

Box 5.6 Key observations from the empirical analysis

Firm performance

- Firm performance pre-distress is a significant determinant of the changes in output following distress.
- Firms whose revenues have been growing faster prior to distress appear to experience a greater reduction in revenues following the onset of distress.
- Greater severity of distress and higher firm performance prior to distress seem to be associated with poorer revenue outcomes. This is consistent with the findings on survival rates and employment.

Financial structure

- Higher financial leverage (higher proportion of debt in capital structure) prior to distress is significantly associated with longer-term revenue outcomes following distress.

Firm characteristics

- Larger firms' revenues tend to grow more slowly following the onset of distress. This might be due to greater difficulties restructuring larger firms, which might be more complex and take longer.
- Manufacturing firms tend to experience poorer revenue outcomes relative to firms operating in other sectors.

Market conditions

- Although the relationship appears positive, economic and sector performance are not significantly associated with revenue outcomes following distress.

5.8.1 Firm performance

At least four key aspects of firm performance prior to distress seem to influence the change in output post-distress.

- Higher growth in firm revenues prior to distress is negatively associated with revenue outcomes following distress. For example, Table 5.19 below shows that a 10% increase in revenues prior to distress is associated with a 10–14% contraction in revenues in the year following distress. This implies that, while higher growth pre-distress might allow a firm to survive a shock, it is also associated with slower recovery.
- Greater severity of distress is typically associated with lower revenues post-distress, as in the case of employment.
- Firms' absolute and relative financial performance prior to distress has significant implications for output post-distress. The results appear to be consistent with the findings on survival rates: firms that experience a significant shock at distress are likely to experience poorer revenue outcomes. Controlling for firm performance at distress, better financial performance prior to distress is associated with poorer revenue outcomes. Table 5.19 indicates that a 10% reduction in EBIT to assets between the year prior to distress and the year of distress is associated with a 4.3% reduction in revenues. Put differently, for the same level of severity of distress, better financial performance prior to distress is associated with lower revenues following distress. That is, better performance pre-distress combined with a significant fall results in lower output post-distress relative to weaker performance pre-distress combined with a smaller fall in performance.
- The impact of firm performance prior to and at distress on changes in output in the longer term is only slightly weaker than in the short term.

5.8.2 **Financial structure**

There is some evidence that financial structure does appear to be significantly linked to longer-term output post-distress; although, there is only very limited evidence to suggest that there is a relationship in the short-term.

5.8.3 **Firm characteristics**

The size of a firm and the sector in which it operates are important determinants of outcomes post-distress.

Larger firms exhibit significantly slower growth in revenue following distress relative to those in the smallest sample quartile. Specifically, the growth of revenues for the firms in the largest quartile is lower by approximately 14–15% in the short term and 24–25% in the long term than for the smallest firms in the sample.

It was posited previously that the lower employment growth of large firms following distress could be a result of more lengthy and complex restructuring processes for larger firms. By contrast, smaller firms are easier to restructure, and recover more quickly following distress (if they survive). This is also reflected in the observed revenue growth post-distress.

Moreover, larger firms tend to operate at a more mature stage of the product or industry life cycle. This stage is characterised by stable but slowly growing or stagnant revenues. By contrast, smaller firms are likely to be operating at an earlier stage of the product cycle, which is typically characterised by higher growth but greater volatility. This is consistent with the findings from the analysis of survival rates, which suggest that larger firms are more likely than smaller firms to survive following distress. These findings are likely to reflect the greater stability of larger firms.

Firms operating in the manufacturing sector experience greater reductions in revenue than those operating in other sectors. Table 5.19 below indicates that revenue growth is approximately 5% lower for manufacturing firms than for those operating in other sectors in the year immediately following distress, and approximately 5–6% lower in the three years following distress.

5.8.4 **Market conditions**

There does not appear to be a significant relationship between economic and sector performance and the evolution of revenues following distress. However, the observed coefficients are positive; this is intuitive since better economy- or sector-wide economic conditions post-distress would be expected to contribute positively to firm's performance post-distress.

The fact that these results are not significant is likely to be a result of relatively few observations of GDP growth for individual countries. It could be also due to the level of variation of GDP across time for each country being low compared with the variation of GDP growth across countries

Table 5.19 What explains changes in output (revenue) post-distress? (Two-stage regressions)

Dependent/independent variables		% change in revenue: one year prior to distress to one year post-distress				% change in revenue: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Change in output (change in revenue)		-0.130***	-0.128***	-0.099***	-0.135***				
Change in performance (change in EBIT/assets)		0.432***				0.285***			
Gross return on assets (EBIT/assets)			-0.378***				-0.088		
Gross return to debt holders (EBIT/liabilities)				-0.279***				-0.091	
Net return to shareholders (net income/capital)					-0.015				-0.001
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.458***				0.380***		
Gross return to debt holders (EBIT/liabilities)				0.361***				0.304***	
Net return to shareholders (net income/capital)					-0.001***				-0.003**
Financial structure at distress									
Gearing (debt/assets)		0.148*	0.145*	0.109	0.124	0.238**	0.261**	0.138	0.270**
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.065**	-0.066**	-0.065**	-0.076**	-0.120***	-0.115***	-0.119***	-0.121***
	3rd quartile	-0.141***	-0.140***	-0.139***	-0.158***	-0.198***	-0.191***	-0.200***	-0.218***
	4th (largest) quartile	-0.149***	-0.152***	-0.142***	-0.146***	-0.241***	-0.245***	-0.254***	-0.243***
Sector	Manufacturing	-0.053	-0.049	-0.048	-0.050	-0.056	-0.050	-0.052	-0.051
Domicile	New Member State	-0.020	-0.017	-0.010	-0.037	-0.046	-0.028	-0.050	-0.054
Market conditions									
Economic performance (GDP)		1.253	1.297	1.536	1.962	2.834	4.013	3.666	3.005
Sector performance (GVA)		0.283	0.343	0.278	0.061	0.497	0.655	0.510	0.315
Number of firms		1,327	1,325	1,324	1,328	1,330	1,324	1,330	1,321
Log pseudo likelihood		-447.1	-448.5	-460.3	-491.8	-800.5	-786.5	-793.2	-803.4

Note: The data is weighted, using each Member State's GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. These results correspond to the second-stage estimates of the Heckman selection model, which is estimated through maximum likelihood. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

Table 5.20 What explains changes in output (revenue) post-distress? (One-stage regressions)

Dependent/independent variables		% change in revenues: one year prior to distress to one year post-distress				% change in revenues: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Growth of the firm (revenue)		-0.066**	-0.069**	-0.070**	-0.076**				
Change in gross return on assets (EBIT/assets)		0.436***				0.235***			
Gross return on assets (EBIT/assets)			-0.485***				-0.082		
Gross return to debt holders (EBIT/liabilities)				-0.304***				-0.053	
Net return to shareholders (net income/capital)					-0.007***				-0.002
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.436***				0.293***		
Gross return to debt holders (EBIT/liabilities)				0.366***				0.196**	
Net return to shareholders (net income/capital)					0.000				-0.001
Financial structure									
Gearing (debt/assets)		-0.020	-0.017	-0.072	-0.047	-0.017	-0.012	-0.051	-0.017
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.097***	-0.097***	-0.099***	-0.098***	-0.157***	-0.160***	-0.157***	-0.158***
	3rd quartile	-0.117***	-0.114***	-0.117**	-0.133***	-0.179***	-0.174***	-0.176***	-0.185***
	4th (largest) quartile	-0.093**	-0.088**	-0.095**	-0.086**	-0.199***	-0.195***	-0.203***	-0.195***
Sector	Manufacturing	-0.088**	-0.088**	-0.089**	-0.079**	-0.082**	-0.085**	-0.084**	-0.077*
Domicile	New Member State	-0.058	-0.057	-0.063	-0.083*	-0.088	-0.079	-0.087	-0.110*
Market conditions									
Economic performance (GDP)		2.828	2.857	2.813	3.192	-3.161	-3.269	-3.429	-3.203
Sector performance (GVA)		0.139	0.144	0.117	-0.051	0.161	0.216	0.137	0.028
Number of firms		1,337	1,334	1,333	1,337	1,340	1,340	1,345	1,337
R squared		0.1521	0.1571	0.1580	0.1239	0.1839	0.1849	0.1819	0.1743

Note: One-stage (ordinary least square) regressions are performed on the entire sample. The regressions are weighted using each Member State's GDP to ensure that the composition of the sample does not place too much weight on a particular Member State. Non-surviving firms are assumed to have zero revenues and employment after having exited the sample. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data

5.9 Observations from selected case studies

Box 5.7 Key findings from case studies

Causes of financial distress

- In most cases reviewed, operating losses seem to originate from market developments. While some factors, such as stock market crashes or sector-specific shocks, might have been beyond management control, the review of case studies indicated that the response of management may either mitigate or intensify the negative external effects of these factors for a company.
- In some cases, the difficulties appear to have been largely driven by sector-level effects.
- Firms with aggressive financial structures (eg, with a high level of debt) prior to the onset of distress may be less able to respond to changes in market conditions.
- Firms are better able to respond to the onset of distress through restructuring if the firm's assets can be retained with a stand-alone business.

Process of distress

- An efficient insolvency process with effective administration might help to ensure more positive outcomes of distress.

Outcomes of distress

- Some but not all cases suggest that more severe financial distress, higher gearing and more complex corporate structures lead to poorer outcomes following distress.

5.9.1 Approach to case studies

A number of case studies have been undertaken in the course of this project. These more in-depth studies of selected cases provide insights into the reasons for financial difficulty, the restructuring process, and the factors affecting outcomes post-distress.

The aim of the analysis of the case studies is to understand the nature of relationships between the causes and outcomes of distress on specific examples, rather than to test the general hypotheses in a statistically significant manner. The case studies also provide useful evidence to test the relevance of the selected hypotheses in actual examples of distress.

By studying in more depth selected firms experiencing difficulties, it is possible to gain a better understanding of the longer-term consequences of insolvency scenarios through information that is not necessarily available for large samples of cases used in statistical analysis.

The remainder of this section presents the results from the case study analysis. This analysis is based on an assessment of the drivers of financial distress, the characteristics of firms in distress, the restructuring process, and outcomes. The overall approach is similar to that used in clinical studies in corporate finance, where in-depth analysis of small samples allows for delineation of key links, better understanding of the detail of each case, and identification of key factors that might be relevant in larger samples.

In this context, clinical studies have previously been used to study the effects and sources of financial distress in highly leveraged transactions, with the course of each transaction traced

from the period prior to the leveraging transaction up to the resolution of financial distress. For instance, Andrade and Kaplan (1998) study 31 highly leveraged transactions (HLTs) from the 1980s that subsequently became financially distressed, to show that HLTs succeeded in creating value. These authors estimate the costs of financial distress at 10–20% of firm value.

5.9.2 Case studies summary

The analysis undertaken in this section draws insights from a selected number of case studies (see Table 5.21).

Table 5.21 Summary of the selected case studies

Company	Country	Industry	Insights regarding the primary causes of distress	Indication of key milestones	Indication of outcomes
ASP Realisations	UK	Manufacture of electrical equipment	International competition, cash acquisition of a competitor	1930: established. 2000: develops activities in China and Tunisia. 2002: acquires Otehall. 2003: bankruptcy and sale	Otehall sold to Saia Burgess (no workers displaced); ASP Realisations sold to Elektron (104 of 329 workers displaced)
Danish Steel Works	Denmark	Steel production	Overcapacity in the steel production sector, and increasing costs	1940: founded. 1999–2001: large operating losses. 2002: suspension of payments followed by bankruptcy	The company's main plant was bought by an investment fund, and its name changed to Dansteel. By 2006 total employment in the three main plants (owned by different investors) was 35% lower than before the bankruptcy
Finelist	UK	Manufacture and trading of car components	Strategy of external growth through acquisition, and highly geared balance sheet	1994: first listed on the London Stock Exchange. 1994–99: series of 60 acquisitions. 2000: acquisition by EADL and administrative receivers appointed	First restructuring by the administrative receivers: 838 redundancies and 88 sites closed. Most of the group's businesses sold as going concerns, and remaining assets liquidated. Expectation that 90% of 5,000 jobs (as at appointment of receivers) would be preserved
Golden Sun Holidays	UK	Tour operator	Drop in demand for holidays after terrorist attacks in New York; price reductions; increased liabilities	1995: incorporated. 2001: difficulties in sector following attacks in New York. 2003: licence revoked by the UK Civil Aviation Authority. 2004: enters into receivership	The company stopped trading. 20,000 trips were cancelled. All employees were made redundant and assets liquidated
Gontard & MetallBank	Germany	Bank	Exposure to German Neuer Markt equities: market falls totalling more than 95% by 2002	1999: creation through merger of two banks. 2001: higher than expected loss. 2002: regulator orders cessation of dealing with clients; insolvency proceedings opened	17,000 private clients were protected by the Deposit Protection Fund. No detailed information on the outcomes for 231 employees. Assets liquidated: estimated 50% shortfall
Junckers	Denmark	Manufacture of wooden floors and wood care products	Decrease in demand, failure of new production plant and high gearing	1930: founded. 1996 and 1999: large operating losses. 2003: failure to repay loan, files for suspension of payments and 168 employees are made redundant	Acquired by Axcel in 2004, avoiding bankruptcy. By 2008, employment declined by over 50% compared with before the bankruptcy and sales fell by 8% per year, on average
LEGO	Denmark	Manufacture of toy products	Challenges adapting company strategy to changes in toy market, increasing competition	1932: founded. 1998: company's first loss, 1,000 jobs cut. 2000: restructuring plan emphasising change in company strategy. 2004: operating loss reported	After the failure of its first restructuring efforts in 2000, LEGO cut a further 1,000 jobs in 2004 as a result of losses. A new strategy was implemented. The CEO injected DKK800m into the company as a subordinated loan. Since then LEGO has been profitable, with employment 40% lower than the 1998 level

Company	Country	Industry	Insights regarding the primary causes of distress	Indication of key milestones	Indication of outcomes
Metallgesellschaft	Germany	Industrial conglomerate with activities including chemical engineering and financial services	Rapid growth between 1990 and 1992, driven partly by acquisition. Substantial losses in 1993 due to exposure to the global commodities market—the result of its hedging strategy	1881: established. 1992: firm's subsidiary, MGRM, begins marketing long-term fixed-price guarantees. 1993: MGRM's derivative losses estimated at \$1.2 billion. January 1994: \$1.9 billion bail-out package agreed by banks. 1995: assets of around DM7.5 billion divested (29% of 1992 turnover)	The impact on Metallgesellschaft's workforce was significant: by September 1995, employment had declined to 23,400: a reduction of 60% over employment levels in September 1992. Half of this reduction was achieved through asset sales and the remainder (about 19,500) through restructuring
Métaltemple	France	Casting of steel	Decreasing demand from the automotive industry; increased prices of raw materials (difficult to pass on to clients); increasing international competition	1917: established. 1999: divested by Renault. 2002: taken over by consortium of private equity firms. 2007: placed under court-supervised administration. Parent company sold to Bavariaring 0906 GmbH. 2008 sold for €1 to B4	Workforce decreased by 24% (100 employees) and sales by 35% since first divested by Renault. A further 29 jobs were expected to be lost in the restructuring process
Moulinex	France (activities in 11 countries)	Manufacture of small household appliances	Increased international competition; growth through external acquisitions; highly geared financial structure	1937: established. 1991: acquisition of Krups. 1994: two plants closed down. 1996: change of management. 1998: decreased sales in Russia and stock price decline. 2000: merger with Brandt. 2001: placed under court-supervised administration	Four of the nine plants in France were taken over by Groupe SEB, retaining 1,860 of 4,500 jobs. Other plants (eg, CGME) were acquired by management-backed companies. 3,000 redundancies in France (including sub-contractors): 43% of the workforce found alternative employment by 2004, and 40% were retired or covered by other social measures
Netia	Poland (insolvency also in the Netherlands and the USA)	Fixed-line telecoms operator	Significant difficulties with operating costs exceeding revenue, and high capital expenditure to launch fixed-line services. This need for funds coincided with the bursting of the dotcom bubble, which made it more difficult to raise capital	1999: Polish telecoms market is liberalised in larger cities. 2001: default on interest payment: Netia files for bankruptcy under Polish law. 2002: Sweden's Telia participates in emergency issue: restructuring agreed with most creditors	In 2004, Netia operated 462,000 phone lines (an increase of 20% on 2003). In 2008 this had almost tripled to 1.3m. Netia entered the broadband market, with market share growing from 1.5% in 2004 to 7.2% by 2006
Scotia	UK	Pharma company	Foscan, a drug produced by Scotia, failed to secure regulatory approval. Despite restructuring efforts, the company did not generate sufficient cash flows to meet its debt obligations	1979: established. 1993: Scotia floated. 2000: regulators reject Foscan. 2001: administrators appointed. EU regulator reverses its decision and Foscan is sold to Singapore Technologies	Administrators resubmitted Foscan to the regulators, and the European Medicines Evaluation Agency overturned its previous ruling and licensed the drug. With the approval of Foscan, the administrators were able to sell Foscan and its production facility to Singapore Technologies. Foscan eventually went into commercial production

Company	Country	Industry	Insights regarding the primary causes of distress	Indication of key milestones	Indication of outcomes
Stalexport	Poland	Steel and metal goods distribution	Market factors, including falling prices and increased competition	1963: founded. 1994: listed on Warsaw stock exchange. 1997: wins tender for 30-year motorway concession. 2000–01: large operating losses, filed for arrangement with creditors	In 2002 Stalexport reached an agreement with its creditors, giving them significant ownership in the company. Steel divisions were sold to further reduce debt. In 2007 Stalexport's remaining assets (mainly its motorway concession) were acquired by Edizione Holding and merged with its Atlantia Autostrade group
Telewest	UK	Telecoms operator, with services including cable TV, broadband, landline services, business data solutions, and basic TV channels	Accumulation of substantial debt in construction of network and acquisition of cable companies. Intense competition, resulting in insufficient earnings for the company to meet its interest payments. This need for funds coincided with the bursting of the dotcom bubble, which made it more difficult to raise capital	1984: Croydon cable established. 1992: joint venture company becomes Telewest. 1990s: construction of network and acquisition of other cable companies. 2002: default of Telewest; 2002–04: negotiations with creditors, shareholders and banks	40% of workers were made redundant in the course of the restructuring. After its merger with ntl, Telewest was bought by Virgin Mobile in July 2006. Virgin Media had turnover and employees of £3.6 billion and 17,000 in 2006, compared with an aggregate of £3.8 billion and 20,000 for the predecessor companies
ZPS	Czech Republic	Manufacture of machine tools	Adverse market conditions combined with high gearing resulting from previous acquisitions	1995: acquisition of TOS Celakovice and Kovošvit Sezimovo. 1998: operating losses. 1999: ZPS declared bankrupt and buyers sought for assets	In 2000 the company's main assets were purchased by Tamjac, and other subsidiaries were sold separately in the following months. Workforce reduced by 225 as a result of acquisition, and subsequently by a further 250 employees

Note: The information summarised in the above table is based on publicly available information, in order to provide an indication of the primary causes of distress, key milestones and outcomes.

Source: Oxera, based on publicly available information.

The analysis of the case studies is conducted from the perspective of four areas of interest:

- causes of financial distress that could influence the process and outcomes of distress;
- the process of distress, highlighting developments that influence the implications of distress;
- firm-level outcomes;
- industry- and regional-level outcomes.

5.9.3 Causes of financial distress

As discussed in section 2.2, financial distress can be caused by many factors, such as revenue, cost, cash flow or financial drivers. These can affect a single firm, the industry or the economy as a whole. The cases reviewed in this analysis encompass all of these drivers.

A wide range of business-related factors may cause firms to experience financial difficulties. The factors affecting revenues or costs—or a combination of both—are, in general, associated with large operating losses.

In only one case (pharmaceuticals company, Scotia) did the operating losses appear to have been driven mainly or solely by firm behaviour. The company became insolvent after the market value of its assets declined sharply because Foscan, its key drug, failed to secure regulatory approval, being rejected first by the US Food and Drug Administration in September 2000, and then by the European Medicines Evaluation Agency (EMA) in January 2001.⁷⁹ This contributed towards the firm encountering financial difficulties, followed by bankruptcy and administration.⁸⁰

Market- and sector-specific factors are often causes of distress. For example, the end of the dotcom bubble appeared to affect many firms that relied on access to the market for funding purposes. In three cases reviewed (Métaltemple, Netia and Stalexport), operating losses appear to have been driven largely by sector-level effects.

- Métaltemple, a sub-contractor within the automobile industry, appeared to experience increasing market pressure from a combination of two factors. Prices of raw materials rose and, in common with most other sub-contractors, there is some indication that Métaltemple may have found it difficult to pass on these increased costs to its customers because of its market position (a result of its small size, as well as increasing international competition).⁸¹ In common with other sub-contractors in the industry, the company's volumes decreased when its main clients, car manufacturers, relocated some of their activities abroad. Between 1986 and 2006, the number of employees in this sector fell from 61,931 to 43,753 in France.⁸²
- In April 1999, Netia, a Polish fixed-line telephony operator, was granted a licence for network construction and delivery of phone and Internet access services in Poland. In 1999 and 2000 Netia recorded significant operating losses, which may have been predominantly due to its exposure to exchange rate risk—most of its large investment programme was financed with loans denominated in foreign currencies.⁸³ Liquidity pressures also arose, which may have been a result of the high level of CAPEX required to launch fixed-line services in the Warsaw area.⁸⁴ Netia's need for additional funding also coincided with the end of the dotcom bubble and the associated lack of appetite for exposure to telecoms.⁸⁵

⁷⁹ *The Guardian* (2001), 'Scotia nears bankruptcy after latest setback', January 25th.

⁸⁰ *Financial Times* (2001), 'Administrator examines Scotia's four options', July 8th.

⁸¹ *Les Echos* (2007), 'Un secteur frappé de plein fouet par la mondialisation', August 27th.

⁸² *Les Echos* (2007), 'Un secteur frappé de plein fouet par la mondialisation', August 27th.

⁸³ *Rzeczpospolita*, No. 115, May 19th 1999.

⁸⁴ *Parkiet* (2000), 'Spada EBITDA Netii', November 22nd, p. 3.

⁸⁵ Reuters News (2001), 'Na GPW spadki, Netia blisko historycznego minimum', April 2nd.

- The declining steel market may have been a contributing factor towards Stalexport selling a significant proportion of its steel divisions.⁸⁶ Although publicly available information does not provide an indication about how Stalexport's steel divisions performed, Stalexport faced strong competition from Asian and South American steel companies.⁸⁷ The company responded to difficult market conditions by reducing its exposure to the steel market and focusing on the operation of its motorway assets.

In most of the other cases reviewed, operating losses appear to originate from market developments that may not have been optimally addressed by the firm.

- Gontard & MetallBank's difficulties may have been partly driven by the limited diversification of its customer base.⁸⁸ It specialised in corporate and investment banking services to small and medium-sized businesses, mainly in relation to the Neuer Markt, Germany's stock market for technology shares. Its performance was therefore highly correlated to the performance of the Neuer Markt. The company expanded with the Neuer Markt boom of the 1990s, but following falls in this market the bank filed for insolvency in 2002.⁸⁹ Although the fall in the Neuer Markt is not specific to Gontard & MetallBank, the extent of its exposure to that fall may be partly a result of its non-diversified business model.
- After the September 2001 terrorist attacks in New York, travel agents and tour operators witnessed a significant fall in demand. Golden Sun Holidays' response to these difficulties included reducing prices in an attempt to increase demand in a declining market.⁹⁰ This strategy may have amplified the negative financial consequences of a demand shock, and may have contributed towards the tour operator filing for bankruptcy.⁹¹
- German conglomerate, Metallgesellschaft, suffered substantial losses in 1993 as a result of the exposure of one of its subsidiaries to the global commodities market, the result of its hedging strategy in respect of certain contracts. Declining oil prices, in particular, appeared to affect its subsidiary, MGRM.⁹² Lower oil prices reduced the value of its derivative positions, which in turn led to calls from counterparties for increased margins.
- International competition appeared to be a major cause of distress for both ASP Realisations and Moulinex.⁹³ Both companies were active in sectors where offshore production gained a significant market share, and the competitive positions of both companies may have suffered from attempts to restructure and regain their market positions through acquisitions.⁹⁴
- Difficult conditions in the steel market led to severe losses for Danish Steel Works in 1999.⁹⁵ Despite an increase in steel prices the following year, the company incurred losses, which may have been partly due to the extent of over-capacity in the industry. Together with an increase in costs, this may have worsened the firm's liquidity position

⁸⁶ Puls Biznesu (2001), 'Stalexport Won't Reduce As Much Debt As Hoped', January 9th, and *Gazeta Wyborcza* (2001), 'Light at the End of Tunnel for Stalexport?', June 22nd.

⁸⁷ Institute for Market Economics (2000), 'Polish Steel Industry'.

⁸⁸ Reuters (2001), 'German bank Gontard faces more financial woes', May 7th.

⁸⁹ Reuters (2002), 'German court opens Gontard bank insolvency process', May 17th.

⁹⁰ Travel Weekly (2004), 'Golden Sun to focus on trade', March 15th.

⁹¹ Joint Administrative Receiver's Report, filed at Companies House on December 22nd 2004.

⁹² Mellon and Parsons (1995), p. 118.

⁹³ Arcoelectric Holdings Plc (2001), 'Report and Accounts, 2000'.

⁹⁴ Conseil de la Concurrence (2002), 'Avis n° 02-A-07 du 15 mai 2002 relatif à l'acquisition d'une partie des actifs du groupe Moulinex par le groupe SEB'.

⁹⁵ European Confederation of Iron and Steel Production (1999), 'Annual Report'.

and weakened its ability to respond to further market shocks, which eventually led to its bankruptcy.⁹⁶

- LEGO responded to the changing toy market by diversifying its product offering, but three years later, after further losses, there is some indication that LEGO altered its strategy to refocus on its key products.⁹⁷ This appeared to be associated with another period of difficulties, but LEGO's subsequent alterations to its strategy may have contributed towards a return to a profitable position.⁹⁸

These cases illustrate the importance of sector- and economy-wide conditions in explaining the occurrence of financial distress. While some factors (such as stock market crashes or sector-specific shocks) are uncontrollable, the response of management can either mitigate or intensify the negative external effects of these factors for a firm. A firm's ability to react appropriately to such shocks might be expected to lead to positive outcomes relative to other companies also affected.

Financial distress often appears to be associated with an aggressive financial structure (high level of debt) adopted prior to distress.

In the cases examined, this may be largely because highly geared companies are typically more vulnerable to demand shocks or changes in market structure as a result of national or international competition, or other factors. For example, the highly geared financial structure of ASP Realisations (following the acquisition of Otehall) may have increased the risk of financial distress in the event of an external shock: in this case such an external shock appeared to have originated from a change in the competitive landscape.⁹⁹ An aggressive financial structure also meant that raising funds to develop production capacity abroad was more difficult.

The case of ASP Realisations has certain similarities with the insolvency of Moulinex, whose highly geared financial structure following the acquisition of its German competitor, Krups, may have made Moulinex more vulnerable to challenges from international competition.¹⁰⁰

In the case of Golden Sun Holiday's insolvency, financial difficulties also appear to have been associated with a more aggressive financial structure. Its strategy of reducing prices in response to falling demand after the September 2001 terrorist attacks in New York may have contributed towards a substantial increase in liabilities, mainly in respect of hotel costs and holidays already booked. Its liabilities increased by 230% (up from £5.8m to £19.1m) between 2000 and 2001.¹⁰¹ As a consequence, the company became more highly geared, which may have contributed towards the company being more vulnerable to insolvency.¹⁰²

In another case, S&P's assessment of Telewest's finances in 2001 is an example of financial distress potentially being associated with an aggressive financing structure:¹⁰³

the group's very high leverage results from a significant and expensive consolidation phase during the late 1990s and from an underestimation of capital expenditures.

In the late 1990s and early 2000s, Telewest bought smaller cable competitors in order to achieve sufficient scale. In subsequent years, it experienced financial problems, which may have been partly the result of the level of debt incurred in constructing its cable network and its acquisition of other cable companies and assets.¹⁰⁴ The company's aggressive capital

⁹⁶ Danish Steel Works (1999–2001), 'Annual Reports'.

⁹⁷ Lauwert (2008).

⁹⁸ LEGO (2003), 'Annual Report'.

⁹⁹ Dealogic.

¹⁰⁰ *Financial Times* (1992), 'Krupps purchase puts Moulinex in the red', October 16th.

¹⁰¹ ORBIS and company accounts, as filed at Companies House.

¹⁰² ORBIS and company accounts, as filed at Companies House.

¹⁰³ S&P (2002), 'Telewest Communications', Ratings Direct, June 12th.

¹⁰⁴ ORBIS and Telewest (2004), 'Annual Report'.

structure may have exacerbated the effects of it not being able to raise funds on the capital markets, and in November 2002 it defaulted.¹⁰⁵

These cases also suggest that outcomes, in terms of employment and output, are better for firms that have been acquired but not fully integrated. These firms, in cases of financial difficulty, can be more easily sold as a going concern.

Stand-alone parts of a larger business might be easier to sell or restructure and therefore preserve output and employment for at least some parts of the business.

For instance, the administrative receivers appointed to repay the creditors of ASP Realisations were able to divest the recently acquired Otehall without redundancies.¹⁰⁶

Furthermore, a few months after failing to find buyers for the whole of Danish Steel Works, the main plant was sold and reopened, while two secondary plants were sold to different buyers almost two years later.¹⁰⁷ This suggests that the flexibility to be able to separate the assets of Danish Steel Works on a stand-alone basis had beneficial effects for employment and output at the reopened plant.

5.9.4 The process of distress

In the case of Scotia, the administrators appeared to play a key role in preserving the value of its assets. Half of the workforce was retained by the administrators, and Foscan (its most important drug) was resubmitted to the regulators. The EMEA overturned its previous ruling and licensed the drug.¹⁰⁸ With this approval, the administrators were able to sell Foscan and its production facility to Singapore Technologies.¹⁰⁹ Foscan eventually went into commercial production, and was able to generate profits for its current owner, Biolitec.¹¹⁰

The administrative receivers also proceeded very quickly in the case of ASP Realisations. The administrators were appointed in November 2003, and ASP Realisations and Otehall were sold in December 2003.¹¹¹ The relatively positive outcome in terms of employment (with 225 of 329 jobs at ASP Realisations retained, and all jobs preserved at Otehall) suggests that swift restructuring may have helped to preserve employment and output.¹¹²

In the case of the insolvency of Finelist, the majority of its divisions were sold in less than five months.¹¹³ It is likely that this short time span allowed for a greater recovery value and less disruption of output than might have been the case under a less efficient regime.

The cases reviewed suggest that an efficient insolvency process with effective administration might significantly help to ensure more positive outcomes of distress.

The case of Metallgesellschaft presents a different picture of the insolvency process, and suggests that the characteristics of the German bankruptcy regime may have been crucial in preventing the company from entering into formal bankruptcy procedures. The regime requires that in the event that assets are sold, all associated employees must be retained and their benefits secured. This creates a substantial incentive not to liquidate the company.

The major creditors, who were also major shareholders of the company, established a rescue operation equivalent to \$1.9 billion (involving some 120 German and international banks) to prevent Metallgesellschaft from going into formal insolvency.¹¹⁴ This may have

¹⁰⁵ S&P (2002), 'Research Update: Telewest Communications plc', *Ratings Direct*, October 3rd.

¹⁰⁶ Administrative Receiver's Report, as filed at Companies House on March 12th 2004.

¹⁰⁷ Company annual accounts and EMCC Case Studies (2006), 'Managing Large-scale Restructuring: Danish Steel Works'.

¹⁰⁸ *Financial Times* (2001), 'Scotia in talk with rival on Foscan sale', June 29th.

¹⁰⁹ Regulatory News Service (2001), 'Scotia Holdings Plc Disposal', August 15th.

¹¹⁰ Biolitec (2007/08), 'Annual Report'.

¹¹¹ Dow Jones International News (2003), 'Elektron Buys Arcoelectric Assets', December 24th.

¹¹² Administrative Receiver's report, as filed at Companies House on March 12th 2004.

¹¹³ Administrative Receiver's Report, published by Companies House on February 17th 2001, Dealogic, various press articles.

¹¹⁴ Jayaraman and Shrikhande (2007).

been more costly for the creditors. It is not clear whether a formal insolvency procedure would have led to a different impact on the company's workforce.

Similarly, in the case of Stalexport, 67% of its 309 creditors voted in favour of the proposed creditors' agreement through which they would receive ownership in the company's equity in exchange for a reduction in their claims.¹¹⁵

5.9.5 Firm-level outcomes

A number of cases suggest that greater financial distress may lead to worse firm-level outcomes following the onset of distress.

For instance, the poor outcome of the insolvency proceedings of Golden Sun Holidays—the assets of which were sold piecemeal and whose employees were all made redundant—may be thought to derive, in part, from the severity of its financial distress.¹¹⁶

Similarly, Scotia was generating heavy losses, and the market value of its assets fell to low levels relative to its debt when its core product, Foscan, was rejected by the authorities. Scotia's activity ceased completely after it filed for bankruptcy, and certain assets were divested with the remaining jobs preserved.¹¹⁷

On the other hand, with regard to Finelist, there appear to have been limited signs of difficulty prior to the firm entering into bankruptcy. The due-diligence process administered by EADL prior to its purchase of the group did not reveal material signs of difficulty, and the new owners did not restructure the business in the course of the six months before it was declared insolvent by the creditor-appointed administrative receivers.¹¹⁸ In comparison with other cases reviewed, the outcomes were not particularly severe, with employment preserved for more than 85% of the group's 5,800 employees, and most divisions sold as going concerns.¹¹⁹

Companies that are highly geared prior to distress may tend to experience more severe outcomes after the onset of distress.

For instance, the poor outcome of the insolvency proceedings of Golden Sun Holidays may have derived in part from its financial structure.¹²⁰

Similar outcomes in the insolvency of Gontard & MetallBank may also suggest that firms with highly geared financial structures are likely to experience a greater reduction in firm-level output and employment following the onset of distress.¹²¹

The corporate structure of a company plays an important role in determining the impact of distress on output and employment.

This is illustrated by the financial distress and rescue of Metallgesellschaft. In this case, major creditors were also major shareholders in the company. Jayaraman and Shrikhande (2007) indicate that this feature of Metallgesellschaft's corporate structure was instrumental in the establishment of a rescue operation equivalent to \$1.9 billion by approximately 120 German and international banks to prevent it from going into formal insolvency.¹²²

However, this is not to say that complex corporate structures cannot be overcome or that simple ones cannot pose problems to restructuring efforts. Examples of the former are Netia

¹¹⁵ Prawo i Gospodarka (2002), 'Stalexport's Debt Reduced', May 29th.

¹¹⁶ Joint Administrative Receiver's Report, filed at Companies House on December 22nd 2004.

¹¹⁷ Ernst & Young (2001), April 18th, para 7.12.

¹¹⁸ Dealogic.

¹¹⁹ *Coventry Evening Telegraph* (2001), 'Jobs safeguarded in Finelist sell-off', May 18th.

¹²⁰ According to ORBIS and company accounts as filed at Companies House, the company's level of gearing increased from 70% in 1998 to over 90% in 2002.

¹²¹ ORBIS and company accounts as filed at Companies House.

¹²² Jayaraman and Shrikhande (2007).

and Stalexport, which successfully restructured their liabilities after obtaining the approval of their numerous creditors.¹²³ The latter is best illustrated by Junckers, which failed to agree with its main single creditor after failing to repay its loan. The firm was saved from bankruptcy a few months later when it was acquired by a private equity fund, after which creditors agreed to restructure the company's liabilities.¹²⁴

¹²³ Netia (2002), 'Annual Report' and Stalexport (2007), 'Annual Report'.

¹²⁴ Boersen (2003), 'Haarde Odds for Junckers', November 18th.

6 Review of empirical evidence on the implications of financial distress for output and employment at the firm, regional and industry levels

6.1 Overview

The impact of financial distress on output and employment at the firm level depends on several factors, including financial, operational and market conditions. This section reviews findings from existing empirical studies on those factors that affect the likelihood of whether firms survive after the onset of financial distress, as well as the impact on employment and output at the firm, regional and industry level. This review provides additional insights into the relationships between the drivers of difficulty, the restructuring process and the outcomes.

The section starts by considering results from existing studies that have examined the impact of financial distress on employment at the firm level, before assessing the impact at the regional and industry level. The objective is to understand under what conditions job losses, as a result of financial distress, turn into long-term unemployment problems. The subsequent section considers the impact of financial distress on firm-level output to ascertain whether certain firm- and sector-specific characteristics are associated with more negative outcomes. Subsequently, the impact of distress on output at the regional and industry level is examined.

Existing empirical studies that have examined the impact of financial distress on employment and output are considered in sections 6.2 and 6.3 respectively. Each section begins by considering the impact of financial distress on outcomes at the level of the firm before looking at the impact on regional- and industry-level outcomes.

6.2 Review of existing research on employment

The onset of financial distress leads firms to reduce their staffing levels over the short and medium term as a result of financial constraints. Some displaced workers may find employment with competitors, especially if competitors' activities expand following the demise of a rival firm. However, this may only partly compensate for the loss of jobs at the firm that experiences difficulties in the first place.

Empirical research has examined whether financial distress leads to a permanent decrease in employment rates in that sector, or whether displaced workers are successful in finding alternative employment elsewhere, potentially in different sectors. This research has been reviewed for the purposes of this study to understand in what markets, cases and circumstances employment effects are likely to persist—ie, the conditions under which distress-related job losses turn into long-term unemployment or non-participation in the workforce. This review of existing studies also provides useful insights into long-run employment effects and the factors that explain the impact of distress on employment rates.

It emerges from the research that the ability of displaced workers to find alternative employment depends primarily on the characteristics of the employees and features of the regional labour market, rather than firm- or sector-specific characteristics. This suggests that in order to identify cases where distress has a long-run impact on employment, some knowledge of the characteristics of employees at the distressed firm, and of local labour market conditions, is required.

6.2.1 Impact on employment at the firm level

The main factors from existing empirical studies that can explain the evolution of the workforce at the firm level following the onset of distress are summarised below, according to each of the hypotheses set out in section 2.3.

Box 6.1 Key observations

Firm and sector characteristics

- Distressed firms with a greater proportion of specific assets that cannot be readily transferred to alternative uses are more likely to reduce employment following the onset of financial difficulties. This may be due to such firms being less able to dispose of poorly performing business divisions, which restricts any attempts at restructuring.
- The reduction in employment, following the onset of distress, will be greater for smaller firms as well as those firms operating in the manufacturing sector.

Firm performance

- Distressed firms initially reduce their reliance on temporary workers before considering changes to employment policies for full-time workers, through reductions in the working hours of permanent staff or in the overall staffing level.

Financial structure

- Highly geared firms that experience financial distress will reduce staffing levels to a greater extent following the onset of financial distress. This may be a result of highly geared firms having less headroom to respond to any adverse shocks.
- The reduction in employment at the firm level following the onset of distress will be greater for distressed firms that are not able to access external capital markets.

Workforce and labour market characteristics

- The extent to which distressed firms are able to reduce their staffing levels in response to the onset of difficulties depends on the flexibility of labour market legislation.

Hypothesis: within a given sector and jurisdiction, more severe financial distress leads to greater reduction in firm-level employment following the onset of distress

A number of empirical studies have examined the response of corporate behaviour to financial pressures. In response to the onset of distress, firms typically reduce their staffing levels, initially decreasing their use of temporary workers before considering changes to their permanent staffing levels. The extent to which firms are able to alter their staffing levels in response to the onset of financial distress depends on the characteristics of labour legislation across Member States.

The reduction in firm-level employment, in response to the onset of distress, will be greater for firms with any of the following characteristics.

- **Restricted access to external capital markets.** Firms that are not able to access alternative sources of finance are likely to reduce their workforce by a greater extent in response to the onset of financial difficulties.
- **Operating in the manufacturing sector.** Manufacturing firms that experience financial distress are less likely to survive, which may be a result of inherent structural problems in the manufacturing sector across Europe.
- **Smaller firms.** In response to the onset of difficulties, smaller firms are more likely to reduce their staffing levels than larger firms, which may be because the latter having greater buffers to absorb any adverse shocks.

Table 6.1 Examples of findings on the impact of severity of distress

Jurisdiction	Findings
France	<p>Employment grows faster at firms that are able to access external sources of finance than at comparable firms with access to internal sources of funds only.</p> <p>Firms that face difficulties and are not able to raise external sources of finance may have higher productivity levels in the short run because they need to reduce costs in order to generate capital that cannot be raised through financial markets.</p>
Germany	<p>Financing constraints lead to a reduction in employment and increased likelihood of changes in staffing levels because firms that experience distress are more likely to focus on short-run liquidity requirements than long-term investment plans.</p> <p>Since firms that experience financing constraints may abandon their investment plans, this may have a knock-on effect on employment through the impact on their contractors and suppliers.</p>
Italy	<p>Financially constrained firms reduce their reliance on temporary, rather than permanent, workers in response to the onset of financial difficulties. As a consequence of the reduction in temporary staff, fixed-term workers may be required to work additional hours.</p>
Spain	<p>After a certain threshold is reached, growth in employment and investment at those firms with a weaker financial position declines significantly. The employment policies of such firms will be more responsive to any changes in financial conditions.</p> <p>After the onset of difficulties, firms typically reduce their reliance on temporary workers first before considering other changes to their employment policy. As such, demand for flexible labour displays greater sensitivity to financial factors.</p>
International	<p>In response to financial distress, firms retrench their workforce quickly. An empirical study has found evidence of a rapid and significant reduction of around 5% of the labour force in the year following the onset of distress.</p>

Source: Musso and Schiavo (2008), Smolny and Winker (1999), Benito and Hernando (2002), Benito and Hernando (2007), Benito and Hernando (2008), Hernando and Martínez-Carrasca (2008), Benito, Delgado and Martínez-Pagés (2004), Caggese and Cuñat (2006).

Hypothesis: controlling for the severity of distress, more highly geared financial structures will lead to a greater reduction in firm-level employment following the onset of distress

Several studies investigate the impact of financial structure on employment at the firm level. Broadly, findings from existing empirical studies confirm that distressed firms that are more highly geared are more likely to reduce staffing levels following the onset of financial distress. This may be due to difficulties accessing additional credit to finance new investment projects, leading to increased exposure to any adverse shocks.

Table 6.2 Examples of findings on the impact of financial structure

Jurisdiction	Findings
Germany	Employment declines as distressed firms increase their proportion of debt relative to their asset base.
Spain	Firms with high debt relative to their capacity to generate funds from operations experience lower growth in investment and employment, particularly during recessions.
United Kingdom	Employment grows more slowly at firms that are more highly geared. A recent study has confirmed this finding in the manufacturing sector. Firms with high levels of debt experience greater volatility in their employment over the business cycle as a result of their greater exposure to any adverse shocks.
International	Although not restricted to firms that experience financial distress, an empirical study finds that employment declines as firms' ratio of debt to total assets increases. This is attributed to high levels of outstanding debt relative to total assets leading to a higher cost of borrowing. Managers may also have more incentive to reduce employment when the ratio of debt to assets is high since adjustments to employment levels may be a less costly way of obtaining the necessary funds to meet obligations to the firms' debt holders. The impact of high gearing levels on employment differs between manufacturing and non-manufacturing firms. For manufacturing firms, a higher ratio of debt to assets increases the speed with which employment adjusts towards the equilibrium level. In contrast, for non-manufacturing firms, a higher ratio of debt to assets has a negative impact on employment.

Sources: Nickell and Nicolitsas (1999), Funke et al. (1999), Ogawa (2003), Hernando and Martínez-Carrasca (2008), Nickell and Wadhvani (1991), Mizen and Yalcin (2006), Spaliara (2006).

Hypothesis: greater asset substitutability (whether the firm's assets can be bought by another company) will lead to smaller reductions in firm-level employment following the onset of distress

Empirical studies have typically examined the impact of asset substitutability on intermediate outcomes, such as recovery rates, rather than employment outcomes. Recovery rates have been found to be lower when assets are not substitutable and cannot readily be transferred to other uses.¹²⁵ Distressed firms that have a greater proportion of non-specific assets are more likely to be restructured than acquired or liquidated.

This suggests that the reduction in employment following the onset of distress is likely to be smaller at firms with a greater proportion of assets that can be transferred to alternative uses following the onset of financial distress. This may be due to such firms being more able to dispose of poorly performing business divisions, which aids any attempts at restructuring.

6.2.2 Impact on employment at the regional and industry level

A significant body of research has examined the characteristics of workers who are more likely to be made redundant after firms experience difficulties, and their prospects for re-employment. Prospects for re-employment following displacement, caused by financial distress, depend on workers' characteristics and local labour market conditions.

Some studies show that, all else equal, displacement leads workers to suffer a loss in earnings, not only during the transitory period of adjustment but also in the longer run.¹²⁶ As a consequence, job displacement appears to have permanent, or at least long-lasting, effects: even several years after displacement, displaced workers have lower annual earnings and lower prospects for being employed.

Findings from existing empirical studies about the prospects for workers' re-employment have been examined to identify which cases of distress are more likely to result in long-run costs to the employees of the distressed firm, as well as to shed light on the wider ramifications for the regional economy.

¹²⁵ Acharya, Bharath and Srinivasan (2004).

¹²⁶ European Restructuring Monitor (2006).

Box 6.2 Key observations

Firm and sector characteristics

- The likelihood of displacement is higher in the construction and manufacturing industries than in other sectors, possibly due to structural weaknesses of the manufacturing industry.

Workforce and labour market characteristics

- Displaced workers are more likely to be young, less educated and male.
- A significant proportion of displaced workers (around 10–20%) are still unemployed three years after losing their jobs.
- The likelihood of re-employment following displacement depends on workers' characteristics as well as local labour market conditions, with displaced workers less likely to find re-employment if the local unemployment rate is also high.
- Labour market regulations affect the ease with which firms can alter their employment policies as well as potential workers' prospects for re-employment.

Characteristics of displaced workers

Displaced workers are more likely to be blue-collar, male, young, less educated, and working in the manufacturing or construction industries.

As shown in Table 6.3, differences in the type of work (for example, manual or skilled) as well as length at the particular establishment affect the likelihood of displacement: displaced workers typically earn, on average, 9% less than those who continue to be employed.

There is some evidence from studies in Belgium, Denmark and the UK that male workers are twice as likely to be displaced as female workers, with those under the age of 25 being more likely to be displaced. There is also some variation in displacement rates across industries, with construction having the highest rate, at 13%, and public services the lowest, at around 1.4%.

Table 6.3 Factors increasing (decreasing) the probability of displacement + (-)

Country	Manual labour	Less educated	Previously unemployed	Construction industry	Services industry	Low tenure	Low wage	Young	Foreign workers	Male
Belgium	+					+	+			+
Denmark	+					+	+			+
Germany						+				
Netherlands						+	+	+		
Portugal			+							
Sweden		+							+	
UK				+	-			+		+
International	+	+			-				+	

Source: Stevens (1997), Farber (1993), Kletzer (1998 and 2004), Kuhn (2002), Lamo et al. (2008), Carneiro and Portugal (2006), Eliason and Storrie (2006), Hijzen et al. (2006).

Factors influencing the probability of re-employment

Displacement may often turn into long-term unemployment, with a significant proportion of displaced workers still being unemployed three years after losing their jobs. Although some are successful in gaining employment, a significant proportion (around 10–20%) remain unemployed in the long term.

The likelihood of re-employment following displacement caused by financial distress depends primarily on workers' characteristics, as well as local labour market conditions. Workers are less likely to find re-employment if there are high levels of unemployment in the local labour market.

Table 6.4 summarises the factors that influence the length of time displaced workers spend unemployed, as well as future earnings if they are successful in obtaining employment.

Empirical studies find that displaced workers who are older, with longer tenure with a particular firm and poorer qualifications are likely to remain unemployed for a longer time. This is because older workers are more likely to have developed skills that are specific to a particular employer, which may not be readily transferable to other roles. If they are successful in obtaining alternative employment, these factors will have a negative impact on the wage that they can command when re-employed.

Displaced workers with poorer qualifications will also be more likely to spend longer in unemployment. Evidence from Estonia and Poland suggests, for example, that each additional year of education increases the probability of becoming re-employed by around 10%, while those who have only vocational degrees are 12–16% (8–14% in Poland) less likely to re-enter employment.¹²⁷

The length of time that displaced workers remain unemployed also varies across Member States, partly due to variations in labour market conditions. As shown in Table 6.2, empirical studies have found that the duration of unemployment is considerably longer in Belgium than in Denmark or the Netherlands.

¹²⁷ Lamo, Messina and Wasmer (2008) found that workers in Germany who are more highly educated are less likely to find re-employment. This may be a result of the greater welfare benefits provided to highly educated workers under the German welfare system.

Table 6.4 Factors increasing (decreasing) the probability of re-employment + (-)

Country	Likelihood of short-term unemployment for displaced workers	Duration of unemployment	Likelihood of long-term unemployment for displaced workers	Education	Age	Tenure	Wage	Male	Effect on earnings for the displaced worker
Belgium	65% experience unemployment within 3 years	15 months	10% remain unemployed after nearly 3 years						4% lower
Denmark	31% experience unemployment within 3 years	5 months	10% remain unemployed after 1.5 years						6% lower
Estonia	14% experience unemployment			+	-	-			
France			20% remain unemployed after five years	+					n/a
Germany				- (higher welfare benefits)					1-2% less (the difference declines with time)
Netherlands	27% experience unemployment	5 months			-		+		No significant effect
Poland			27% remain unemployed after two years	+	-	-	+		
Portugal									Four years after displacement men's wages fall by 12% and women's by 9%
Sweden			3% remain unemployed after 12 years						n/a
UK			50% remain unemployed after one year				+	-	10% less (with older workers 15% less)
International				University degree: +16%					13% lower than wages pre-displacement

Sources: Stevens (1997), Farber (1993 and 1997), Kletzer (1998 and 2004), Kuhn (2002), Lamo et al. (2008), Carneiro and Portugal (2006), Eliason and Storrie (2006), Hijzen, et al. (2006).

6.3 Review of existing research on output

A number of studies have examined the impact of financial distress on output at the firm level, alongside the wider implications for output at the regional and industry level, as set out in the hypotheses developed in section 2.3.

6.3.1 Implications for the firm level

Existing studies have been examined to understand the relationship between the drivers of distress, the restructuring process and the outcomes of distress in terms of the evolution of firm-level output following the onset of distress.

Box 6.3 Key observations

Firm and sector characteristics

- A firm is less likely to survive the onset of distress if it has a greater proportion of specific assets that cannot easily be redeployed to other industries and if it sells highly specialised products.
- Firms with a greater amount of tangible assets are more likely to reduce their capital investment programme in response to the onset of distress.
- The average costs of financial distress are lower under the Nordic legal origin than the German origin, with the UK and French legal origin between these two groups.
- Although French insolvency regimes focus on the preservation of a firm as a going concern, some empirical studies have found that survival rates are higher under the UK and Nordic legal regimes. This may be partly due to UK banks managing distressed firms through centralised ‘business support units’ in order to improve coordination.
- Banks adjust their behaviour in response to the features of the bankruptcy regime. For example, French banks respond to their creditor-unfriendly code by requiring firms to contribute greater collateral.
- In concentrated industries, rivals may take advantage of the onset of distress by adopting predatory strategies.

Firm performance

- Firms typically adjust their planned investment in response to the onset of distress. Furthermore, their sales decline following the onset of financial distress.
- As the severity of distress increases, the reduction in firms’ sales increases.
- Customers only return slowly to those firms that experienced the most severe financial distress.

Financial structure

- Highly geared firms are likely to experience more severe financial distress, leading to a greater reduction in sales and investment than for otherwise comparable firms in the same industry.
- The costs of financial distress are lower for firms with a less complex financial structure.
- The likelihood that distressed firms survive following the onset of financial difficulties is higher for those whose liabilities predominantly comprise bank debt or debt from fewer lenders.
- The ability of distressed firms to access additional bank finance depends on their business and financial characteristics, with larger and less highly geared firms being more likely to obtain additional bank financing.

Each of the above findings is considered below, according to each hypothesis of interest.

Hypothesis: within a given sector and jurisdiction, more severe financial distress leads to a greater reduction in firm-level output following the onset of distress

Existing empirical studies find that distressed firms’ sales and expenditure on capital investment fall following the onset of financial difficulties. As the severity of distress increases, sales at the distressed firm decline further, with customers returning only slowly to firms that have experienced the most severe distress.

Financially distressed firms may not have sufficient funds to undertake their planned level of CAPEX, and may experience difficulties raising the necessary capital from outside investors. This may prevent them from undertaking investment, even though it would have a positive net present value and would therefore enhance the value of the firm. This suggests that, as the severity of distress increases, the opportunity cost of investment forgone as a result of financial distress will be greater. The adverse impact is greater for the largest firms and those with a greater amount of tangible assets.

Table 6.5 Examples of findings on the impact of severity of distress

Country	Findings
UK and Germany	<p>As the expected probability of bankruptcy rises, firms experience reduced sales and earnings, and often reduce employment. Growth in sales of the distressed firm relative to others in the industry will also decline.</p> <p>Insolvent firms have lower sales than other firms in the industry, even if these firms do not subsequently become bankrupt.</p>
International	<p>As the severity of financial distress increases, a firm's sales typically fall. An empirical study has found that the average reduction in profit of distressed firms is around 8% (as a percentage of the firm's market value) per annum. However, maximum losses could be as high as 80% of the firm's market value.</p> <p>Greater likelihood of bankruptcy leads firms to reduce their expenditure on capital investment as a result of financing constraints. For example, an empirical study found that over 80% of the sample of distressed firms reduced their CAPEX programme in the year after the onset of financial distress.</p> <p>Large firms and those firms with a higher proportion of tangible assets reduce investment more quickly in response to financial distress. This is attributed to the management of large firms having greater incentive to send a more positive signal to shareholders by reducing investment opportunities in order to improve the short-run perception of the firm's financial condition.</p>

Sources: Oxera analysis, based on empirical studies: Pindado and Rodrigues (2005), Chen and Merville (1999), Kuhurana and Lippincott (2000), John et al. (1992), Asquith et al. (1991).

Hypothesis: controlling for the severity of distress, more highly geared financial structures will lead to a greater reduction in firm-level output following the onset of distress

Empirical studies have found that a firm's choice of financing affects both its performance in its own product market and the conduct of other market participants. Indeed, some studies have found that financial gearing plays a more important role than poor performance at the firm and industry level in explaining the drivers of financial distress.

Firms that are more highly geared are likely to experience more severe financial distress as a result of a limited degree of flexibility to respond to any external shocks. The sales and investment programmes of such firms are likely to fall to a greater extent following the onset of difficulties. In particular, highly geared firms that sell specialised products may be more adversely affected following the onset of difficulties as a result of reductions in the available budget for the capital investment programme.

The onset of financial distress may have a greater impact on highly geared firms that operate in concentrated industries. In such industries, firms that are more financially secure may take advantage of the onset of a rival's distress to advertise or price their products in order to drive out distressed rivals. Distressed firms may not be able to respond to these predatory strategies as a result of financial constraints.

Table 6.6 Examples of findings on the impact of financial structure

Country	Findings
International	<p>Highly geared firms experience a greater reduction in sales during a recession than the average firm with a lower level of gearing operating in the same industry. This may be because, in recessions, highly geared firms concentrate on short-term strategies by increasing price–cost margins at the expense of future sales.</p> <p>An empirical study has found that if GDP were to fall by 1%, sales of highly geared firms would be 1.3% lower than the corresponding level of sales of less highly geared firms.</p> <p>Highly geared firms that undertake a high level of research and development are more affected than otherwise comparable firms in times of recession.</p>

Sources: Oxera analysis, based on various empirical studies. Campello (2003), Opler and Titman (1994), Chen and Merville (1999), Andrade and Kaplan (1998).

Hypotheses: greater dispersion of creditors reduces firm-level output following bankruptcy and a greater proportion of bank debt in a firm’s financial structure leads to smaller reductions in firm-level output following bankruptcy

Distressed firms that borrow from fewer banks or lenders are more likely to avoid entering into formal bankruptcy proceedings because individual lenders have a greater incentive to ensure that the firm continues as a going concern. Theoretically, firms with fewer bank relationships should have a stronger relationship with their bank(s), with the bank being more able to access information about the firm, thereby reducing monitoring costs. This would imply that the reduction in output following the onset of distress would be lower for these firms.

Firms with stronger relationships with their bank may be able to obtain either cheaper credit or have access to additional credit in comparison to firms with weaker relationships. This will depend on the distressed firms’ business and financial characteristics, with larger firms and distressed firms with a lower level of gearing being more likely to obtain additional financing.

Table 6.7 Examples of findings on the impact of complexity of financial structure

Country	Findings
Belgium	The ease with which distressed firms can obtain additional credit depends primarily on the size of the firm and its level of financial gearing.
Germany	Firms experiencing greater distress are more likely to take part in pool formation, whereby a group of lenders pool their individual claims relative to certain borrowers with the aim of reorganising the debt of the distressed borrower. Successful turnaround is more likely for those pools with fewer member banks.
UK	<p>Although sources of lending are fairly dispersed, liquidation rights have been found to be concentrated almost entirely in the hands of a main bank. This main bank typically has full control over the company in the event of default as a result of the bank’s liquidation rights applying to almost all the company’s assets.</p> <p>Although banks have an incentive to ensure that the distressed firm continues as a going concern, the typical response of banks to the onset of difficulties is a contraction of lending.</p>
International	<p>Distressed firms that borrow more from banks are more likely to renegotiate their debt without entering formal bankruptcy proceedings.</p> <p>Stock returns are significantly higher where debt is restructured privately. This suggests that the costs of distress are lower if a larger proportion of the distressed firms’ liabilities is made up of bank debt.</p> <p>An empirical study has found that bank debt comprises around 40% of total liabilities for those distressed firms that were successful in restructuring privately. In contrast, bank debt is significantly lower, at around 25%, for those that were not successful in restructuring.</p>

Sources: Fuss and Vermeulen (2005), Gilson (1997), Gilson et al. (1990), Andrade and Kaplan (1998), Hoshi (1990), Brunner and Krahn (2002), Chirinko and Elston (2006), Franks and Sussman (2005).

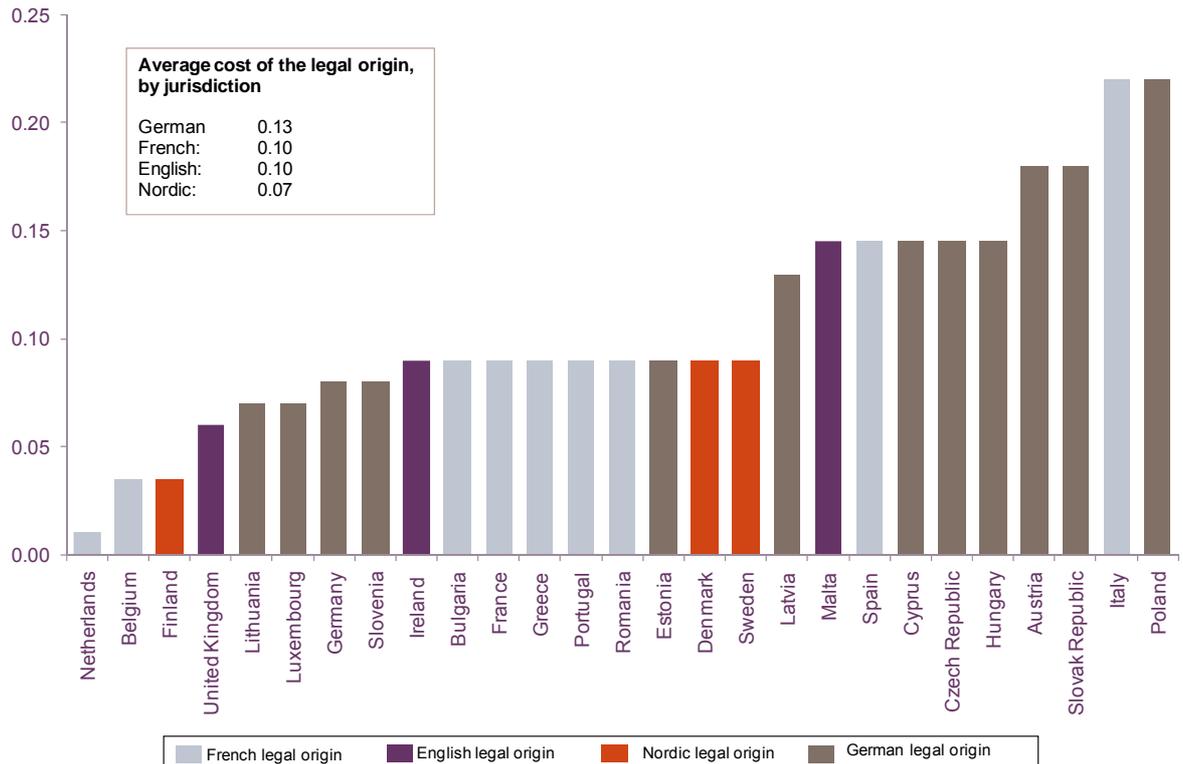
Hypothesis: firms that enter formal insolvency under more costly insolvency regimes will be more likely to reduce output

Existing empirical studies have focused on how the costs of distress vary across insolvency regimes. Studies, such as Djankov et al. (2008), have typically grouped insolvency regimes into four broad categories of legal origins: English, French, German and Nordic. These regimes differ in several important aspects, including the ability of creditors to enforce contractual provisions, shareholders' rights, as well as the quality of legal enforcement.

- **Creditors' rights.** The French legal origin offers creditors the weakest protection, while the English legal origin offers the greatest. In France, for example, the state imposes court-administered procedures in bankruptcy with the objective of preserving the firm as a going concern and maintaining employment. French bankruptcy courts are typically given control of the bankruptcy process and are not mandated to sell the firm's assets to the highest bidder, reducing the creditors' role to an advisory function. In contrast, under the English legal origin, secured creditors can veto court-administered bankruptcy procedures and enforce default provisions as stipulated in the debt contract. Creditors' rights under the Nordic and German legal regimes typically lie between the French and English ones.
- **Shareholders' rights.** A similar pattern emerges with regard to creditors' rights. Those countries under the UK legal origin offer shareholders the highest protection, while the French legal origin offers them the weakest protection. Under the UK legal origin, for example, shareholders are allowed to vote by mail, are less likely to block shares for shareholder meetings, have a higher incidence of laws protecting minorities, and require relatively less share capital to call an extraordinary general meeting. These measures reduce the control that could be exerted by insiders and improve the position of minority shareholders in the decision-making process. To the extent that this reduces ownership concentration, individual investors may have lower incentives to monitor the firm's managers, which may be associated with a higher likelihood of financial distress.
- **Legal enforcement.** Nordic countries typically achieve the most stringent enforcement of the bankruptcy code, with German countries close behind. Studies have shown that the Nordic and German legal origins provide the strongest enforcement. In principle, a strong system of legal enforcement might substitute for weak rules, since active and well-functioning courts might aid those investors with a minority claim.

Variation in the above features of the insolvency regime across legal origins can be seen through the range of estimates of the costs of distress across Member States. Figure 6.1 reports Djankov's (2008) estimates of the costs of debt enforcement proceedings, taking into account costs such as court/bankruptcy authority costs, attorney fees, notification fees and government levies. Figure 6.1 shows that bankruptcy costs vary from around 22% of firm value in Poland and Italy to 1% in the Netherlands.

Figure 6.1 Estimated costs of insolvency regimes as a percentage of the value of the insolvency estate (%)



Source: Oxera, based on Djankov et al. (2008).

As shown in Figure 6.1, the Djankov et al (2008) estimates of the cost of the insolvency regime illustrate that, on average across the EU, the costs of distress are higher under the German legal origin and lower under the Nordic legal origin. This is broadly consistent with other findings from empirical studies (reported in Table 6.8), which indicate that a firm is more likely to continue as an ongoing concern under the Nordic and English legal origins than under the German and French legal origins.

The likelihood that a firm survives the onset of distress is higher under the English legal origin than the French legal origin, as are the recovery rates, as shown in Table 6.8. This may be partly explained by the move by UK banks to manage distressed firms through centralised business support units leading to higher recovery rates. Banks may also adjust their lending patterns in response to the bankruptcy code, as shown by French banks tending to adjust to the creditor-unfriendly code by requiring greater collateral.

Table 6.8 Examples of findings on the impact of insolvency regimes

Country	% of going concerns	Recovery rates	Explanations	Bankruptcy costs
Nordic legal origin				
Sweden	75%	Ranges from 27% (piecemeal liquidations) to 39% (going concerns)	75% of firms survive as going concerns, either through pre-filing auctions or post-filing auction sales. In the remaining 25% of cases, firms' assets are liquidated piecemeal. Secured debt holders receive 69% of their claims while junior unsecured creditors recover only 2% on average. Recovery rates are lower the greater the proportion of intangible assets and in years with a general economic downturn. Of firms that continue as going concerns, 38% file for bankruptcy within four years (and 27% within two years).	6% of the pre-filing book value of assets
German legal origin				
Germany	Approx. 55%	Ranges from 40% (piecemeal liquidations) to 76% (informal renegotiations)	The median recovery rate is 61% in Germany. Based on a study of medium to large firms that default on bank debt. This broadly corresponds to the European Commission's definition of medium- to large-sized firms. The average age at which firms default is 15 years. ¹	8% of the value of the insolvency estate ⁵
Hungary	54%	Not available	The majority of firms (72%) that continue as going concerns make losses. The proportion of going concerns can be explained by remuneration to the trustee being based on sales turnover and income from asset sales. As a result, the scheme provides incentives to the trustee to postpone the sale of the firm's assets and administer the firm as a going concern.	15% of the value of the insolvency estate ⁵
German legal origins			German systems are associated with lower recovery rates and fewer going concern outcomes than common law systems, such as the UK legal origin.	
English legal origin				
UK	Approx. 60%	Ranges from 68% (piecemeal liquidations) to 78% (informal renegotiations and going concerns)	The median recovery rate is 82% in the United Kingdom. Some studies find that defaulted firms are less likely to survive as going concerns under English legal origin, as secured creditors have wide discretion to sell their collateral. ⁶ Another study finds the proportion of ongoing concerns is higher in the UK than in France, as a result of UK banks having strong incentives to maximise total recovery in the event of a default. ¹ The average age at which firms default is 7 years.	6% of the value of the insolvency estate ⁵
French legal origin				
France	Approx. 38%	Ranges from 40% (piecemeal liquidations) to 83% (informal renegotiations)	The median recovery rate is 39% in France. French banks respond to a creditor-unfriendly code by requiring more collateral than lenders elsewhere, and by relying on collateral forms that minimise the statutory dilution of their claims in bankruptcy.	9% of the value of the insolvency estate ⁵

Note: ¹ This finding from Davydenko and Franks (2008) is based on a sample of firms that broadly corresponds to the Commission's definition of medium- to large-sized firms. The sample comprised firms with annual sales turnover of less than €75m and total outstanding debt with the participating bank of more than €100,000. ² This finding from Franks and Sussman (2005) is based on a sample of firms that broadly corresponds to the Commission's definition of small- to medium-sized firms. ³ These findings are based on a sample of firms that broadly corresponds to the Commission's definition of medium- to large-sized firms. ⁴ These findings are based on a sample of firms that broadly corresponds to the Commission's definition of medium- to large-sized firms. ⁵ These estimates of the cost of the insolvency regime have been obtained directly from Djankov, et al. (2006). ⁶ Hart (2002). Sources: Thorburn (2000), Stromberg and Thorburn (1996), Ravid and Sundgren (1998), Franks and Loranth (2006), Franks and Sussman (2005), Davydenko and Franks (2008), Kaiser (1996); Smith and Stromberg (2005), Franks and Torous (1994), Andrade and Kaplan (1998), Thorburn (2000), and Hart (2000).

Hypothesis: greater asset substitutability (whether a firm’s assets can be bought by another company) will lead to smaller reductions in firm-level output following the onset of distress

Distressed firms with a greater proportion of specific assets that cannot readily be deployed to alternative uses are less likely to survive the onset of financial difficulties. As this restricts the ability of distressed firms to dispose of poorly performing business divisions, the impact of distress on output may be greater for these firms.

Table 6.9 Examples of findings on the impact of asset substitutability

Country	Findings
Sweden	Customers are more likely to withdraw their business from distressed firms that sell more specialist products. The reduction in sales of distressed firms that undertake research and development activities (18%) is greater than for otherwise comparable distressed firms (14%).
UK	Within a distressed industry, recovery rates are lower for those firms with a greater amount of specific assets. Recovery rates are lower if the industry is in distress and firms have a greater amount of more specific assets (and, hence, are less likely to be purchased by another firm).
International	If a firm’s assets are more specific to a particular firm or industry, there is a higher likelihood that bankruptcy auctions result in assets being sold for less than their fundamental value.

Sources: Stromberg (2000), Acharya et al. (2006).

6.3.2 Implications for the regional and industry level

Existing studies have been examined to provide insights into the impact of financial distress on regional- and industry-level outcomes following the hypotheses outlined in section 2.3.

Box 6.4 Key observations

Firm and sector characteristics

- The size of the bankruptcy matters—larger bankruptcies result in greater industry contagion.
- Rival firms may pursue predatory output strategies in response to a firm in the industry experiencing financial distress, in an attempt to drive firms out of the market.
- If clusters of firms in a particular industry go into distress this can have implications for firms that are linked in the product market (industry rivals) and for those connected along the supply chain (customers and suppliers).
- The transmission of financial distress from the firm in difficulty to suppliers or customers increases with the level of product market specialisation.
- When suppliers to a firm in distress have fewer opportunities to switch customers, the effect of the bankruptcy on the region or industry is greater.
- Creditors recover less if the industry is characterised by illiquid and specific-assets.
- The impact on suppliers of a firm going into financial distress or filing for bankruptcy is much greater than on customers.

Workforce and labour market characteristics

- High levels of labour market flexibility may mitigate to some extent the impact of financial distress or bankruptcy on regional outcomes.
- Research comparing jurisdictions with low and high job security provisions shows that, in jurisdictions with more stringent job security provision, employers vary their utilisation of employees rather than using redundancies to reduce costs.

Hypothesis: certain firm characteristics are associated with a reduction in industry/regional output

Bankruptcy leads to loss of firm- or industry-specific capital and skills when resources are re-deployed to other firms, with further costs arising as a result of output being lost during the time it takes workers to relocate. This negative impact on the industry and region increases in line with the size of the bankruptcy.

The threat of bankruptcy may also affect firms' output decisions, with rival firms having an incentive to pursue predatory output strategies when a firm in the same industry experiences financial distress. This incentive arises because a firm's financial condition is likely to improve if one or more rivals are driven into financial distress.

Firms that are highly geared have an incentive to pursue more aggressive output strategies than those with lower levels of gearing. At higher levels of gearing, the likelihood of default increases. As there is no requirement on the distressed firm to pay any returns to equity holders in the event of bankruptcy, equity holders may pursue higher risk strategies as gearing increases to maximise the potential for any payoffs.

The transmission of financial distress from the industry of the firm in difficulties to the industries of suppliers or customers increases with the degree of product specialisation. For example, suppliers of specialised products to a distressed firm may find it difficult to substitute the lost sales. In this way, the impact of financial distress may propagate from one firm or industry to another. Similarly, if the firm in difficulties is itself the producer of a specialised product, a reduction in output following the onset of financial distress may have detrimental effects on customers, thereby transmitting the impact of the financial distress along the supply chain.

Table 6.10 Examples of findings on the impact of firm-level characteristics

Country	Findings
International	<p>Changes in the financial structure alter the distribution of returns received by debt and equity holders and may change the output strategy favoured by equity holders.</p> <p>As firms increase gearing, they have an incentive to pursue output strategies that raise returns in good states and lower returns in bad states. This arises as equity holders have less incentive to secure returns in bankrupt states since debt holders will be paid before equity holders in the event of bankruptcy.</p> <p>Firms that are more highly geared are more likely to pursue aggressive output policies. As gearing increases, the likelihood of default also increases. As a result, equity holders may pursue higher-risk output strategies, with the net effect on the industry potentially being over-production.</p> <p>Larger bankruptcies have a greater impact on the returns of the distressed firm's rivals. Similar effects are also present in the returns of rivals to the filing firm in the period of financial distress leading up to the bankruptcy.</p> <p>Suppliers of unique or specialised products to a firm filing for bankruptcy suffer greater negative stock price reactions at the time of the bankruptcy.</p> <p>Similarly, customers of filing firms that sell specialised products suffer more negative returns at the time when the distressed firm files for bankruptcy. Contagion effects for suppliers are greater when the filing firm does not emerge successfully as an independent entity.</p>

Sources: Brander and Lewis (1985 and 1988), Hertz et al. (2008).

Hypothesis: certain sector characteristics are associated with a reduction in industry/regional output

The level of interaction between suppliers and customers of the firm in distress has an important influence on regional- and industry-level outcomes. When suppliers to a firm in distress have fewer opportunities to switch customers, the effect of the bankruptcy on the supplying company is greater. The adverse impact on the supplying firm increases if the firm has contracts with rivals of the distressed firm and if industry contagion further creates a negative impact on rival firms.

If an announcement of bankruptcy conveys negative information about the state of an industry, negative stock price effects on wider firms in the industry are likely to arise (contagion effects). On the other hand, if the demise of a rival results in a positive effect on the surviving firms, the firm's bankruptcy may have positive stock price effects on the industry (competitive effects). Empirical studies have found that competitive effects are greater in industries that are less concentrated and where the average level of gearing is higher.

Table 6.11 Examples of findings on the impact of sector characteristics

Country	Findings
International	<p>In less concentrated industries, stock returns are more negative (−2%) than in more concentrated industries as a result of effects from competition.</p> <p>In industries with above-average financial gearing, the industry stock responses are more negative (−3%) than those with below-average gearing. This may be because in industries where gearing is relatively high, individual firms are at greater risk of bankruptcy, and therefore the contagion effect is stronger. In contrast, in concentrated industries with low levels of gearing, stock reactions are positive (around +2%).</p> <p>Rival firms in concentrated industries may benefit from being able to sell their goods at higher prices. However, they may also be able to expand production to obtain market share from the bankrupt firm, which would imply that industry output would fall by a lower amount than the reduction in output from the bankrupt firm.</p> <p>Creditors recover less if the industry is in distress and non-defaulted firms in the industry are illiquid, particularly if the industry is characterised by assets that are specific, and if the debt is collateralised by specific assets. This may lead to a greater reduction in industry output following the onset of financial distress at the firm level.</p> <p>In industries where demand is falling, firms may experience difficulties as a result of excess capacity in the industry. The gains from redeploying assets in such industries are relatively small.</p>

Sources: Lang and Stulz (1992), Hertz et al. (2008), Opler and Titman (1994), Maksimovic and Phillips (1998).

Hypothesis: certain labour market characteristics are associated with a reduction in industry/regional output

A high level of labour market flexibility is often regarded as a means of mitigating the adverse impact of financial distress or bankruptcy on industry or regional outcomes. If there is a high degree of flexibility in the labour market, firms that experience difficulties are more easily able to reduce their cost base through redundancies. For example, strong labour rights may prevent employers from adjusting to economic fluctuations and changes in demand conditions, thus exacerbating any difficulties faced by firms during downturns.

Some empirical studies that have compared German, French and Belgian manufacturing sectors to that in the USA have shown that firms in Europe are more likely to decrease employee utilisation, reducing the number of hours worked, than using redundancies to reduce costs.

It is not only labour market rigidities that have been found to affect employment outcomes. Capital market imperfections have been associated with a greater reduction in employment following the onset of distress, which may potentially lead to structural unemployment problems.

Table 6.12 Examples of findings on the impact of labour market characteristics

Country	Findings
Italy	<p>Investment is negatively related to the level of national labour market regulation. Firms that are able to access financial markets are in a position to determine their optimal investment policy, even in the presence of stringent employment protection laws.</p> <p>Large enterprises are more affected than smaller ones by the degree of labour market regulation. Regulation increases the cost to the firm of expanding or reducing its capital stock and limits its ability to respond to changes in fundamentals.</p>
Europe	<p>Strong job-security provisions, by restricting redundancies during downturns, may reduce employers' willingness to hire during upturns.</p> <p>Studies comparing the German, French and Belgian manufacturing sectors to that in the USA have shown that, while adjustments to employment to changes in output in Europe are much slower than in the USA, the adjustment in the number of hours worked to changes in output is similar. This suggests that, despite more stringent job-security provisions in Europe, employers across Europe have developed alternative strategies that provide sufficient flexibility in order to enable adjustments to their labour policy at times of changes in demand.</p>

Sources: Facolta di Economia (2009), Abraham and Houseman (1994), Platt and Demirkan (2009), Belke and Fenh (2001).

Hypothesis: for a given industry in a given region, there is an impact on industry/regional output of a cluster of firms in that industry going into distress

Financial distress can have implications for firms that are linked in the product market (industry rivals) and for those connected along the supply chain (customers and suppliers). Feedback effects can arise when rivals, customers and suppliers respond to the firm's distress.

Studies have shown, however, that the impact on suppliers of a firm going into financial distress or filing for bankruptcy are much greater than on customers. This suggests that customers may anticipate the financial distress of a supplier and take actions to alleviate the consequent impact on their own business.

There is some evidence that large restructurings may result in beneficial outcomes if those firms that are liquidated represent some of the least productive in an industry. Research has shown that, while such restructurings result in short-term losses to the industry, once capital and labour have been redeployed to the surviving, more productive firms, aggregate output increases after three years following restructuring.

Table 6.13 Examples of findings on the impact of a cluster of firms entering financial distress

Country	Findings
France	<p>Firms whose customers default are themselves more likely to default.</p> <p>Credit-constrained firms pass a significant proportion (more than one-fourth) of their liquidity shocks on to their suppliers through trade credit. The chain of defaults stops with firms that are large, liquid and have access to financial markets; such firms typically do not pass on trade credit defaults.</p>
International	<p>The probability that suppliers of distressed firms go into distress ranges between 4% and 13%, depending on the business cycle and the underlying strength of the economy.</p> <p>In the period leading up to bankruptcy and at the time of the bankruptcy itself, returns of firms supplying the firm in distress decline, and to a greater extent if there are contagion effects within the industry. This effect may be because there are fewer opportunities for suppliers to switch customers when the industry of the filing firm is impaired. Another explanation is that suppliers to the filing firm have wider economic relations with the rivals of the filing firm, which also suffer when there is industry contagion.</p> <p>Similar effects on returns are not found for customers of firms facing financial distress or bankruptcy. This effect is observed in both industries that exhibit contagion and those that do not. This suggests that customers anticipate the financial distress of a supplier and take actions to alleviate the impact on their business.</p> <p>Restructuring may reduce the country's aggregate output to below its initial level in the very short run, but raise it above its initial level in the medium term.</p> <p>In a benchmark case where the least-productive firms, representing 5% of total labour, are liquidated and the freed-up resources are reallocated to more productive firms, aggregate output was found to decline by 0.8% below the initial level in the year of restructuring. This largely reflects the short-run output loss due to the closure of the least-productive firms. Aggregate output was found to exceed its initial level starting from the third year after restructuring, as a large proportion of the labour and capital released from the least-productive firms is re-employed by more productive firms.</p>

Sources: Boissay and Gropp (2007), Boissay (2006), Kim (2003), Hertzel et al. (2008).

6.4 Summary of key findings

Existing empirical studies provide strong evidence that firms typically reduce output and employment following the onset of financial distress. Initially firms reduce their reliance on temporary workers before considering changes to permanent staffing levels. The extent to which distressed firms reduce their workforce in response to the onset of difficulties depends to a large degree on the flexibility of labour market legislation.

The reduction in employment and output after the onset of financial difficulties is greater for firms that are more severely distressed, face difficulties accessing external sources of funds, are more highly geared and have a substantial proportion of assets that cannot easily be transferred to alternative uses. The impact of distress on firm-level outcomes will also vary according to the insolvency regime, with survival rates being higher for firms operating under the UK insolvency regime than under the French or Nordic legal origins.

Job losses at the firm level are predominantly influenced by the characteristics of the workers themselves. Employees that are older, less educated and work in manual occupations are more likely to be displaced following the onset of difficulties at the firm level.

The extent to which reductions in output at the firm level following the onset of difficulties affect outcomes at the industry and regional level depends on the size of the firm, with larger bankruptcies introducing greater contagion across firms and their suppliers, as well as the level of integration across firms within the industry and the degree of product specialisation. If the product is highly specialised, rival firms will not be able to readily gain market share from the distressed firm, with the result that the negative impact on the wider region will be expected to be greater.

A significant proportion of displaced workers are still unemployed three years after losing their jobs. The ease with which displaced workers are able to find alternative employment depends more on the characteristics of the employees, such as their level of skills, and features of the regional labour market, rather than firm- or sector-specific characteristics. In these cases, workers who are displaced are likely to experience significant difficulties finding alternative employment and are more likely to remain unemployed in the long term, with implications for the level of economic activity in the region.

7 Implications of financial distress for regional- and industry-level output and employment based on empirical analysis

7.1 Introduction to regional- and industry-level effects

This section examines the wider effects of financial distress, including the impact on output and employment within the regions and industries where the distressed establishments are located.¹²⁸

Box 7.1 Key observations from the empirical analysis and case studies

Wider employment effects—the empirical analysis suggests the following.

- Redundancies at distressed establishments appear to be associated with reductions in employment within the industries and regions where the distressed establishments are located.
- Following redundancies at distressed establishments, the reduction in employment in the same industries and regions is typically greater than the number of redundancies at the distressed establishments. This suggests that displaced workers may experience difficulties finding alternative work in the same industry in the affected region.
- These wider negative effects are reinforced in industries with spare capacity. This may indicate that displaced workers face greater difficulties finding re-employment if demand conditions are relatively unfavourable.
- The effect of redundancies is reinforced if distressed establishments are part of industries characterised by low labour productivity, which may be indicative of relatively low capital intensity. To the extent that low productivity is also related to low skill levels, this may indicate that the skills of employees in such industries are less readily transferable to alternative employment.

The case studies suggest that the following.

- The wider effects of redundancies appear to be greater within the establishment's immediate industry and neighbouring area, rather than in the wider region.
- Following redundancies at a distressed establishment, there is some indication that the proportion of workers taking early retirement increases.
- Local unemployment does not appear to be greatly affected by the consequences of distress at an establishment. This may be due to employees finding work in other industries or due to their exit from the workforce through early retirement.

Wider output effects—the empirical analysis suggests the following.

- Prior to the onset of distress, industries with distressed establishments tend to perform less well than industries at the national level.
- Following the onset of distress, there appears to be no noticeable underperformance in industries with distressed establishments compared with national trends. This is consistent with findings that firms' revenues quickly rebound after the onset of difficulties.
- The empirical analysis shows that the impact of financial distress on regional and industry output cannot be distinguished from wider economic trends. However, empirical studies (reviewed in section 6) have indicated that wider output effects depend on a number of firm-specific factors, such as its size, the structure of the industry, such as the level of integration between firms within the industry, the nature of competition and the degree of product specialisation. (See sections 6.2.2 and 6.3.2 for further discussion of the results from existing empirical studies.)

¹²⁸ The analysis in this section has been undertaken at the establishment level—ie, an economic unit at a single physical location. This unit of observation is most relevant when assessing the impact of outcomes from distress on the wider region and industry.

The impact of financial distress at an establishment could be transmitted to other firms, regions or industries through a number of channels, such as:

- industry- or establishment-specific skills might not be readily transferable, which restricts the re-employment possibilities of displaced workers;
- competitors might not be able to re-employ the dismissed workers or gain additional market share from the distressed establishment;
- geographic labour mobility might be limited, at least in the short term, preventing displaced workers finding jobs elsewhere;
- reduced activity at the distressed establishment might have negative impacts on suppliers;
- redundancies might reduce the incomes of displaced workers and hence their consumption, which would have negative knock-on impacts on employment and activity in the local economy.

The wider effects on employment and output could be quite substantial. For example, the empirical analysis presented in this section finds that redundancies of about 200 workers at the distressed establishment are associated with a decline in employment in the same industry within the affected region by around 1,000 jobs in the same year.

Such wider effects will be more persistent if the industry or region is in structural decline, reducing the re-employment prospects of workers within the region or industry. Regional jobs and output might be lost permanently if, for example, an establishment is a major employer in a region and the specificity of employee skills and assets prevent the efficient redeployment of resources within the region or the industry.¹²⁹ For instance, a major case of financial distress in the automotive industry might be expected to result in a reduction in output and employment in the region in which the car plant is located, at least in the short term. Output and employment in that industry might also be expected to fall following the onset of distress, both in the region and, in large cases, nationally. However, there are many influences on employment at the regional and industry level over time (some of which are partly unobservable from the data available, or the impacts cannot be separately identified from the data available). It is therefore important to delineate the impact of the marginal effects of financial distress at the establishment on regional and industry outcomes from wider economic and market trends.

The empirical analysis in this section is supplemented with insights from case studies (section 7.6), together with findings from existing empirical studies on re-employment prospects for displaced workers (as set out in section 6). This provides insights to address the Commission's questions regarding the wider effects of financial distress in terms of changes in output and employment at related firms (eg, competitors) and the average impacts on regional output and employment rates.

The remainder of this section is structured as follows. The dataset used in the empirical analysis and the approach are considered in sections 7.2–7.3; findings of the impact of financial distress on regional- and industry-level employment and output are presented in sections 7.4–7.5; the insights obtained from selected case studies are outlined in section 7.7, and the overall conclusions presented in section 7.8.

7.2 Dataset for the empirical analysis

To analyse the impact of financial distress on the wider region and the industry, the dataset would need to contain information on the physical location of the economic unit where workers are displaced and output is reduced. For each establishment, the dataset would need to identify the change in output at the time of distress and the number of redundancies after the firm experienced distress.

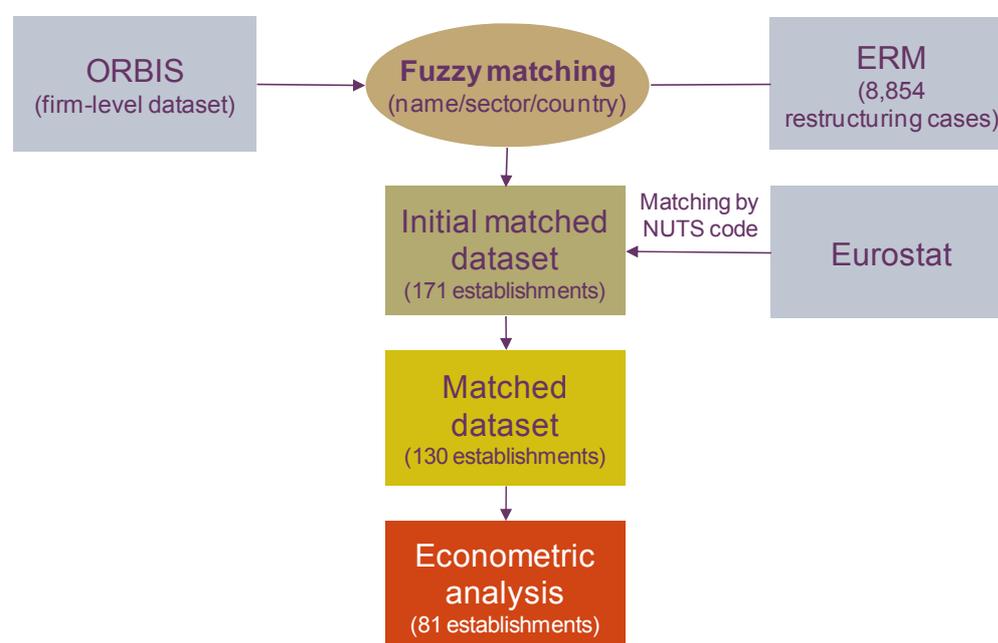
¹²⁹ Based on results from the case studies, existing empirical studies and the empirical analysis reported in this section.

As there is no single database that contains all this information, a number of potential approaches were considered to ensure the robustness of the analysis (see section 4.5.1). The ORBIS database that is used for the firm-level empirical analysis is the most representative in terms of coverage of Member States and listed and unlisted firms, but it does not provide information on the location of the job losses. Therefore, the firm-level information from ORBIS has been combined with data on job losses (and their location) from the European Restructuring Monitor (ERM) and information on regional and industry employment from Eurostat, in order to construct a database that can be used for the regional- and industry-level analysis. The ERM records job losses across Europe that have been publicised, and, importantly, the database also records the locations of the job losses.

The firm-level information from ORBIS has been matched with information from the ERM on the basis of the company name using a fuzzy matching algorithm.¹³⁰

Once the data from ORBIS had been matched with ERM, the dataset was matched to regional- and industry-level data from Eurostat, as outlined in Figure 7.1.

Figure 7.1 Matching data from ORBIS, European Restructuring Monitor and Eurostat



Source: Oxera.

The matching process provided an initial matched dataset containing 171 establishments. This dataset has subsequently been cleaned—in particular, by excluding cases where the redundancies recorded in the ERM occur more than four years after the onset of distress and therefore a link between the onset of distress and the observed redundancies appears to be weak. This results in a set of 130 establishments. However, due to missing data in Eurostat, only a sub-set of 81 establishments is available for the econometric analysis.

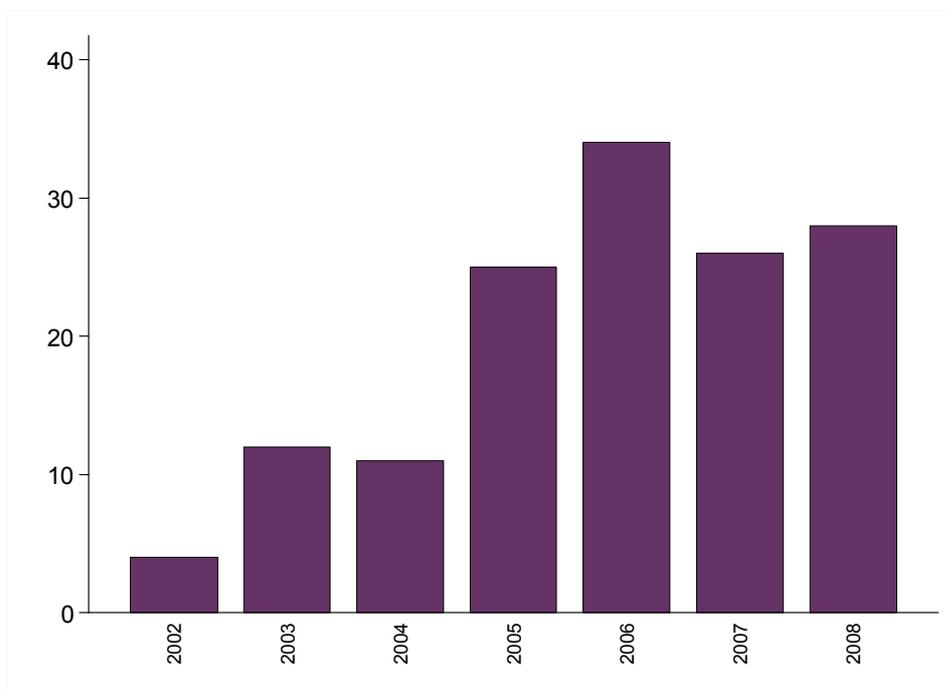
7.2.1 Coverage of the dataset for the regional- and industry-level analysis

The number of establishments contained within the matched sample used for the regional- and industry-level is mainly a result of the limited overlap of years covered in both datasets—the sample of distressed firms identified from the ORBIS dataset covers the period from 1995

¹³⁰ The ORBIS dataset and the European Restructuring Monitor dataset do not contain a common identifier, such as a company registration number. Therefore, the two datasets have been matched on the basis of the company name. The names were initially standardised to ensure similarity across the two databases. A fuzzy matching algorithm was then subsequently used. To ensure the robustness of the methodology, cross-checks were undertaken on the matched dataset.

to 2005, while the ERM dataset records redundancies that occurred in 2002 or later, with the majority of records from 2005 onwards.¹³¹

Figure 7.2 Number of announcements of redundancies, by year



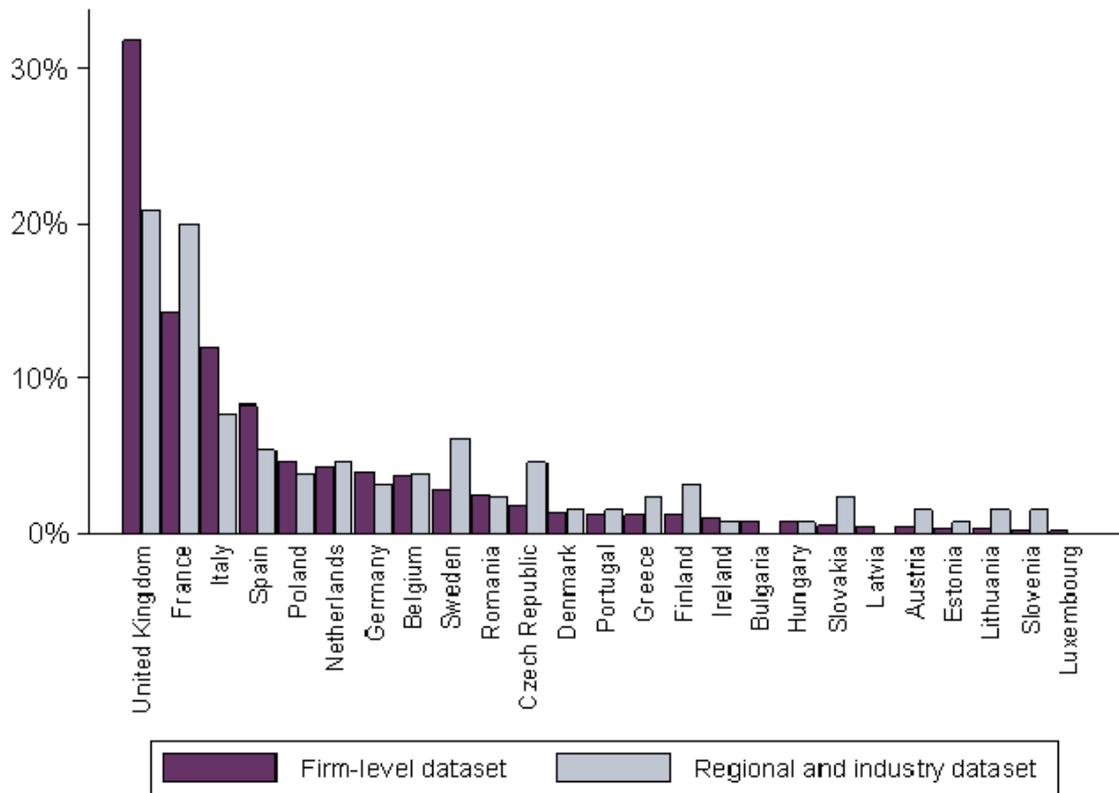
Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

As shown in Figure 7.2, the majority of cases in the matched sample occur in 2005 or afterwards, reflecting the composition of the ERM dataset (see section 4.5).

Figure 7.3 illustrates that the coverage of the matched sample used for the regional and industry analysis broadly corresponds to the sample for the purposes of the firm-level analysis. However, the focus on companies domiciled in the UK or France is somewhat less pronounced in the sample for the regional and industry analysis.

¹³¹ ERM provides information on the first year in which dismissals begin and the date of the announcement of the dismissals. In the empirical analysis, the first year in which dismissals begin has been assumed. In cases where such information was not available, the year of the announcement of dismissals has been assumed instead.

Figure 7.3 Comparison of the coverage across Member States in the firm-level dataset with redundancy announcements in the regional and industry dataset (% of firms)



Source: Oxera analysis, based on ORBIS and ERM data.

Consistent with the application of state aid across Member States, the sample comprises firms from the manufacturing industry (78% of the sample), with 14% from the wholesale/retail trade and transport industry, and the remainder from financial services, real estate and construction.

As a result of the size of the matched sample used for the regional- and industry-level analysis, Oxera has adopted a tiered approach to examine the impact of financial distress on regional- and industry-level outcomes. The findings from the empirical analysis have been supplemented with insights from the case studies and findings from existing empirical studies.

7.3 Specification of the approach

The overall objective of this analysis is to assess the extent to which changes in output and employment at large distressed establishments are associated with output and employment outcomes at the industry and regional level.

A two-staged methodology has been adopted: the first investigates whether wider impacts on regional or industry outcomes can be observed; the second then assesses whether changes in regional outcomes can be associated with certain regional, industry or economy-wide characteristics.

7.3.1 Identifying the impact of financial distress on regional and industry outcomes

The impact of a change in employment and output at distressed establishments on regional and industry outcomes may be smaller than (mitigating effects), equal to (the base

hypothesis), or greater than (reinforcing effects) the level of redundancies at the distressed establishment. The starting hypothesis, which is tested in this analysis, is that a change in employment and output at distressed establishments is associated with the same change in employment and output in the industry or region.

The overall impact of a given loss in employment at a distressed establishment on regional outcomes cannot be easily established purely on theoretical grounds; rather, it needs to be assessed empirically. For example, in addition to firm-specific drivers of distress, there may be cyclical and structural economic and/or demographic trends that may reinforce or counteract the initial loss of employment at the establishment. For example, during a recessionary period, suppliers are likely to have greater difficulties finding new buyers for their outputs, and displaced workers may find new jobs less readily than in a period of strong growth.

7.3.2 First-stage analysis: wider impacts on regional- and industry-level outcomes

This first stage examines whether financial distress is associated with a certain pattern of economic activity outcomes at the regional or industry level. The analysis seeks to establish whether there is a positive or negative relationship, or no association, between regional outcomes (relating to industry employment and regional GVA) and outcomes at large, distressed establishments.

The evolution of regional and industry output and employment around the announcement of redundancies has been examined, comparing observed changes with wider trends in employment and output to ascertain whether the observed changes can be associated with the impact of distress at the establishment. This approach is conceptually similar to an event study.¹³²

The aim of this stage is to examine whether there is an association between industry/regional outcomes and establishment outcomes.

7.3.3 Second-stage analysis: exploring compensating and reinforcing effects

The second stage examines whether changes in regional outcomes are associated with certain regional, industry or economy-wide characteristics. The impact of financial distress on regional and industry outcomes is examined, together with the drivers of any observed compensatory or reinforcing effects.

Econometric analysis has been undertaken in an attempt to explain the drivers of any observed compensatory or reinforcing effects. This analysis seeks to provide an indication of the direction of the findings, rather than to enable an exact quantification of the impact of redundancies. This is because, with a relatively limited sample, it is not possible to obtain precise estimates of the impacts.

7.3.4 Treatment of causality between firm-, regional- and industry-level outcomes

The empirical firm-level analysis (discussed in section 5) that examines the drivers of firms' survival as well as the impact on output and employment at the firm-level found that sector performance did not significantly influence the likelihood of firms' surviving the onset of distress, or changes in employment and output post-distress. This suggests that the likelihood that firms survive the onset of distress, as well as the evolution of firms' performance post-distress, is driven to a greater extent by firm-specific characteristics, rather than conditions relating to the performance of the sector.

The direction of causality—for example, whether distress at the establishment has an adverse impact on the region and/or industry or whether distress in the region and/or industry has an adverse impact on the establishment—can in principle be established using formal statistical tests; however, this would require a more extensive database. Therefore, in this

¹³² Depending on the type of analysis, the comparison is undertaken with trends in the wider region /industry or the national level.

section, it is not explicitly assumed that difficulties at the establishment have an adverse impact on the wider region and/or industry. Rather, the analysis focuses on the association between outcomes at the establishment level and the region and industry level.

Nevertheless, the results discussed in this section would be expected to hold irrespective of the direction of causality. For example, even if the performance of the local industry or region represented the predominant driver of the distress at the establishment, the negative impact of distress would still be expected to be magnified in those regions and/or industries where there is spare capacity and a relatively low skills base.

7.4 Analysis of implications for employment

Box 7.2 Key observations from the empirical analysis

Wider regional employment effects

- Redundancies at distressed establishments appear to be associated with declines in employment within the industries and regions in which the establishments are located.
- Following redundancies at distressed establishments, the reduction in employment in the same industries and regions is typically greater than the redundancies at the distressed establishments. This suggests that displaced workers experience difficulties finding alternative work in the same industry in the affected region.

Wider industry employment effects

- Redundancies at distressed establishments seem to be associated with declining employment within the industry in which the distressed establishments are located.
- Employment in industries containing distressed establishments grows more slowly than national trends, both before, at and one year after the onset of distress.
- Two years after the redundancies, growth in employment in distressed industries is similar to national trends.
- These wider effects are reinforced in industries where there is spare capacity. This suggests that if demand conditions are relatively unfavourable, displaced workers may face greater difficulties finding re-employment.
- The effect of redundancies is reinforced if distressed establishments are part of industries that are characterised by low labour productivity, which may be indicative of relatively low capital intensity. To the extent that low productivity is also related to relatively low skill levels, this might also indicate that the skills of employees in such industries are less readily transferable to alternative employment opportunities.

7.4.1 First-stage analysis: wider impacts on industry employment in the affected region

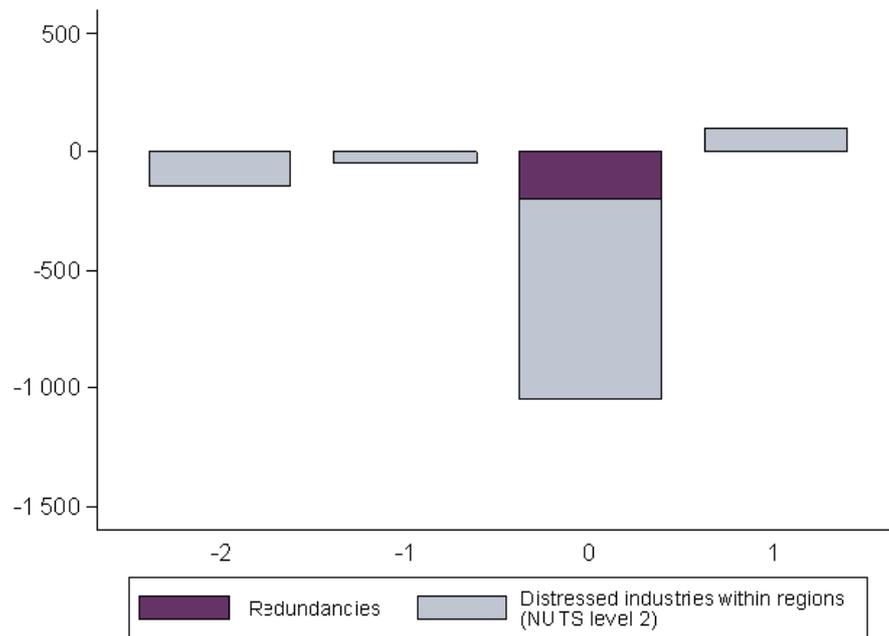
The wider effects of job losses at distressed establishments may manifest themselves in employment losses at the regional or the industry level. There is some evidence that redundancies at distressed establishments are associated with declining industry employment within regions where the distressed establishments are located ('the affected regions').

Figure 7.4 illustrates the evolution of employment in distressed industries within those regions where redundancies take place at the distressed establishment. As shown in the figure, prior to the redundancies (depicted in the figure as occurring in year 0), only minor changes in industry employment in the affected regions can be observed—on average, employment falls by about 150 employees two years prior to redundancies and by around 50 employees in the year immediately before the redundancies at the distressed establishment.

Redundancies at the distressed establishment occur at year 0, as shown in Figure 7.4. This is associated with a marked reduction in industry employment within the affected regions at the time of redundancies at distressed establishments. For example, industry employment in

affected regions appears to fall by around 1,050 workers compared with average redundancies of around 200 employees.

Figure 7.4 Average change in employment in affected regions in the same industry (number of workers)



Note: The figure reports median job losses.
Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

This illustrates that industry employment in affected regions falls by more than the redundancies at the distressed establishments. This suggests that displaced workers may experience difficulties finding alternative employment in the same industry and region, and as a result, may be forced to find alternative employment elsewhere, either in other industries or other regions.

Impact on regional employment

The results presented so far suggest that distress-related redundancies appear to be associated with wider effects on industry employment within the affected regions.

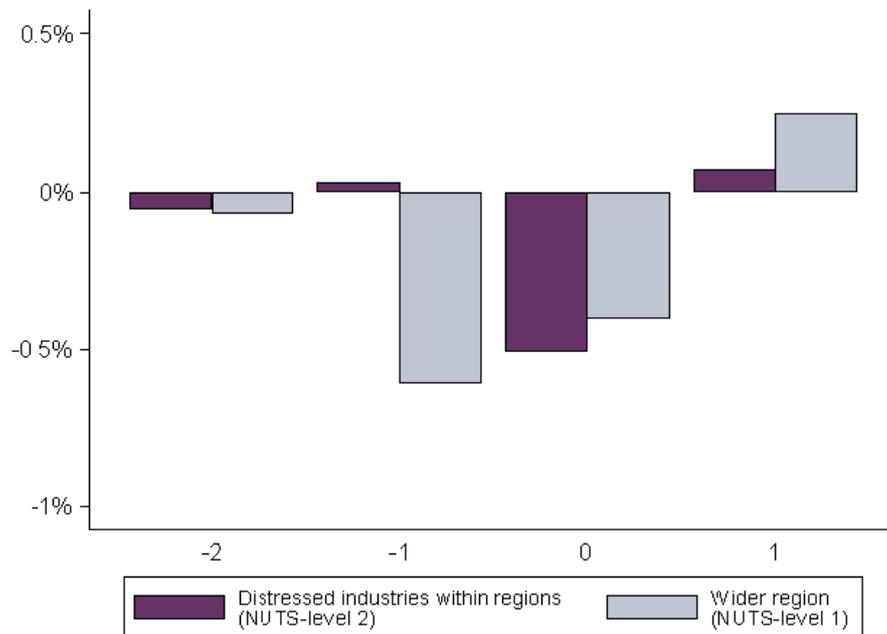
To examine whether the observed reduction in regional employment reflects the redundancies at the distressed establishment or wider macroeconomic trends, the evolution of employment in regions and industries where distressed establishments have dismissed workers has been compared with wider trends in employment. This is because wider regions are unlikely to have been as greatly affected by the onset of distress at a particular establishment.

The evolution of regional employment (in the same industry) has been compared with average growth in employment in the wider region (in the same industry), as shown in Figure 7.5. Prior to redundancies at the distressed establishments (denoted as year – 1 in Figure 7.5), employment in the wider region was falling, while, in contrast, there was little change in employment in the immediate industries within the regions containing the distressed establishments. To an extent, this may suggest that distress in the wider region may have spilled over to the immediate region.

At the time of the redundancies (shown in year 0 in Figure 7.5), both the distressed region and the wider region experienced similar negative growth in employment. However, in the year after the redundancies took place at the distressed establishments, industry

employment in the distressed region was found to grow less strongly. This provides some indication that redundancies at distressed establishments may have a reinforcing impact on employment at the regional level (in the same industry).

Figure 7.5 Evolution of regional employment in the same industry (average year-on-year growth in employment)



Note: The figure reports median changes in employment.
 Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

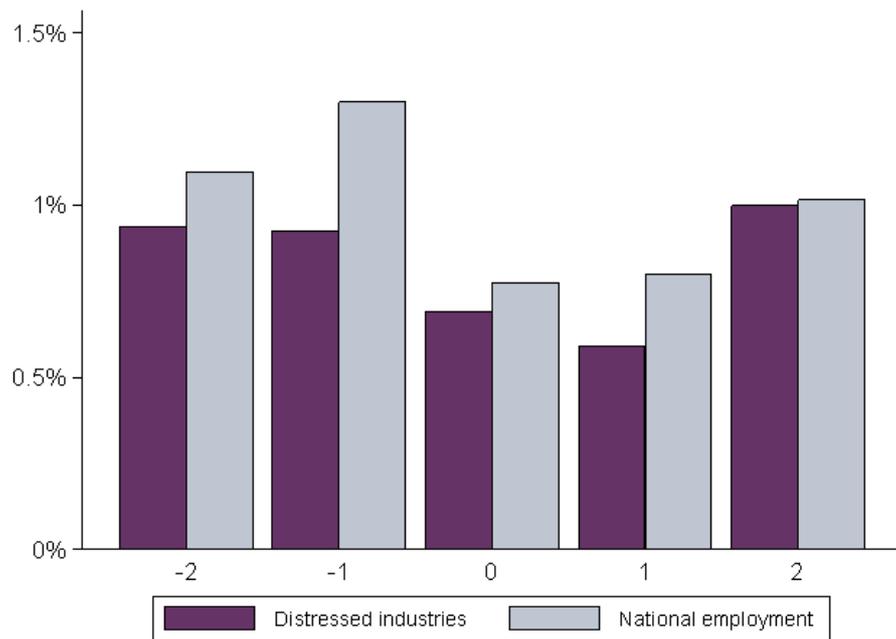
It should be borne in mind that the above analysis relies on point estimates (ie, a comparison of average changes in employment at distressed establishments with employment in the wider industry or region). While this provides an indication of the size and direction of any effects, as a result of the size of the sample, there is some degree of uncertainty around these point estimates. Therefore, some caution is required when drawing inferences from this analysis about the impact of distress in the population of establishments.

Impact on industry employment

To examine the potential wider industry effects arising from job losses at distressed establishments, growth in employment in industries affected by distress has been compared with growth in national employment.

Figure 7.6 compares the evolution of employment at distressed industries with national trends around the time when redundancies took place at the distressed establishments (as indicated by year 0 in the Figure).

Figure 7.6 Evolution of industry employment (average year-on-year growth in employment)



Note: The industry output data provided by Eurostat does not cover the complete set of Member States examined in this report—in particular, no data is available for Austria and the UK. The figure reports median changes in employment.

Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

Figure 7.6 illustrates that employment growth in industries that include distressed establishments is slightly lower than national employment trends, both before, at and one year after the redundancies took place at the distressed establishments. However, two years after these redundancies, growth in industry employment was found to be similar to national trends. This is consistent with findings from the firm-level analysis (reported in section 5) that firms’ revenues quickly rebound following the onset of distress.

7.4.2 Second-stage analysis: exploring compensating and reinforcing effects at the industry level

The next step is to examine whether the observed declines in employment within affected regions may result from the wider effects of redundancies related to financial distress or other factors (such as macroeconomic conditions). To do this, factors that may explain the differences between the level of redundancies at distressed establishments and changes in industry employment within the affected regions have been analysed, and, in particular, whether these differences can be explained by capacity utilisation, labour productivity, a measure of the strictness of employment legislation, or wider macroeconomic conditions (as set out in Table 7.1).

Table 7.1 Potential drivers of wider employment effects

Potential driver	Definition of driver	Statistical test	Source
Capacity utilisation, by industry	Measure of the extent to which the industry's capital is used in the production of goods The utilisation rate rises and falls with business cycles—as production increases, capacity utilisation rises	To ascertain whether the presence of spare capacity affects wider employment outcomes	Eurostat
Labour productivity	GVA per employee, defined as GVA within regions divided by employment within industries and regions, and averaged across all years and regions within each Member State This also reflects the notion that the skills of the workforce are more likely to be related to their longer-term (average) productivity than to short-term fluctuations in GVA per employee figures	To ascertain whether the degree of capital intensity affects wider employment outcomes	Eurostat
Strictness of employment protection legislation	Indicator of overall strictness of employment protection legislation in each Member State	To ascertain whether the flexibility of labour markets affects wider employment outcomes	OECD
Wider macroeconomic conditions	Growth in national GDP	To ascertain whether general economy-wide conditions affects wider employment outcomes	Eurostat

Note: Eurostat provides data for capacity utilisation rates for the manufacturing industry only. The OECD's measure of the strictness of employment legislation is provided only for the following Member States covered in this study: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovakia, Sweden and the UK.
Source: Oxera.

Statistical analysis has been undertaken to examine whether, and to what extent, the drivers (as set out in Table 7.1) may be able to explain the potential reinforcing employment effects on industry employment.¹³³ Where possible, this analysis considers how the impact of these drivers may vary country by country.

An econometric analysis has been undertaken that seeks to explain the difference between industry employment in the affected regions and redundancies at distressed establishments through each of the potential drivers outlined in Table 7.1.

Given the size of the sample, a statistically robust estimation of a comprehensive model including all potential drivers has not been possible. Therefore, a separate regression model has been estimated to analyse the impact of each of the four drivers. The model captures differences across Member States, as far as possible, given data availability. The impact of each potential driver has been estimated separately for France, Italy, Sweden and the UK; however, given the size of the sample, it has not been possible to infer separate effects for the remaining Member States.

The regression model takes the following form:

$$\text{difference between industry employment in the affected region and redundancies} = \text{constant} + \text{potential driver} + \sum \text{country}_i * \text{potential driver} + \text{error};$$

where country_i represents separate binary variables for France, Italy, Sweden and the UK.

¹³³ This analysis controls for potential systematic country effects, where possible.

The results indicate that the wider employment effects of redundancies at distressed establishments are reinforced in industries with low capacity utilisation and those industries that are characterised by low labour productivity.

The analysis also examined whether wider macroeconomic conditions, the level of redundancies and the strictness of employment legislation influences wider employment effects. However, as no statistically significant results have been found with respect to these potential drivers, the results from this analysis are not shown in Table 7.2. This may be because of the sample size rather than an indication that these factors would not be expected to influence wider employment effects.

Table 7.2 Drivers of the wider employment effects of redundancies—difference between industry employment in the affected regions and redundancies at distressed establishments ('000s)

Reinforcing factor	Capacity utilisation	Labour productivity
France	-0.708*	-0.206*
Italy	-0.793*	-0.222
Sweden	-0.683*	-0.089*
UK	-0.765*	-0.193**
All remaining countries ¹	-0.632	-0.047
Constant	56.635*	6.000
R-squared	0.13	0.10
Number of observations	70	81

Note: *** 1% significance level; ** 5% significance level; * 10% significance level. A robust regression estimator has been used due to the presence of heteroscedasticity. ¹ All EU Member States contained in the sample for the regional and industry analysis, excluding France, Italy, Sweden and the UK.

Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

Capacity utilisation

The results indicate that wider employment effects tend to be reinforced in industries where there is spare capacity. The results suggest that if there is higher spare capacity in the industry, regional employment may fall by more than the redundancies at distressed establishments. For example, a decrease in capacity utilisation by one percentage point has been found to increase the wider employment effects of redundancies at distressed establishment by about 793 workers in the case of Italy and about 708 workers in France. These findings suggest that displaced workers are likely to face greater difficulties finding re-employment if demand conditions in the local region are relatively unfavourable.

Labour productivity

The results suggest that higher labour productivity mitigates the potential wider employment effects following distress-related redundancies. For example, an increase in workers' productivity leading to an increase in GVA per employee by €1,000 (ie, by about 2% on average) may mitigate wider employment effects by 89 employees in Sweden and 206 employees in France. This suggests that the effect of redundancies will be reinforced if distressed establishments are part of industries characterised by relatively low labour productivity. To the extent that low productivity is also related to relatively low skill levels, this might also indicate that the skills of employees in such industries are less readily transferable to alternative employment opportunities.

7.5 Analysis of implications for output

Box 7.3 Key observations from the empirical analysis

Wider industry output effects

- Prior to the onset of distress, industries with distressed establishments tend to perform less well than industries at the national level.
- Following the onset of distress, there appears to be no noticeable underperformance in industries with distressed establishments compared with national trends. This is consistent with findings that firms' revenue quickly rebounds after the onset of difficulties.

Wider regional output effects

- No wider impacts of distress on industry output in regions with distressed establishments could be observed. This suggests that the impact of financial distress on regional and industry output cannot be separately distinguished from wider economic trends.

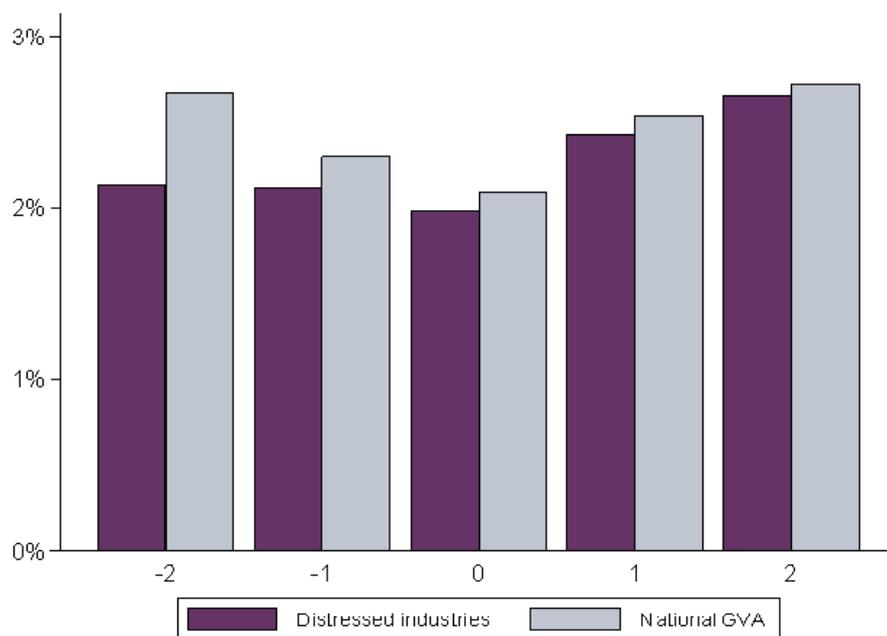
7.5.1 First-stage analysis: wider impacts on regional and industry output

To examine the potential wider economic effects of distress on output, the evolution of industry- and regional-level output has been assessed around the onset of distress at establishments, and compared with wider national trends.

Impact on industry output

Prior to the onset of distress, industries with distressed establishments tend to underperform national trends. However, following the onset of distress, there is no noticeable underperformance. On the one hand, this might imply that industries with distress events are characterised by periods of relative weak performance prior to the onset of distress, or that the decline in these industries might be due to broader trends in the wider economy. On the other hand, the relative improvement in performance of the sector after the onset of distress is consistent with a rebound of firms' revenues after the distress.

Figure 7.7 Evolution of industry output (% year-on-year growth rates)



Note: The figure reports median changes in output.

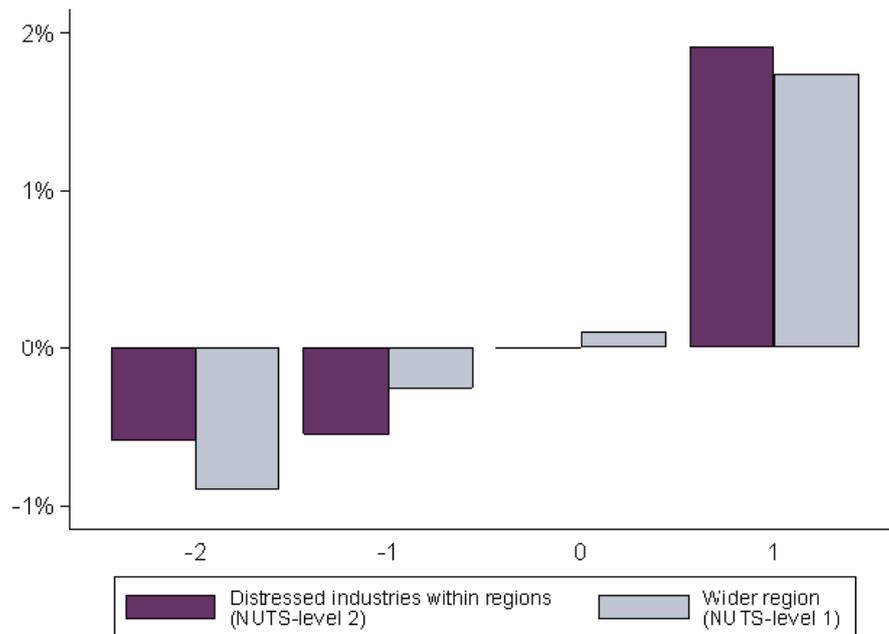
Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

Impact on regional output

To examine the impact of distress on industry output in further detail, the evolution of output in industries in regions with distressed establishments around the onset of distress has been compared with wider regional trends.

Figure 7.8 compares output from industries in regions with distressed establishments with wider trends around the onset of distress at the establishments. The overall pattern is not conclusive. Although there is evidence that growth in regional output in the distressed industries is higher (or less negative) than in the wider region in some periods, this pattern is not consistent.

Figure 7.8 Evolution of regional output (% year-on-year growth rates)



Note: The figure reports median changes in output.

Source: Oxera analysis based on ORBIS, ERM and Eurostat data.

7.5.2 Second-stage analysis: exploring compensating and reinforcing effects

Similar to the analysis for employment discussed above, a second-stage analysis was undertaken to examine whether particular factors, such as capacity utilisation and wider macroeconomic conditions, can explain the difference between output in regions with distressed establishments and performance in the wider regions.

The impact of financial distress on regional and industry output did not provide conclusive results regarding the impact of economic characteristics on the output performance of regions in which distress occurs, compared with other regions. This might be because changes in macroeconomic conditions are likely to affect both industry and regional output, as well as the wider region, but may also be due to the small sample size, which restricts the ability of the analysis to identify effects precisely.

7.6 Insights from the case studies analysis

Box 7.4 Key observations from case studies

- The effects of redundancies at distressed firms appear to be felt more intensely within the distressed establishments' immediate industry and region than in the wider region. This may be a result of displaced workers being able to find alternative employment in other industries.
- Regional outcomes may be magnified if the distressed establishment employs a large proportion of the total workforce in a particular region.
- The effects of firms' difficulties may be magnified due to spillover effects across the supply chain.
- Training programmes for former employees, whether funded and organised by the local government or by the company itself, appear to have positive effects on regional employment, but not necessarily on employment in a given industry. This may be due to re-employment opportunities arising in different industries.
- Local unemployment does not appear to be greatly affected by the firm's difficulties given that it largely follows the same trend as the broader national unemployment following the firm's restructuring. This may predominantly be due to the relocation of employees in other industries within the region, or due to their exit from the workforce, for example through early retirement.
- In most of the cases observed, the existence of local re-employment programmes may have mitigated the overall impact of distress on the regional unemployment levels.

To complement the findings on industry and regional outcomes from the empirical analysis, case studies are also analysed and the results examined using an approach similar to clinical studies. This enables insights to be drawn about the direction of relationships, but does not facilitate either statistical inference or the establishment of causality.

In several cases, declines in firm-level output and employment do not appear to be associated with corresponding falls in either industry or regional employment or output. This is the case when a company's employment decreases as a result of the sale of a division or asset. For example, in the case of Finelist, firm-level employment and output at Finelist fell to zero, but most divisions survived under alternative ownership, with many even returning to growth within a few months.¹³⁴

This illustrates the importance of basing the analysis of industry and regional outcomes on actual redundancies as opposed to the observed reduction in employment for a given firm. By doing so, the analysis focuses on the outcomes for those employees who actually lost their jobs, and the results seek to explain whether those former employees remained unemployed, found employment in the same industry/region or in alternative industry/region, or opted to exit the workforce (eg, through early retirement).

7.6.1 Overall findings

This section presents the overall findings from the analysis of case studies in the following categories: general industry or economic trends; size of employer within region; impact along the supply chain; impact on consumers; and effects of employee training programmes.

General industry or economic trends

In some cases, the medium- to long-term employment and output outcomes in the region seem to be linked to general industry or macroeconomic factors rather than to the firm's difficulties.

¹³⁴ *Birmingham Post & Mail* (2001), 'Management deal saves jobs at Genex UK', and *Midland Business Insider* (2005), 'Out of the wreckage', May 25th

One such example is illustrated by the case of ASP Realisations. In this case, following the initial decrease in employment and output, the Surrey facility, which was sold to Elektron, remained relatively stable for four years before all production was finally transferred to Tunisia in 2008, which may have been a response to increasing competition from lower-cost countries. In another case, Métaltemple's declining sales and employment occurred during a period when the company's industry was contracting, as indicated by a decline in total employment in the industry nationwide.¹³⁵ This suggests that in such cases the causal chain may start from events that are outside the companies' control (eg, economy- or industry-wide) which then lead to contraction of output and employment at the firm level, rather than the other way around.

General industry trends can be measured by observing the evolution of employment within an industry compared with total employment in that region. A decrease in the industry's share of employment over time may indicate a systemic problem within the industry (rather than an idiosyncratic, firm-specific, problem). For both Danish Steel Works and Junckers, the share of their respective industry's regional employment as a proportion of total employment appeared to fall by more than half over the periods considered, indicating that their industries were contracting during that period.¹³⁶

Size of employer within region

Regional outcomes may be amplified if the employer's establishment represents a significant proportion of total employment in that region.

While significant redundancies at a large employer do not always lead to greater unemployment problems in the respective region (eg, in cases where former employees find alternative employment or leave the workforce), the redundancies may have negative consequences for the region through their effects on reduced tax revenue for the local government. For example, in the case of Danish Steel Works, the falling unemployment rate in the region, combined with declining employment in the local iron and metal industry, indicates that former employees who were not re-employed by the successor company, Dansteel, may have either found alternative employment in other industries or exited the workforce through, for instance, early retirement (the number of which rose sharply in 2003, the year of restructuring).¹³⁷

Findings from the Moulinex case suggest that the absolute size of redundancies also appears to matter, regardless of whether the employer represents a large proportion of the local workforce. For example, a study by Macaire (2004) found that redeployment rates were lower in the region with the largest numbers of redundancies: the Calvados region, with nearly 2,000 redundancies, had a re-deployment rate of 78% compared with over 90% for both Manche and Orne, which had redundancies of approximately 150 and 750, respectively.¹³⁸

In the case of Junckers, which employed 86% of the Køge workforce in the wood and paper industry, the firm's difficulties also appeared to have indirect ramifications on the region through its impact on consumers.¹³⁹ The challenges that appear to have been experienced by Junckers may have contributed towards difficulties obtaining long-term contracts, and there is also some indication that other customers may have switched to alternative suppliers.¹⁴⁰ From the available public information, it is unclear whether consumers switched to small Danish firms or to manufacturers of wooden floors in neighbouring countries. These two outcomes would have had significantly different effects on the Danish industry for

¹³⁵ *Les Echos* (2007), 'Un secteur frappé de plein fouet par la mondialisation', August 27th.

¹³⁶ Statistics Denmark.

¹³⁷ Statistics Denmark, www.statistikbanken, table RASA.

¹³⁸ Macaire (2004).

¹³⁹ Statistics Denmark, online statistics, www.statistikbanken.dk.

¹⁴⁰ Junckers (2003), 'Annual Report' and Junckers (2004), 'Annual Report'.

wooden floors: the former may have benefited small local firms, while the latter may have led to increased imports from neighbouring countries without promoting the local industry.

Impact along the supply chain

A firm's difficulty may also have impacts on its industry through spillover effects along the supply chain. For instance, as Moulinex was one of Euromoteur's main customers, the reductions in the company's orders, which led to declining sales for Euromoteur, eventually may have contributed towards Euromoteur reducing employment by over 50% in 2004.¹⁴¹

Effects of employee training programmes

Training programmes for former employees, whether they are funded and organised by the local government or the company itself, tend to have positive effects for regional employment, but not necessarily for industry employment as several re-employment opportunities arise in different industries.

In the case of Danish Steel Works, for example, the training programmes largely helped former employees to find employment in alternative industries (eg, transport, machinery, fishing, social work) rather than in the steel industry.¹⁴² This may have been due to the limited supply of work opportunities in the steel industry, partly as a result of the industry's difficulties in that period, but also because there were no other steel companies in Denmark at the time of the company's restructuring. This is supported by the fact that the proportion of local employment in Frederiksværk's steel industry almost halved from 21% in 1999 to 11% in 2006.¹⁴³ Despite these job relocations to other industries, total employment in the region of Frederiksværk still fell by approximately 10% in 2003 and only partly recovered by 2006 as people found alternative employments.¹⁴⁴ The initial fall in 2003 coincides with a 9% rise in early retirements compared with the previous year.¹⁴⁵

7.6.2

Detailed analysis of regional- and industry-level employment outcomes

To study the impact of a firm's distress on regional or industry employment, it is helpful to observe cases where the firm's establishment in a region employed a considerable proportion of local employment before the onset of distress. Four case studies were selected based on the availability of data (see Table 7.3), spanning five regions in two countries (Denmark and France), and a total of six restructuring events.

¹⁴¹ European Commission (2006).

¹⁴² EMCC Case Studies (2006), 'Managing Large-scale Restructuring: Danish Steel Works'.

¹⁴³ Statistics Denmark, www.statistikbanken, table RASA.

¹⁴⁴ Statistics Denmark, www.statistikbanken, table RASA.

¹⁴⁵ Statistics Denmark, www.statistikbanken, table RASA.

Table 7.3 Selected case studies for detailed analysis of regional- and industry-level outcomes

	LEGO	Danish Steel Works	Junckers	Moulinex
Region	Billund, Denmark	Frederiksvaerk, Denmark	Køge, Denmark	Calvados and Alençon, France
Industry	Toys	Steel	Wooden floors	Small household appliances
Year(s) of job losses	1999–2000 and 2003–04	2002	2003–04	2001
Establishment employment				
as % of local industry employment	112% (1999); 109% (2003)	86%	86%	7% (Calvados); 11% (Alençon)
as % of local employment	47% (1999); 39% (2003)	15%	5%	1% (Calvados); 2% (Alençon)%
Unemployment rate				
local	3.3% (1999); 3.2% (2003)	4.7%	4.3%	8.4% (Calvados); 6.6% (Orme, including Alençon)
national	6.6% (1999); 5.2% (2003)	5.2%	5.2%	8.1%

Note: Employment and unemployment data are listed as of the year prior to the start of the job losses. An establishment's share of local industry employment greater than 100% indicates that the firm may employ workers from neighbouring regions.

Sources: Company accounts, Statistics Denmark (Danmarks Statistik), National Institute of Statistics and Economic Studies in France (INSEE), Oxera analysis.

As shown in the table, in the three Danish cases, the establishment's workforce represented over 85% of the local industry employment. LEGO employed a large proportion (in excess of 50%) of the local town—Billund—workforce in the toy industry.¹⁴⁶ The two Moulinex plants employed 7% and 11% of local employment in the local industry—the narrowest industry breakdown available from the available regional French employment data.¹⁴⁷ Despite the smaller share of local industry employment of the two Moulinex plants compared with the other case studies reported in Table 7.3, it is informative to analyse the effects of the closure of the plants on the regional/industry employment, as this may help to isolate the effects of an establishment's share of local employment on regional and industry outcomes.

For each of the six cases (the two LEGO cases, the two Moulinex cases and the cases for Danish Steel Works and Junckers), Figures 7.8 to 7.12 below illustrate:

- the change in local company employment (ie, for the plant where the redundancies occurred);
- the change in regional-industry employment;
- the change in the regional employment (ie, for all industries in the given region);
- the unemployment level in the firm's region; and
- the unemployment level in the firm's country.

Some of the key observations from this analysis are outlined below.

¹⁴⁶ Company accounts.

¹⁴⁷ National Institute of Statistics and Economic Studies in France (INSEE), unemployment data downloaded for 1999–2008, available at <http://www.statistiques-locales.insee.fr/esl/baseTelechSelect.asp?IdSousTheme=9&Origine=theme>.

- **Sensitivity of local regional employment.** In all but one case, local regional employment fell in each of the two years following the restructuring event. Local regional employment tends to be more sensitive to the redundancies than corresponding employment for all industries within a region, indicating that the negative effects within the establishment's industry may be partly offset by positive outcomes in other industries within the same region. This may be as a result of workers' ability to find alternative employment in the same region. In most cases observed, local regional employment tends not to recover and continues to decline for as long as three years after the restructuring event. Local employment may be sensitive to redundancies at a distressed establishment in cases where the establishment employs a very large proportion of the local workforce, which may force displaced workers to exit the local workforce, perhaps to seek employment in neighbouring regions (eg, see LEGO case).
- **'Insensitivity' of local unemployment.** Although local unemployment generally rises in the year following restructuring, its trend in most cases appears not to be dissimilar to the trend in corresponding national unemployment, suggesting that the rise in local unemployment may be linked to broader national economic conditions. Also, in all but one case, the local unemployment rate *prior* to the firm's restructuring was lower than the average national unemployment rate, indicating that the redundancies occurred in relatively economically healthy regions. This finding is observed even though most of the firms in these six case studies represented more than 10% of the industry's local employment.

Evidence from each case is presented below in more detail.

LEGO (Billund, Denmark, 1999–2000 and 2003–04)

Following both of LEGO's restructurings, local employment in Billund's 'furniture and other' industry (in which LEGO is classified) tended to be more volatile than total employment in the town of Billund (see Figure 7.9). Nevertheless, compared with the other cases analysed, regional employment in Billund seemed to be more affected by LEGO's difficulties. This may be due partly to the small size of Billund's workforce: LEGO employment represented close to 50% of Billund's employment, while in other cases the establishment's share of regional employment was at most 15% (see Table 7.3 above).¹⁴⁸

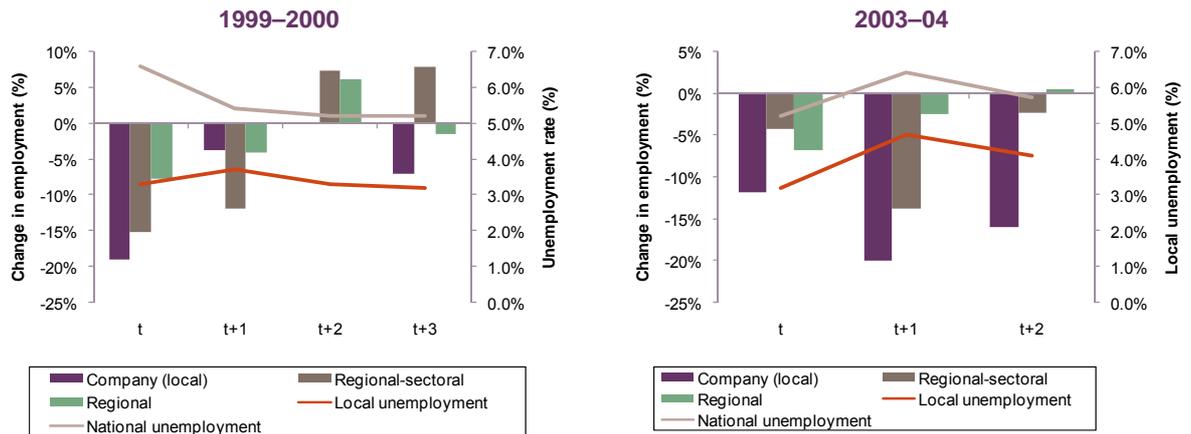
During the period from 1999 to 2004, employment in Billund's 'furniture and other' industry decreased by a total of 1,344 workers (35%), broadly in line with the total decrease in total employment in Billund of 1,423 workers (14%).¹⁴⁹ The unemployment rate in Billund during the same period decreased, from 3.3% in 1998 to 2.6% in 2006. This suggests that most of the displaced workers exited Billund's workforce either by finding alternative employment in neighbouring regions or by opting for early retirement. Over the period, Billund's unemployment broadly followed the trend in national unemployment rate, remaining approximately 2% lower each year.¹⁵⁰

¹⁴⁸ Company accounts, Statistics Denmark (Danmarks Statistik), National Institute of Statistics and Economic Studies in France (INSEE), Oxera analysis.

¹⁴⁹ Statistics Denmark (Danmarks Statistik).

¹⁵⁰ Statistics Denmark (Danmarks Statistik).

Figure 7.9 Regional and industry effects of LEGO's restructuring 1999–2000



Note: Regional employment and unemployment data both refer to the Billund region, while industry employment data refers to the 'furniture and other' industry. Changes at time t denote the total employment change during LEGO's restructuring, which took effect during 1999 and 2000, and 2003 and 2004, respectively. Thereafter, each increment refers to changes in the following year.

Source: Company annual reports, Statistics Denmark (Danmarks Statistik), Oxera analysis.

Danish Steel Works (Frederiksværk, Denmark, 2002)

Following the onset of difficulties, Danish Steel Works reduced its workforce by almost 900 people (an 80% reduction) to 222 at the end of 2002, before taking on 111 additional workers during the next year (an increase of approximately 50%) as it expanded production (see Figure 7.10).¹⁵¹ The effects of the exit of Frederiksværk from the iron and metal industry were felt with a one-year lag, which may be partly driven by a lag in employment reporting data.

The positive impact on the industry's local employment in 2005 (ie, denoted t+3 in Figure 7.10) may have been driven by the reopening of the two former Danish Steel Works (renamed Dansteel) plants, Elektrovaerk and Kontivaerk, by their new owners in 2004–2005. This coincided with a decline in the region's unemployment, from a high of 6.9% in the previous year to 6.3%.¹⁵² By 2006, the unemployment rate in Frederiksværk was close to 4%. This decline in unemployment may have been partly due to people leaving the workforce, perhaps by way of early retirement; according to Statistics Denmark, the numbers of employees taking early retirement increased during the same period. Between 1998 and 2006, the Frederiksværk's workforce declined by 500 people, or 5%.¹⁵³

However, the two plants, unlike Dansteel, did not prove to be steady employers for the region as they closed down temporarily in 2005–2006, before reopening again. The new owner of the Elektrovaerk plant, Vorskla Steel, declared bankruptcy and closed the plant again in 2009.¹⁵⁴

¹⁵¹ Company annual reports and Statistics Denmark (Danmarks Statistik).

¹⁵² Statistics Denmark (Danmarks Statistik).

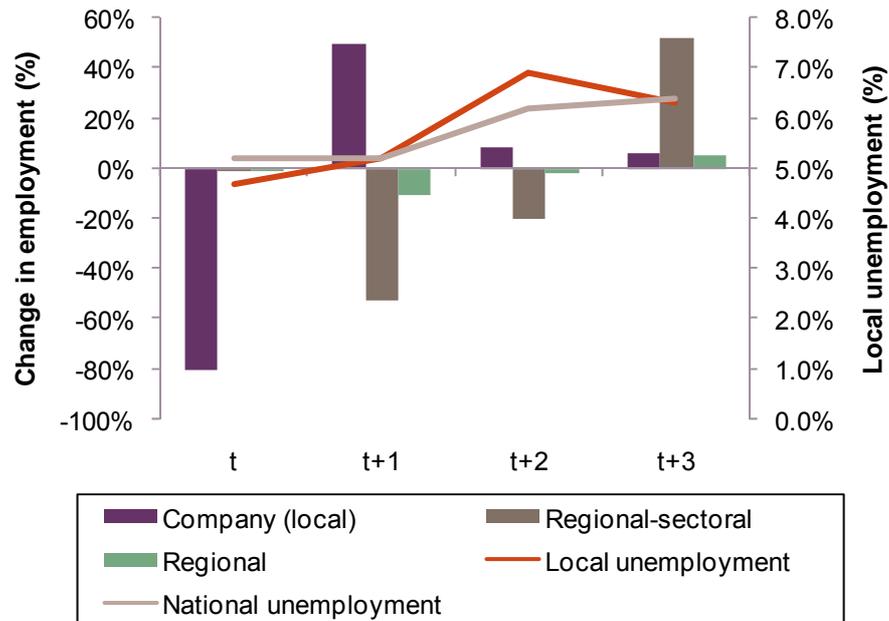
¹⁵³ Statistics Denmark (Danmarks Statistik).

¹⁵⁴

http://www.eurofound.europa.eu/emcc/erm/static/factsheet_14284.htm?details=1&template=searchfactsheets&order=date&isearch=&page=&sel=7&totalRecords=9798&date=

See <http://www.eurofound.europa.eu/emcc/publications/2005/ef0548enC6.pdf>.

Figure 7.10 Regional and industry effects of Danish Steel Works' restructuring, 2002



Note: Regional employment and unemployment data both refer to the Frederiksværk region, while industry employment data refers to the 'iron and metal' industry. Change at time t denotes the total employment change during 2002, and thereafter each increment refers to changes in the following year.

Source: Company annual reports, Statistics Denmark (Danmarks Statistik), Oxera analysis.

Junckers (Køge, Denmark, 2003–04)

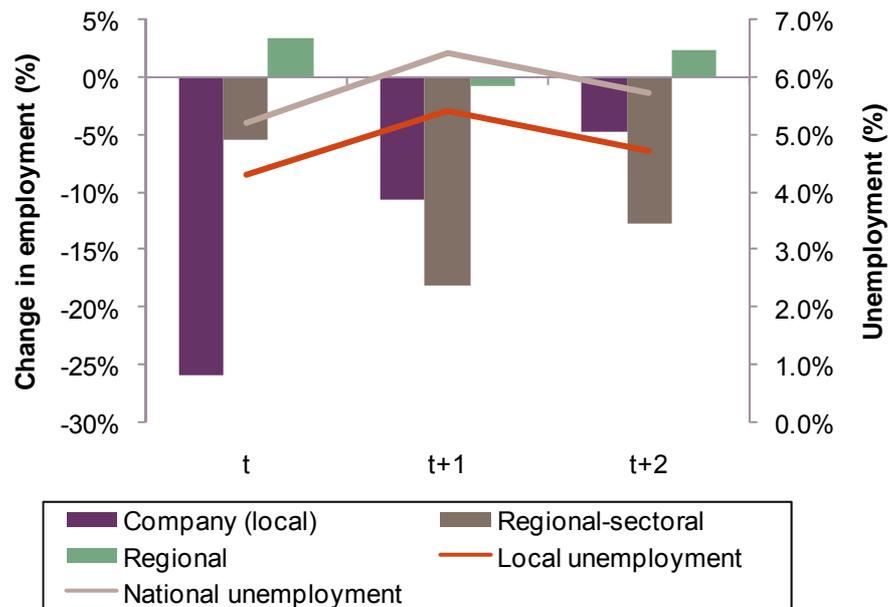
Before its difficulties, Junckers employed over 5% of the total workforce in Køge, and 86% of the Køge workforce in the wood and paper industry.¹⁵⁵

Employment in the wood and paper industry in Køge decreased by 400 people from 2002 to 2006, but total employment in Køge increased by almost 1,000 people during that same period (see Figure 7.11, where time 't' denotes the total change during 2003 and 2004).¹⁵⁶ The wood and paper industry's share of total employment in Køge decreased from 10% in 1997 to 4% in 2006, which suggests that people found employment in alternative industries (see Figure 7.11). Furthermore, the local unemployment in Køge increased only temporarily before declining again, in line with the national unemployment trend.

¹⁵⁵ Company annual reports, Statistics Denmark (Danmarks Statistik).

¹⁵⁶ Company annual reports, Statistics Denmark (Danmarks Statistik).

Figure 7.11 Regional and industry effects of Junkers' restructuring, 2003–04



Note: Regional employment and unemployment data both refer to the Køge region, while industry employment data refers to the 'wood and paper' industry. Changes at time t denote the total employment change during Junkers' restructuring, which took effect during 2003 and 2004. Thereafter, each increment refers to changes in the following year.

Source: Company annual reports, Statistics Denmark (Danmarks Statistik), Oxera analysis.

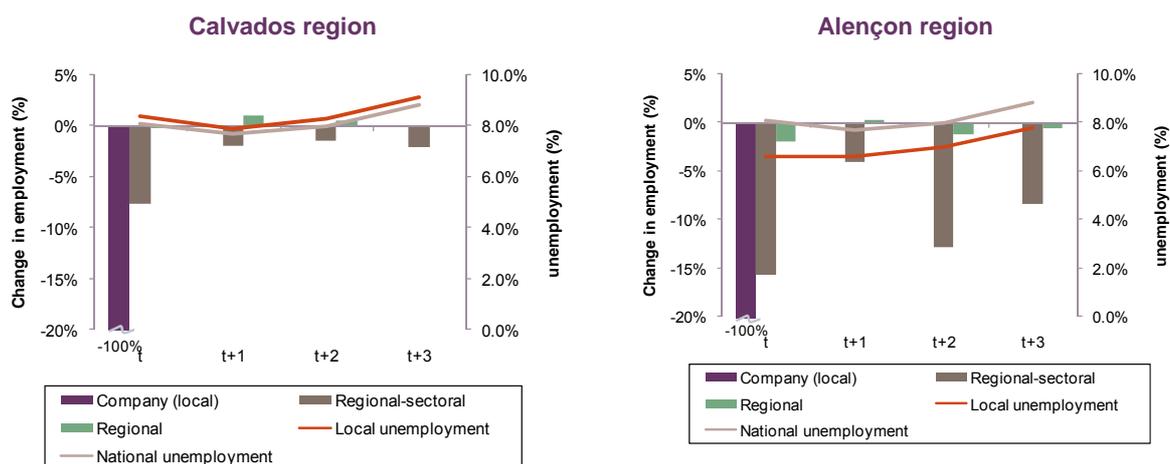
Moulinex (Calvados and Alençon, France, 2001)

Following Moulinex's difficulties, both the Calvados and Alençon plants were completely closed, resulting in a total employment loss of around 2,700 jobs.¹⁵⁷ Figure 7.12 illustrates that the job losses had larger impacts at the local industry level than at the regional level as a whole. By 2004, close to half of former Moulinex workers in those regions had found alternative employment, and the total redeployment rate (including former workers who found social solutions such as early retirement) was 78% in Calvados and 94% in Orne.¹⁵⁸ Unemployment in both regions rose over the three-year period following the restructuring, but the trend was broadly in line with the unemployment rate of France as a whole.

¹⁵⁷ Company annual reports.

¹⁵⁸ Macaire (2004).

Figure 7.12 Regional and industry effects of Moulinex restructuring, 2001



Note: Regional employment data refers to the Caen–Bayeux (Calvados) and Alençon–Argentan regions, regional unemployment data refers to the Calvados and Orne regions, and industry employment data refers to the ‘industry’ industry. Change at time t denotes the total employment change during 2001, and thereafter each increment refers to changes in the following year.

Source: Company annual reports, National Institute of Statistics and Economic Studies in France (INSEE), Oxera analysis.

7.7 Summary of key findings on the implications

This section has investigated whether financial distress experienced by establishments might be associated with wider effects on employment and output at the regional and industry level.

Empirical analysis

The empirical analysis has found that redundancies at distressed establishments are typically associated with declines in employment within the regions and industries in which the establishments are located. Following redundancies at distressed establishments, the reduction in employment in the same industries and regions appears to be greater than redundancies at the distressed establishments. This suggests that displaced workers experience difficulties finding alternative work in the same industry in the affected region.

The results from the empirical analysis also suggest that these wider effects may be reinforced in regions where there is spare capacity. This suggests that displaced workers may face greater difficulties finding re-employment if demand conditions are relatively unfavourable.

The empirical analysis as well as results from existing empirical studies indicate that the impact of redundancies are reinforced if distressed establishments are part of industries characterised by low labour productivity, which may be indicative of relatively low capital intensity. To the extent that low productivity is also related to relatively low skill levels, this might also indicate that the skills of employees in such industries are less readily transferable to alternative employment opportunities.

Prior to the onset of distress, industries with distressed establishments tend to perform less well than industries at the national level. However, following the onset of distress, there appears to be no noticeable underperformance in industries with distressed establishments compared with national trends. This is consistent with findings from the firm-level empirical analysis which suggest that revenues quickly rebound after the onset of difficulties.

The analysis has not found any wider effects of distress on output, suggesting that the impact of financial distress on regional and industry output cannot be separately distinguished from wider economic trends.

Case studies

The effects of redundancies at distressed firms appear to be felt more intensely within the distressed establishments' immediate industry and region than in the wider region. This may be a result of displaced workers being able to find alternative employment in other industries.

There is some indication that regional outcomes may be magnified if the distressed establishment employs a large proportion of the total workforce in a particular region. The effects of firms' difficulties may also be magnified due to spillover effects across the supply chain.

Local unemployment does not appear to be greatly affected by the consequences of distress at an establishment. This may be due to employees finding work in other industries within the region, or due to their exit from the workforce, for example through early retirement.

8 Conclusions: Summary of findings and implications for decision making in approving restructuring aid

8.1 How to implement Oxera findings in practice?

The Commission has asked for evidence to help identify in which markets/cases and circumstances firms in difficulty (without recourse to restructuring aid) either survive or do not survive, as well as those instances when the negative impacts of firms' distress on output and employment tend to be limited and when they tend to be extensive.

Previous sections have provided detailed evidence on these points, through empirical and statistical analysis, case studies and reviews of past empirical research. This section shows how that evidence can be brought together and used by the Commission in case practice.

The section is intended to inform the following framework:

- the information set that the Commission might require on a case to inform the counterfactual for jobs and activities;
- economic relationships that might be expected between what the Commission can observe ex ante and the expected outcome for jobs and activity in the counterfactual of no aid;
- applying these relationships to the information set of the case could create a presumption about the counterfactual, which might still be overturned by idiosyncratic features of the case. The same process may also assist the Commission in screening cases to prioritise those where the spillover effects of distress on output and employment tend to be greater;
- where, using this framework, the facts of the case suggest that the impact on jobs and activity in the counterfactual would be limited, the Commission might wish to require the Member State to provide further evidence to demonstrate why there would be a significant effect.

This section is structured as follows. Sections 8.2 and 8.3 discuss how Oxera's findings can be used to inform a counterfactual to restructuring aid. Sections 8.4 to 8.6 then illustrate how to map the findings onto counterfactuals for firm survival, output and employment, and spillover effects. The section ends with a summary of the overall implications for case practice in restructuring aid.

8.2 Constructing the counterfactual scenario

8.2.1 The purpose of the counterfactual

As noted by DG Competition's Economic Advisory Group on Competition Policy (EAGCP) in its 2008 commentary on the Rescue and Restructuring Aid guidelines, a counterfactual to restructuring aid should ideally address two main issues:

- what would happen to the firm's assets if no aid were granted?
- what would the social implications be for the locality of any sudden loss of jobs?

With regard to assets, the **EAGCP** recommends:

in cases where restructuring aid is meaningful (i.e. at least some part of the firm can profitably operate in the medium term) it is often the case that some of the bankrupt firm's assets will be purchased and used by another firm. For example, a factory may continue in operation under new ownership, or the new owner may buy only the brand name and transfer production elsewhere. Evidence should include failed attempts to sell the assets to other firms with a capacity to operate them efficiently.¹⁵⁹

With regard to employment, the EAGCP recommends:

in as much as employment is expected to fall in a local area, it is necessary to identify re-employment and mobility prospects. All economic progress requires change, so the counterfactual should identify why this situation would be particularly inequitable. Evidence should include local unemployment rates, lack of success in local job creation and relative weakness of employment and regional policies.¹⁶⁰

The Oxera study provides support to the EAGCP's recommendations, and goes beyond them, in that it identifies a wider range of information relevant to isolate the most probable counterfactual to restructuring aid. However, this study provides empirical findings only where the data permits and therefore cannot account for every eventuality relevant to determining the counterfactual.

Given this background, it is useful to highlight a few points on how the evidence in this report might be used effectively, as well as limitations of the analysis.

- The relationships that are identified in this study provide a more refined economic approach to informing the counterfactual, including the effects of distress on employment.
- The empirical evidence provides insights about what happens to firms in distress without any state intervention, but it does not show whether restructuring aid would have a net positive economic effect.
- If applied in a similar way to the 'failing-firm defence' in merger control, the implementation of this study's results would affect the evidential burden for the approval of restructuring aid cases.
- Outcomes post-distress are partly influenced by historical developments and partly by future market conditions. In each case the Commission would know the former but not the latter. Therefore, to the extent that market conditions are important, it is suggested that the Commission would use forecasts.
- The implications of the study may go beyond the Rescue and Restructuring Aid guidelines, since improvements to bankruptcy codes and reduced frictions in the labour market could, at least to some extent, mitigate the employment and output consequences of financial distress.

8.2.2 The difficulties of constructing the counterfactual

Since each case is different, the particular challenge of this project is to provide insight into not only what information about counterfactual scenarios can be deduced from past cases, but also to what extent and how that information can be usefully mapped onto the specific information that might be available to the Commission in future cases. When applying the findings from this project to a particular case, it is important to ensure that sufficient weight is given to case-specific information.

¹⁵⁹ EAGCP (2008), p. 9.

¹⁶⁰ Ibid.

By way of comparison, the counterfactual also needs to be inferred as part of merger control, in the context of the failing-firm defence.¹⁶¹ In mergers the burden is typically on the notifying parties to submit all the evidence to demonstrate that the failing firm defence would hold. A test that can be considered to be similar to the failing-firm defence may need to be undertaken as part of a restructuring aid case, since, to be eligible for aid, the firm must qualify as a ‘firm in difficulty’, and for that the firm’s difficulties must be so severe that they:

almost certainly condemn it to going out of business in the short or medium term.¹⁶²

In addition, the firm is only eligible if it has no access to alternatives to state aid:

a firm in difficulty is eligible only where, demonstrably, it cannot recover through its own resources or with the funds it obtains from its owners/shareholders or from market sources.¹⁶³

Finally, the benefits flowing from survival should be greater than the distortion to competition:

any distortions of competition will be offset by the benefits flowing from the firm’s survival (for instance, where it is clear that the net effect of redundancies resulting from the firm’s going out of business, combined with the effects on its suppliers, would exacerbate employment problems ...).¹⁶⁴

Given the wide range of effects that might need to be considered, the construction of the counterfactual for restructuring aid is accordingly expected to be complex and specific to the facts of the case. Therefore, the Commission may wish to establish that the burden of proof lies with Member States, which may be best placed to gather the relevant information.

The Oxera study might help to provide a baseline checklist of information to be supplied, together with guidance as to how to interpret that information. This checklist might be helpfully supplemented by the Commission’s experience in defining the counterfactual for survival, employment and activity.

Before providing the checklist, three more general questions are answered. In the Oxera sample:

- do distressed firms generally fail to survive?
- do output and employment generally fall to zero?
- are the spillover effects of distress generally positive or negative?

8.2.3 Do distressed firms generally fail to survive?

In the Oxera main counterfactual sample used for the purposes of the empirical analysis:

- 23% of firms were not acquired and ceased reporting within three years after the onset of distress. These firms could be labelled ‘non-survivors’;
- 77% of firms were either acquired (20%) or continued reporting (57%) three years after the onset of distress. These firms could be labelled ‘survivors’.

The proportion of survivors in the sample going into distress in 2005 is lower than for other years due to data limitations. This means that the true proportion of survivors is likely to be higher (approximately 84%—the average proportion of survivors in years unaffected by data issues).¹⁶⁵

¹⁶¹ European Commission (2004a), para. 90.

¹⁶² European Commission (2004b), para. 9.

¹⁶³ *Ibid.*, para. 11.

¹⁶⁴ *Ibid.*, para. 31.

¹⁶⁵ This is estimated as the average survival rate for all years, excluding those firms that go into distress in 2005.

The proportion of non-survivors varies across Member States in the sample, with a rate of only 10.7% in Belgium, but a rate of 40.0% in Romania. Non-survival rates also vary by sector, from 3.4% in healthcare to 31.9% in manufacturing.

This compares with the findings of London Economics (2004) for the Commission that, of the 71 cases where restructuring and rescue aid was granted (1995–2002), one-third continued with the same legal status when granted the aid; one-third ceased operations; and one-third changed their name or were bought by other companies.¹⁶⁶ A simple comparison between these results suggests that the aid beneficiaries, in comparison to Oxera's counterfactual sample, were less likely to continue trading, more likely to be acquired, and less likely to survive with unchanged status.

8.2.4 Do output and employment generally fall to zero?

Based on the sample used in the empirical analysis, employment falls on average by around 30% of its pre-distress level and revenues fall by almost 20% over three years post-distress, with the trend continuing over the fourth and fifth years after the onset of distress. This assumes that, for non-survivors, both output and employment fall to zero (at least at the firm level). To the extent that some firms that do not survive in the current legal form continue operations under a different legal entity, the average effects of distress in the counterfactual might be slightly milder than a 30% reduction in employment and a 20% reduction in output for the three years following distress.

8.2.5 Are the spillover effects of distress generally positive or negative?

Regarding regional employment within a sector, the empirical analysis indicates that, following redundancies at distressed establishments, the total reduction in employment in the same industries and regions is typically greater than the number of redundancies at the distressed establishments.

At the industry level, therefore, redundancies at distressed establishments are generally associated with declining employment within the industry in which the distressed establishments are located. Employment in industries containing distressed establishments grows more slowly than national trends, both before and one year after the announcement of job losses at the distressed establishment.

This suggests that distress at the firm level is associated with underperformance at the industry and regional level, which means either that a firm's distress has some spillover effects on the industry and region or that it is negatively affected by industry-wide trends. Either way, the key observation is that there appear to be strong and consistent links between the impact of distress at the firm level and economic performance in a given industry and region. Therefore, from a policy perspective, these effects would need to be jointly considered.

Two years after the redundancies, growth in employment in distressed industries tends to be similar to national trends. This is consistent with findings that firms' revenues quickly rebound after the onset of distress.

For output, the empirical analysis finds no wider impacts of distress at an establishment on industry output in regions that contain distressed establishments. This suggests that the impact of financial distress on regional and industry output cannot be separately distinguished from wider economic trends.

In practice, redundancies at distressed establishments might be expected to lead to wider negative impacts on output. A number of empirical studies have examined the drivers of wider effects on output, and have found that these largely depend on firms' characteristics as well as industry structure. For example, larger bankruptcies have been found to lead to greater contagion across firms and suppliers, the transmission of financial distress between

¹⁶⁶ London Economics (2004), p. viii.

firms has been found to increase with the level of product specialisation, and the effect on the region or industry has been found to be greater if suppliers have fewer opportunities to switch customers.

As for output at an industry level, *prior to* the onset of distress, the empirical analysis indicates that industries with distressed establishments tend to perform less well than industries at the national level. Following the onset of distress, there is no noticeable underperformance in industries with distressed establishments compared with national trends. This is also consistent with findings from the empirical analysis that firms' revenue quickly rebounds after the onset of difficulties.

In summary, the spillover effects of distress in the sample are generally (mildly) negative for employment, but no spillover effect is detected for output according to the empirical analysis.

8.3 The information set for a counterfactual

When considering factors that might determine the outcome of distress in a particular case, there are three types of information that the Commission could consider:

- historical and current information about the firm, sector and the economy, which, based on past cases, is expected to influence the outcome of distress and affect its magnitude (eg, severity of financial difficulty or capital structure). The Commission might enhance this information set by requesting additional details about the firm or market in which it operates.
- information or forecasts about the future that are likely to influence the outcome of distress (eg, performance of the economy or sector over the next two to three years). The Commission might enhance this information set by using economic forecasts and assessing the current situation in the economy and in the sector;
- specific information on idiosyncratic factors present in a particular case that suggest a different impact of distress than would have been normally expected based on the first and second information sets above.

On the one hand, each case is likely to feature special circumstances (corresponding to the third information set listed above), which could be seen as either reinforcing or counterbalancing the implications of factors derived from the first and the second information set. On the other hand, there is some risk of seeing each case as 'special', where only the information from the third set is considered (ie, special circumstances). This would not be appropriate unless it can be clearly demonstrated that the circumstances in a specific case are expected to nullify or mitigate the effects that would normally be expected to occur in a particular case (based on the first and second information sets above).

Table 8.1 below lists the key factors which this study finds relevant to informing the counterfactual to restructuring aid.

Table 8.1 Information set for the counterfactual

A. Firm, sector and country characteristics	Data required/how measured by Oxera
Industry	Sector of firm in distress/manufacturing or non-manufacturing firm
Firm size	Size of assets
Concentration in industry	Based on level of competition in firm's sector
Concentration in region	Share of total regional employment or output, as available
Capacity utilisation	Data on capacity utilisation in manufacturing industry available from Eurostat
Assets can be re-deployed to alternative uses	Degree to which assets can be recycled to alternative uses (eg, most real estate assets would score a high ranking, while specialised machinery would score a low ranking)
Non-specialised product base	Degree to which competitors could integrate the company's product within their product portfolio
Ease with which individual business units can be sold	Assessment of whether divisions could operate as stand-alone entities based on company information
Insolvency code	Origin of insolvency code
B. Firm performance (asset side)	Data required/how measured by Oxera
Performance as at distress	As measured by, for example, EBIT to assets, EBIT to liabilities and net income to capital
Change in financial performance	As measured by, for example, change in profitability (EBIT to sales) immediately prior to distress
Performance prior to distress	As measured by, for example, level of profitability (EBIT to sales) immediately prior to distress
Growth prior to distress	As measured by, for example, growth in turnover immediately prior to distress
C. Financial structure (liabilities side)	Data required/how measured by Oxera
Gearing	As measured by debt to assets
Access to capital	Company has access to capital to fund its operations and investment, either from private sources or through capital markets
Proportion of bank debt and number of creditors	As observed based on sources of financing for company
D. Market conditions (post-distress)	Data required/how measured by Oxera
Growth of GDP post-distress	Forecasts of GDP growth/actual GDP growth
Favourable demand conditions post-distress (GVA)	Forecasts of sector demand growth/actual sector GVA growth
E. Workforce and labour market characteristics	Data required/how measured by Oxera
Proportion of permanent (as opposed to temporary) workers	As observed
Flexibility of labour market legislation	Based on legislation adopted in the jurisdiction of the company
Greater proportion of older workers	As observed
Greater proportion of educated workers	As observed
Substitutability of human capital	Difficulty with which skills of establishment's employees can be replicated in other locations
Productivity of workers (GVA)	GVA per employee in firm's sector and country
Level of local unemployment	Unemployment rate in firm's immediate region
Training programme for displaced workers	Existence of training programme (whether funded by either state, local government, company, or other)

Source: Oxera analysis.

The implication is that, where possible, the Commission seeks this baseline information in order to inform the counterfactual to restructuring aid. Given the potentially large social benefits of more targeted aid, the cost of gathering a full information set might be considered relatively small.

8.4 Illustration of mapping Oxera findings onto the counterfactual for firm survival

The purpose of sections 8.4 to 8.6 is to show how the findings can be used in practice to form expectations on the counterfactuals for survival, output and employment, and spillover effects. While the detailed results in sections 5, 6 and 7 could be used in combination with data on a case to construct a more refined counterfactual than the illustrations presented below, the results are simplified here to provide a practical demonstration of how the findings can be mapped to counterfactuals.

Table 8.2 and subsequent tables present a ‘cross-check’ of the information set on a case against the relevant economic relationships. For example, if data on profitability is available then part B of Table 8.2 can be used to look up how the profitability metrics can be interpreted for the likelihood of firm survival. The list of factors presented in the tables for illustration is not complete and can be supplemented with more detailed analysis, including all the factors discussed earlier in the report.

Table 8.2 illustrates how the findings from statistical analysis, case studies and literature can be mapped onto counterfactuals for firm survival. In all cases characteristics such as financial performance can be usefully benchmarked against industry averages.

Table 8.2 Illustration of factors relevant to determine a ‘positive’ or ‘negative’ counterfactual scenario based on determinants of firm survivability

	‘Positive counterfactual’— firm is more likely to survive	‘Negative counterfactual’— firm is more likely to fail	Sources of evidence
A. Firm, sector and country characteristics			
Industry	Non-manufacturing	Manufacturing	E ¹ , L
Firm size	Large firm	Small firm	E ² , L
Assets can be re-deployed to alternative uses	High asset substitutability	Low asset substitutability	L
Ease with which individual business units can be sold	Firm has some relatively stand-alone divisions to divest	Firm is highly integrated—divestiture of business units difficult	C
Insolvency code	For example, UK or Nordic insolvency code	For example, French or German insolvency code	L
B. Firm performance (asset side)			
Performance as at distress	Lower losses at point of distress	High losses at point of distress	E, L
Change in performance prior to distress	Smaller deterioration in earnings prior to distress	Greater deterioration in earnings prior to distress	E
Growth in firm’s output prior to distress	Rapid growth in output prior to distress	Slow growth in output prior to distress	E ³
C. Financial structure (liabilities side)			
Gearing	Low gearing	High gearing	E, L
Access to capital	Good access to capital, including private capital	Poor access to capital, including private capital	C
Proportion of bank debt and number of creditors*	Liabilities predominantly comprise bank debt and/or debt from fewer lenders	Liabilities have lower proportion of bank debt and/or debt from many lenders	C
D. Market conditions (post-distress)			
Growth of GDP post-distress	Fast growth in GDP	Slow growth in GDP	E (for selected Member States) ⁴
E. Workforce, labour market characteristics			
Flexibility of labour market legislation	Flexible labour market	Inflexible labour market	L, C

Notes: E, empirical analysis (econometrics); L, literature, C, case studies. ¹ The empirical analysis presented in section 5.4 indicated that survival rates were lower for manufacturing firms, however, this relationship was not found to be statistically significant in most models. ² In some instances, the definition of size adopted in the literature may differ from the Commission’s criteria. On this aspect, less weight should be placed on this finding compared with the results from the empirical analysis. ³ The longer-term impact could not be tested in the econometrics, as discussed in section 5. ⁴ The empirical analysis finds a positive (but insignificant) relationship between GDP and firm performance post-distress but a negative relationship between GDP and survival rates over the first three years following distress. The latter finding appears to be driven by limited time-series variation but high cross-country variation in the sample. When the analysis is conducted on selected Member States, there is evidence of a positive relationship for survival rates as well (as discussed in section 5). * indicates a weaker relationship.

Source: Oxera analysis in sections 5, 6 and 7 of this report.

The generic illustration that emerges from mapping the findings in this way is that a firm in distress is *more likely* to survive if:

- it is a large, non-manufacturing firm with non-firm-specific assets and a more modular corporate structure that allows divisions to be sold off to raise cash;
- it has experienced limited losses at the point of distress;
- it has experienced a smaller deterioration in financial performance pre-distress (for a given level of severity of distress);
- it has lower gearing, better access to capital (whether from private investors or capital markets), and a simpler debt structure than its peers;
- it operates in a country or countries with relative flexible labour markets.

Previous sections contain a more detailed interpretation of these findings.

8.5 Illustration of mapping Oxera findings onto the counterfactual for firm-level output and employment

Table 8.3 illustrates how the findings from econometrics, case studies and literature can be mapped onto counterfactuals for firm output and employment. A possible application of Table 8.3 is to examine the characteristics of a case and check which column best fits the data—'positive' or 'negative'. Employment and output outcomes tend to follow the same direction, which is why they are presented in the same table. Any key differences are pointed out in the notes to the table.

Table 8.3 Illustration of factors relevant to determine a ‘positive’ or ‘negative’ counterfactual scenario based on determinants of firm output and employment post-distress

	‘Positive counterfactual’— firm is more likely to increase output and employment post-distress	‘Negative counterfactual’— firm is more likely to decrease output and employment post-distress	Source of result
A. Firm, sector and country characteristics			
Industry	Non-manufacturing	Manufacturing	E, L
Firm size	Small firm	Large firm	E ¹
Concentration in industry	Non-concentrated market	Concentrated market	L
Assets can be redeployed to alternative uses	High asset substitutability	Low asset substitutability	L
Ease with which individual business units can be sold	Firm has some relatively stand-alone divisions to divest	Firm is highly integrated—divestiture of business units difficult	L, C
Insolvency code*	For example, UK or Nordic insolvency code	For example, French or German insolvency code	L, C
B. Firm performance (asset side)			
Performance as at distress	Lower losses at point of distress	High losses at point of distress	E ² , L, C
Change in performance prior to distress	Smaller deterioration in earnings prior to distress	Greater deterioration in earnings prior to distress	E ²
Growth in firm’s output prior to distress	Slower growth in output prior to distress	Higher growth in output prior to distress (over-expansion)	E ³ , C
C. Financial structure (liabilities side)			
Gearing*	Low gearing	High gearing	E, L, C
Access to capital	Good access to capital, including private capital	Poor access to capital, including private capital	C

Notes: E, empirical analysis (econometrics); L, literature, C, case studies. ¹ In some instances, the definition of size adopted in the literature may differ from the Commission’s criteria. For this aspect, less weight should be placed on the (contrary) finding from the literature compared with the results from the empirical analysis. ² The results from the empirical analysis are estimated with reference to the average distressed firm in the same sector, controlling for economic and sector conditions as well as levels of gearing. For example, the results imply that under a hypothetical scenario where two distressed firms in the same sector face similar macroeconomic conditions and levels of gearing, the firm that is more severely distressed will experience a greater reduction in output and employment following the onset of distress. ³ The empirical analysis finds that the relationship between growth in firms’ output prior to distress and outcomes post-distress is a more significant determinant of output outcomes than employment outcomes. * indicates a weaker relationship.

Source: Oxera analysis in sections 5, 6 and 7 of this report.

The generic illustration that emerges from the firm-level findings is that a firm in distress is *more likely* to sustain output and employment if:

- it is a smaller non-manufacturing firm in a non-concentrated market where rivals cannot adopt predatory strategies against the firm in distress;
- it is a firm which employs assets that can more easily be redeployed to alternative uses, and has some business units which can be divested to raise cash in the event of distress. Should the firm become insolvent, it (possibly) has a better chance of sustaining output and employment if it faces a UK- or Nordic-type insolvency code;
- it has experienced a smaller decline in earnings prior to distress;
- it is in a less severe state of distress;

- it has not experienced rapid growth in output prior to distress (in this instance, smaller reductions in output are expected post-distress);
- it has lower gearing and good access to capital markets or private capital.

Previous sections contain a more detailed interpretation of these findings.

8.6 Illustration of mapping Oxera findings onto the counterfactual for spillover effects of distress

Table 8.4 summarises the findings on firm output and employment. All findings are expressed here with respect to the establishment, not the firm, since spillover effects are region-specific.

Table 8.4 can be used to check the characteristics of a case against the Oxera findings, in order to form expectations on the counterfactual.

Table 8.4 Illustration of factors relevant to determine a ‘positive’ or ‘negative’ counterfactual scenario based on determinants of spillover effects

	‘Positive counterfactual’— wider negative output/employment effects are less likely	‘Negative counterfactual’— wider negative output/employment effects are more likely	Source of result
A. Firm, sector and country characteristics			
Firm size	Small firm	Large firm	L
Concentration in region	Firm is not a major local employer	Firm employs a high proportion of local workforce	C
Capacity utilisation	Industry has high capacity utilisation	Industry has significant spare capacity	E ¹
Assets can be redeployed to alternative uses	High asset substitutability	Low asset substitutability	L
Non-specialised product base	Suppliers to a firm in distress have opportunities to switch customers	Suppliers to a firm in distress are heavily dependent on that customer	L
Ease with which individual business units can be sold	Firm has some relatively stand-alone divisions to divest	Firm is highly integrated—divestiture of business units difficult	L, C
B. Firm performance (asset side)			
Performance as at distress	Lower losses at point of distress	High losses at point of distress	L
D. Market conditions (post-distress)			
Growth of sectoral GVA post-distress	High growth in sector GVA	Low growth in sector GVA	C
E. Workforce, labour market characteristics			
Workforce characteristics	Greater proportion of workers are: low tenure or highly educated	Lower proportion of workers are: low tenure or highly educated	L
Substitutability of human capital	Establishment’s workforce has skills that are difficult to replicate elsewhere	Establishment’s workforce has skills that are easy to replicate elsewhere	C
Productivity of workforce (GVA/employee) ²	High GVA per employee	Low GVA per employee	E
Local unemployment	Low level of local unemployment	High level of local unemployment	L, C
Training programme for displaced workers	Training available	Training not available	C

Notes: E, econometrics; L, literature, C, case studies. ¹ Wider effects are reinforced in regions where there is spare capacity. This may indicate that displaced workers face greater difficulties finding re-employment if demand conditions are relatively unfavourable. Capacity utilisation is not necessarily a time-invariant factor and hence the Commission could seek forecasts of this factor for the sector in question. Hence, capacity utilisation could also be classified under part D of the table: ‘Market conditions (post-distress)’. ² In terms of ‘productivity of workforce’, the effect of redundancies is reinforced if distressed establishments are part of industries that are characterised by low labour productivity, which may be indicative of relatively low capital intensity. To the extent that low productivity is also related to relatively low skill levels, this might also indicate that the skills of employees in such industries are less readily transferable to alternative employment opportunities. Productivity of workforce is not only a characteristic of the workforce—capital intensity is also a determinant of productivity. Hence, productivity could also be classified under part A of the table: ‘Fixed characteristics (firm, sector and country)’.
Source: Oxera analysis in sections 5, 6 and 7 of this report.

The generic illustration that emerges from the spillover effect findings is that distress is less likely to generate wider negative consequences if:

- it is a small firm which does not employ a high proportion of the local workforce;
- its assets are not firm-specific but can be substituted to other firms (for example, a retail unit);
- its business units are easily divested rather than highly integrated, and its suppliers have many other customers to which they can switch production if the firm in distress shuts down or cuts output;
- the capacity utilisation rate for its sector in its country is high relative to other countries;
- its financial distress is less severe;
- it operates in a sector with high future growth prospects;
- its workforce has a higher proportion of low tenure and/or highly educated employees;
- its workforce has skills which are difficult to replicate elsewhere (eg, by moving production overseas);
- its region is characterised by low unemployment and the availability of training for displaced workers;
- it has high value added per employee, either as a result of high capital intensity or a highly skilled workforce.

Previous sections contain a more detailed interpretation of these findings including a more complete list of factors. In order to apply the Oxera findings, it may be useful for state aid practice to develop a database which locates information on key variables for spillover effects, such as regional employment, capacity utilisation and sector growth forecasts.

8.7 Summary of implications for restructuring aid case practice

The existing Rescue and Restructuring Aid Guidelines refer to the relevance of determining that aid is the only route to survival and forming an expectation that the net employment consequences of distress will be significantly negative.¹⁶⁷ This is supported by the EAGCP's paper commenting on the Guidelines, which sets out two questions:¹⁶⁸

- what would happen to the firm's assets if no aid were granted?; and
- what would be the social implications of any sudden loss of jobs for the locality?

The results of this study assist with addressing these questions, providing a methodology to inform the counterfactual on survival, firm output and employment, as well as on the wider employment effects of distress. This can be applied either in relation to the approval of aid in specific cases, or to inform general policy on the prioritisation of aid to markets and circumstances where the negative effects of distress are likely to be greater. The results also help with understanding where the impacts of distress are less likely to be felt.

In practice, the Commission may not always face the full task of constructing the counterfactual. It may be more likely that Member States will present most of the relevant information, and the decision with regard to the aid approval may be a choice between two or

¹⁶⁷ European Commission (2004b), paras 9, 11, 31.

¹⁶⁸ Economic Advisory Group on Competition Policy (2008), p. 9.

more potential aid beneficiaries. In these cases, the benefit of the Oxera report could be to provide information about the relevant economic considerations for selected dimensions along which the potential aid beneficiaries actually differ. In such cases, attention might not be focused on completing the information set relevant to survival or firm output and employment, but rather the focus would be narrower on just a few key variables associated with spillover effects. For example, it may be that the relevance of the counterfactual to aid would mainly turn on:

- the relative capacity utilisation of two aid beneficiaries, as a factor to inform the relative spillover effects on employment; or
- the relative productivity rates of two aid beneficiaries, also as a factor to inform the relative spillover effects on employment.

In cases where the key variables cannot be isolated in this way, it would not be appropriate to collect all the information set and then generate mechanistic predictions. Rather, the suggested methodology is to use the information set as a baseline for the counterfactual. The next step is to look at the specific features of the case and decide where the most important relationships are located for that particular case.

Finally, the application of the findings from this study would generate no more than a rebuttable presumption on the counterfactual. In that respect, the particular circumstances of each case could create variation away from the general relationships set out in the Oxera results.

Beyond restructuring aid case practice, this study also has potential implications for capital markets, labour markets and bankruptcy codes. As set out in earlier sections, the negative effects of distress can be mitigated when these capital and labour markets work more effectively, and when bankruptcy codes provide an efficient means of resolving the position of a firm in distress. Improving the efficiency of 'private aid' (ie, private investments) would tend to reduce the need for state aid.

APPENDICES

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A2 Structured interviews with insolvency practitioners

A2.1 Interview template

Company:

Name:

Job title:

Contact details:

Oxera staff present:

Date:

Introduction

The study is intended to investigate the various stages and drivers of financial distress and restructuring, including an assessment of the likelihood of various restructuring outcomes, given observable ex ante drivers of financial difficulty. An important objective of the study is to understand the effects of different restructuring processes on the form of exit (eg, sale as going concern, piecemeal liquidation) of the bankrupt companies and the implications it may have for output and employment.

This study is very important for the European Commission, especially in the current market context but also with significant policy implications for the many years to come.

Structure of the interview

Insolvency process

- key characteristics of insolvency process in the IP’s jurisdiction.
- what type of insolvency process is most common in occurrence?
- comparison of the insolvency process in the IP’s jurisdiction to those in other European jurisdictions (eg, UK, France, Germany).

General trends

- any general trends/developments that are specific to a sector/jurisdiction?
- do informal and formal restructuring processes lead to different outcomes?
- in cases of asset sales, how does recovery value vary with the length/form of restructuring?
- does the degree of job/output loss vary significantly across sectors?

Specific cases

- examples of major restructuring cases in the IP’s jurisdiction.
- sources of public information for court filings.

About Oxera

Oxera is an independent economics consultancy—one of the largest in Europe—with an international reputation for integrity, intellectual rigour and work of the highest quality. We are driven to preserve our objectivity and integrity. Oxera is completely independent in both ownership and delivery of our analysis. As we are not tied to any one client, investor or sector, we offer unbiased, credible results, and often act as an intermediary/facilitator to two or more points of view.

A2.2 Interviews held

For the purposes of this study, Oxera has conducted interviews with insolvency practitioners across different European jurisdictions. The interviews undertaken for this study are detailed below.

Organisation name	Organisation type	Name of interviewee	Position	Jurisdiction	Interview date	Affiliations
Ernst & Young	Law firm	Lawrie Cooper	Assistant Director	United Kingdom	March 20th 2009	
Clifford Chance	Law firm	Tomas Richter	Of Council	Czech Republic	April 22nd 2009	INSOL
White & Case	Law firm	Lech Giliciński	Partner	Poland	April 28th 2009	INSOL
Freshfields Bruckhaus Deringer	Law firm	Lars Westpfahl	Partner	Germany	June 18th 2009	INSOL
Salans	Law firm	Anna Maria Pukszto	Partner	Poland	June 26th 2009	INSOL
Studio Bernoni	Law firm	Stefano Salvadeo	Corporate partner	Italy	June 29th 2009	INSOL
SJ Berwin	Law firm	Nicolas Theys	Partner	France	June 29th 2009	INSOL
Aszódi & Pocze	Law firm	Ilona Aszódi	Lawyer	Hungary	July 6th 2009	INSOL
Urge & Cernohlavek	Law firm	Dr Cernohlavek	Lawyer	Czech Republic	July 13th 2009	INSOL
BGN Sollers	Consultancy	Zbigniew Fornal		Poland	July 17th 2009	INSOL
Rechtsanwältin & Abogado	Law firm	Stefanie Endres	Lawyer	Spain	July 20th 2009	INSOL

Source: Oxera.

A3 Further detail on the firm-level analysis

The purpose of this appendix is to present further detail on the firm-level analysis reported in section 5. The additional analysis presented here discusses results for all Member States excluding the UK—the country with the largest number of observations and for a longer time period over which the performance of surviving firms is examined.

A3.1 Sensitivity analysis—excluding UK observations

The firm-level econometrics reported in section 5 controls for differences in coverage across Member States through the use of weighted regression models, where the weights are defined according to each Member States' GDP. This represents an appropriate approach as it takes into account the full variation across the dataset.

However, as a check on the robustness of the results, a sensitivity analysis has been undertaken excluding all UK observations from the firm-level dataset (and hence, the results).

A3.1.1 What explains a firm's survival following distress?

The results reported in Table A3.1 below show that the factors that were found to explain survival outcomes across all Member States (as reported in section 5) are robust to the exclusion of the UK from the dataset.

Box A3.1 Selected observations from the empirical analysis of survival rates (excluding UK observations)

Firm performance

- Similar to the results based upon the full sample, firms growing faster prior to distress appear to be more likely to survive financial difficulties.
- There is some weak evidence to suggest that greater severity of distress is associated with lower probability of survival post-distress.
- For the same level of severity of distress, better financial performance prior to distress tends to be associated with lower probability of survival following distress.
- Higher revenue growth prior to distress appears to be associated with higher survival rates.

Financial structure

- Firms that adopt a more aggressive financial structure as at distress (as measured by financial leverage) are less likely to survive in the short term.
- The impact of higher financial leverage is also a weaker determinant of survival in the longer term.

Firm characteristics

- Larger firms are more likely to survive than smaller ones post-distress.
- Firms operating in the manufacturing sector are less likely to survive.

Table A3.1 What explains a firm's survival post-distress (non-UK firms)?

Dependent/independent variables		Survival during the first year following distress				Survival during the first three years following distress			
Performance prior to distress									
Change in output (change in revenue)		0.031*	0.032*	0.030*	0.029*				
Change in performance (change in EBIT/assets)		0.033				0.057			
Gross return on assets (EBIT/assets)		-0.152**			0.268				
Gross return to debt holders (EBIT/liabilities)		-0.092**			0.125				
Net return to shareholders (net income/capital)		-0.005			0.008				
Performance at distress (severity)									
Gross return on assets (EBIT/assets)		0.020			0.150				
Gross return to debt holders (EBIT/liabilities)		-0.006			0.149				
Net return to shareholders (net income/capital)		0.000			0.002**				
Financial structure at distress									
Gearing (debt/assets)		-0.045***	-0.044***	-0.046***	-0.048***	-0.127*	-0.131*	-0.131*	-0.139*
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.032	-0.034*	-0.033*	-0.032	-0.026	-0.043	-0.038	-0.031
	3rd quartile	0.001	0.000	0.002	0.001	0.079	0.080	0.083	0.084
	4th (largest) quartile	0.035***	0.031**	0.031**	0.036***	0.072	0.072	0.070	0.074
Sector	Manufacturing	-0.017	-0.018	-0.018	-0.016	-0.087*	-0.092*	-0.092*	-0.090*
Domicile	New Member State	0.022	-0.031	-0.034	-0.028	0.107	0.106	-0.121*	0.095
Market conditions									
Economic performance (GDP)		0.545	0.542	0.590	0.456	-14.096***	-14.670***	-13.945***	-14.492***
Sector performance (GVA)		0.026	0.021	0.015	0.025	0.028	0.085	0.108	-0.005
Number of firms		882	878	878	881	885	880	885	879
Log pseudo likelihood		-149.993	-146.312	-147.250	-149.683	-348.438	-343.294	-346.099	-344.739

Note: The data is weighted, using each Member States' GDP to ensure that the composition of the sample does not place too much weight on a particular Member State. The UK has been excluded from this analysis. The first stage of the Heckman model is a probit regression of survival rates on the explanatory factors, which is estimated through maximum likelihood. Due to the non-linear nature of the probit function, the relationship between the explanatory factors and firm survival rates is also non-linear, implying that the marginal impact of a small change in an explanatory factor on the probability of survival will vary across firms. For example, the marginal impact of a change in gearing on the probability of survival will be different for a firm whose gearing is 30% than for one with 80% gearing. The estimates presented in this table represent the average value of the marginal impacts of each explanatory factor across all firms in the sample. A positive value implies that, across all firms, a marginal increase in the explanatory factor will, on average, tend to increase the probability of survival. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

A3.1.2 What explains changes in employment post-distress?

The key drivers of employment outcomes post-distress are similar to the results for the full sample. However, the strength of some findings is weakened when UK observations are excluded (most likely due to a reduced number of observations).

Box A3.2 Selected observations from the empirical analysis of employment (excluding UK observations)

Firm performance

- There is some weak evidence to indicate that the more severely distressed firms—as measured by EBIT/assets and EBIT/liabilities as at the year of distress— may experience more negative employment outcomes. However, this relationship is no longer statistically significant when UK observations are excluded from the analysis.

Financial structure

- Similar to the results based upon the full sample, higher leverage prior to distress is not significantly associated with employment outcomes following distress.

Firms' characteristics

- Larger firms exhibit deeper cuts and slower recovery in employment post-distress.
- Firms operating in the manufacturing sector are likely to experience poorer employment outcomes after the onset of distress relative to firms operating in other sectors.
- Outcomes are more negative for those firms domiciled in the 12 new Member States.

Market conditions

- Economic and sector performance are not significantly associated with employment outcomes following distress.

Table A3.2 What explains changes in employment post-distress? (Non-UK firms, two-stage regressions)

Dependent/independent variables		% change in employment: one year prior to distress to one year post-distress				% change in employment: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Change in output (change in revenue)		0.047	0.042	0.050	0.057				
Change in performance (change in EBIT/assets)		0.114				0.009			
Gross return on assets (EBIT/assets)			0.204				0.234		
Gross return to debt holders (EBIT/liabilities)				0.019				0.128	
Net return to shareholders (net income/capital)					0.006				-0.002
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.163				0.076		
Gross return to debt holders (EBIT/liabilities)				0.136				0.084	
Net return to shareholders (net income/capital)					-0.001***				-0.002*
Financial structure at distress									
Gearing (debt/assets)		0.117	0.095	0.090	0.028	-0.025	-0.012	-0.038	-0.011
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.052	-0.051	-0.055	-0.081	-0.194***	-0.198***	-0.204***	-0.197***
	3rd quartile	-0.142***	-0.136***	-0.138***	-0.148***	-0.316***	-0.309***	-0.313***	-0.317***
	4th (largest) quartile	-0.207***	-0.210***	-0.210***	-0.196***	-0.373***	-0.374***	-0.377***	-0.369***
Sector	Manufacturing	-0.050	-0.051	-0.049	-0.057	-0.096*	-0.103*	-0.104*	-0.098*
Domicile	New Member State	-0.141***	-0.131***	-0.119**	-0.169***	-0.289***	-0.262***	-0.272***	-0.281***
Market conditions									
Economic performance (GDP outperformance)		0.876	0.916	1.045	1.210	2.817	3.508	3.436	2.817
Sector performance (GVA)		-0.599	-0.572	-0.590	-0.684	-0.246	-0.304	-0.325	-0.266
Number of firms		903	847	849	901	907	908	904	905
Log pseudo likelihood		-640.429	-633.667	-640.692	-627.119	-949.762	-949.053	-944.103	-948.073

Note: The data is weighted, using each Member States' GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. The UK has been excluded from this analysis. These results correspond to the second-stage estimates of the Heckman selection model, which is estimated through maximum likelihood. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

A3.1.3 What explains changes in output post-distress?

The results regarding the key drivers of output outcomes post-distress have been found to be robust to the approach that is used to control for variation in the coverage of Member States in the sample (as reported in Box A3.3).

Box A3.3 Selected observations from the empirical analysis of output (excluding UK observations)

Firm performance

- Firm performance pre-distress is a significant determinant of changes in output following distress, particularly in the short term.
- Firms whose revenues have been growing faster prior to distress are likely to experience a greater reduction in revenues following the onset of distress.
- Firms that experience more severe distress are associated with poorer revenue outcomes.

Financial structure

- There is some weaker evidence that higher financial leverage prior to distress is significantly associated with longer-term revenue outcomes following distress.

Firm characteristics

- Larger firms' revenues tend to grow more slowly following the onset of distress.
- Manufacturing firms experience poorer revenue outcomes relative to firms operating in other sectors.

Market conditions

- Economic and sector performance are not significantly associated with revenue outcomes following distress.

Table A3.3 What explains changes in output post-distress? (non-UK firms, two-stage regressions)

Dependent/independent variables		% change in revenues: one year prior to distress to one year post-distress				% change in revenues: three-year average prior to distress relative to three-year average post-distress			
Performance prior to distress									
Change in output (change in revenue)		-0.130***	-0.129***	-0.087**	-0.136***				
Change in performance (change in EBIT/assets)		0.480***				0.294***			
Gross return on assets (EBIT/assets)			-0.415**				-0.091		
Gross return to debt holders (EBIT/liabilities)				-0.354**				-0.089	
Net return to shareholders (net income/capital)					-0.020				0.002
Performance at distress (severity)									
Gross return on assets (EBIT/assets)			0.520***				0.396***		
Gross return to debt holders (EBIT/liabilities)				0.421***				0.312***	
Net return to shareholders (net income/capital)					-0.001***				-0.004***
Financial structure at distress									
Gearing (debt/assets)		0.103	0.099	0.028	0.072	0.206	0.229*	0.093	0.221*
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	-0.069**	-0.068**	-0.087***	-0.079**	-0.133***	-0.128***	-0.136***	-0.141***
	3rd quartile	-0.139***	-0.137***	-0.138***	-0.159***	-0.193***	-0.185***	-0.196***	-0.187***
	4th (largest) quartile	-0.158***	-0.159***	-0.135***	-0.154***	-0.239***	-0.241***	-0.252***	-0.212***
Sector	Manufacturing	-0.064*	-0.060	-0.070*	-0.058	-0.077	-0.071	-0.072	-0.092*
Domicile	New Member State	-0.016	-0.010	-0.016	-0.036	-0.049	-0.033	-0.054	-0.036
Market conditions									
Economic performance (GDP outperformance)		1.335	1.280	1.761	1.950	2.841	4.389	3.860	-0.176
Sector performance (GVA)		0.351	0.423	0.345	0.081	0.268	0.416	0.319	0.112
Number of firms		882	878	878	881	885	880	885	879
Log pseudo likelihood		-318.488	-308.966	-320.913	-348.038	-631.162	-616.255	-621.965	-624.513

Note: The data is weighted, using each Member States' GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. The UK has been excluded from this analysis. These results correspond to the second-stage estimates of the Heckman selection model, which is estimated through maximum likelihood. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The reason why the change in output cannot be included in the three-year models is explained in section 5.6.1. The regressions include the control variable for those firms that enter distress in 2005 (as described in section 5.5.3).

Source: Oxera analysis based on Bureau Van Dijk data.

A3.2 Firm performance up to five years after the onset of distress

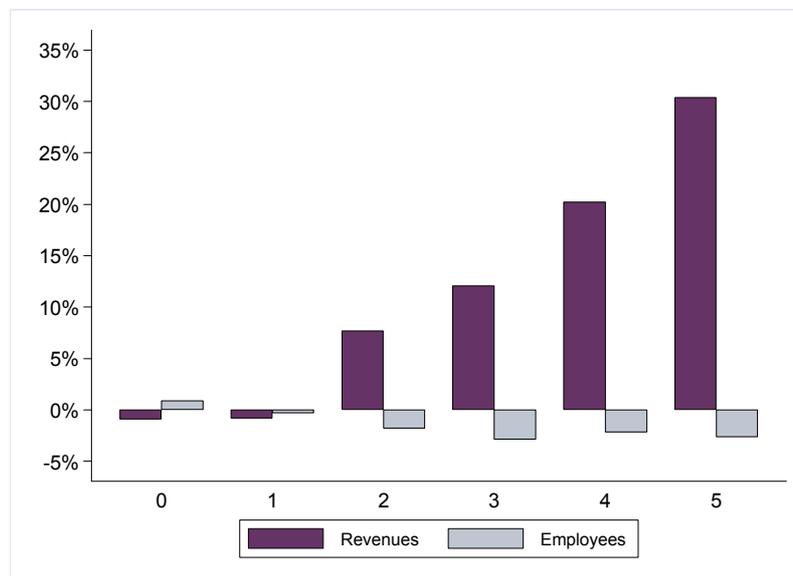
This section expands upon the analysis of firms' performance reported in section 5 to consider developments for surviving firms up to five years after the onset of distress.

The key results are similar to the findings for the sample of firms that survive up to three years after the onset of distress. There are some minor differences in terms of the key findings, which appears to be driven by differences in composition of the three- and five-year samples of surviving firms.

A3.2.1 Firm performance post-distress for surviving firms

The pattern in revenues and employment that is observed for surviving firms three years after the onset of distress is similar if extended to include the fourth and fifth years after the onset of distress. As shown in Figure A3.1, the recovery in revenues continues into the fourth and fifth year after the onset of distress, whilst there is little change in employment over the same period.

Figure A3.1 Development of output and employment over the five years following distress for surviving firms (% change relative to one year prior to distress)

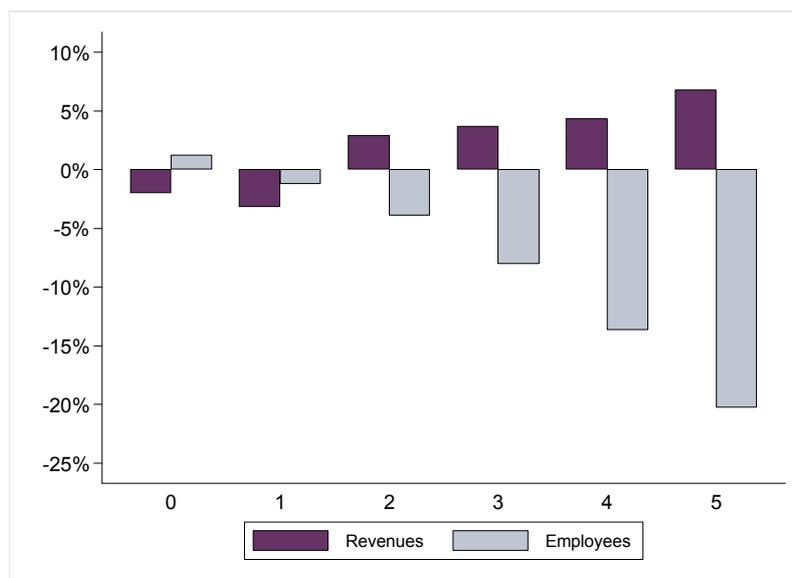


Note: Average revenues and employment have been calculated with reference to the mean.
Source: Oxera analysis based on Bureau Van Dijk data.

A3.2.2 Overall development of output and employment for all firms

The performance (output and employment) across all firms (both surviving and non-surviving firms) in the sample is reported in Figure A3.2. This indicates that the same trend—eg, recovering revenues and falling employment—that is observed three years after the onset of distress continues into the fourth and fifth year.

Figure A3.2 Evolution of output and employment over the five years following distress (% change relative to the year prior to distress)



Note: Average revenues and employment have been calculated with reference to the mean.
Source: Oxera analysis based on Bureau Van Dijk data.

A3.2.3 What explains a firm's survival following distress?

The drivers of firm's survival over five years after the onset of distress are examined in this section.

Box A3.4 Selected observations from the empirical analysis of survival rates (up to five years after distress)

Firm performance

- There is some weak evidence to suggest that greater decline in performance prior to distress is associated with lower likelihood of survival post-distress.
- However, in contrast to the results based upon survival over either one or three years after the onset of distress, greater severity of distress is not significantly associated with a lower probability of survival over the subsequent five years.

Financial structure

- A more aggressive financial structure at distress (as measured by higher financial leverage) is associated with lower survival rates.

Firm characteristics

- In contrast to the results based upon survival over either one or three years following distress, there is no statistically significant evidence to indicate that the size of the firm helps determine survival outcomes.
- Firms operating in the manufacturing sector are less likely to survive, on average.

Market conditions

- Firms in difficulty operating in countries with higher GDP growth have lower survival rates.

Table A3.4 What explains a firm's survival post-distress? (Two-stage regressions)

Dependent/independent variables		Survival during the five years following distress			
Performance prior to distress					
Change in performance (change in EBIT/assets)		-0.013			
Gross return on assets (EBIT/assets)		-0.080			
Gross return to debt holders (EBIT/liabilities)		-0.028			
Net return to shareholders (net income/capital)		-0.007**			
Performance at distress (severity)					
Gross return on assets (EBIT/assets)		-0.072			
Gross return to debt holders (EBIT/liabilities)		-0.058			
Net return to shareholders (net income/capital)		0.001			
Financial structure at distress					
Gearing (debt/assets)		-0.090**	-0.091**	-0.084**	-0.074**
Firm characteristics					
Size (relative to smallest quartile)	2nd quartile	0.028	0.023	0.024	0.027*
	3rd quartile	0.009	0.004	0.006	0.010
	4th (largest) quartile	-0.016	-0.015	-0.013	-0.013
Sector	Manufacturing	-0.031	-0.034	-0.032	-0.023
Domicile	New Member State	-0.003	-0.010	-0.009	0.004
Market conditions					
Economic performance (GDP)		-3.365*	-3.650**	-3.471*	-3.126**
Sector performance (GVA)		-0.355	-0.433	-0.406	-0.254
Number of firms		280	280	280	280
Log pseudo likelihood		-40.007	-39.252	-39.644	-38.044

Note: The data is weighted, using each Member States' GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. The first stage of the Heckman model is a probit regression of survival rates on the explanatory factors, which is estimated through maximum likelihood. Due to the non-linear nature of the probit function, the relationship between the explanatory factors and firm survival rates is also non-linear, implying that the marginal impact of a small change in an explanatory factor on the probability of survival will vary across firms. For example, the marginal impact of a change in gearing on the probability of survival will be different for a firm whose gearing is 30% than for one with 80% gearing. The estimates presented in this table represent the average value of the marginal impacts of each explanatory factor across all firms in the sample. A positive value implies that, across all firms, a marginal increase in the explanatory factor will, on average, tend to increase the probability of survival. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The change in output cannot be included in the five-year models for the same reasons as provided in section 5.6.1. The control variable for firms that enter distress in 2005 is not included—these firms are not present in the dataset, as 5-years data is required following the onset of distress for the five-year models.

Source: Oxera analysis based on Bureau Van Dijk data.

A3.2.4 What explains changes in employment and revenue post-distress?

The drivers of employment and revenue outcomes five years after the onset of distress have also been examined. The main results have been found to be similar to the findings of the drivers of outcomes three years after the onset of distress.

Box A3.5 Selected observations from the empirical analysis of output and employment (up to five years after distress)

Firm performance

- Severity of distress has a significant impact on reductions in revenue (but not output) following the onset of distress.
- There is some weak evidence to suggest that firm performance prior to distress influences employment and output outcomes following distress.

Financial structure

- Higher leverage prior to distress is significantly associated with employment and revenue outcomes following distress.

Firms' characteristics

- Larger firms exhibit deeper cuts and slower recovery in employment and revenues post-distress.
- No evidence to suggest that manufacturing firms experience poorer employment or revenue outcomes relative to firms operating in other sectors.

Market conditions

- Economic and sector performance is not significantly associated with employment outcomes following distress.
- However, a negative relationship between GDP and revenue outcomes can be observed. This may be explained by the limited time series variation in the sample, which means that the 'true' impact of GDP on outcomes cannot be observed fully.
- There is also a statistically significant positive relationship between sector performance and revenues outcomes.

Table A3.5 What explains changes in employment and output post-distress? (Two-stage regressions)

Dependent/independent variables		% change in employment: three-year average prior to distress relative to five-year average post-distress				% change in output: three-year average prior to distress relative to five-year average post-distress			
Performance prior to distress									
Change in performance (change in EBIT/assets)		-0.176				0.289			
Gross return on assets (EBIT/assets)		0.470*				0.061			
Gross return to debt holders (EBIT/liabilities)		0.341				-0.057			
Net return to shareholders (net income/capital)		n/a				0.000			
Performance at distress (severity)									
Gross return on assets (EBIT/assets)		-0.013				0.594***			
Gross return to debt holders (EBIT/liabilities)		-0.121				0.363***			
Net return to shareholders (net income/capital)		n/a				-0.001***			
Financial structure at distress									
Gearing (debt/assets)		0.395***	0.346**	0.421**	n/a	0.413***	0.365***	0.112	0.427***
Firm characteristics									
Size (relative to smallest quartile)	2nd quartile	0.009	0.029	0.021	n/a	-0.133*	-0.126*	-0.104	-0.129*
	3rd quartile	-0.224***	-0.217***	-0.228***	n/a	-0.323***	-0.289***	-0.296***	-0.329***
	4th (largest) quartile	-0.407***	-0.423***	-0.421***	n/a	-0.394***	-0.397***	-0.420***	-0.345***
Sector	Manufacturing	0.042	0.074	0.067	n/a	0.086	0.083	0.041	0.095
Domicile	New Member State	-0.281**	-0.268**	-0.264**	n/a	0.243*	0.282**	0.227	0.266**
Market conditions									
Economic performance (GDP)		5.927	7.904	6.467	n/a	-12.727**	-10.247	-14.459*	-13.263**
Sector performance (GVA)		0.210	0.952	0.529	n/a	3.552**	4.001**	3.200*	3.509**
Number of firms		277	276	275	n/a	280	280	280	280
Log pseudo likelihood		-137.241	-137.208	-138.166	n/a	-137.640	-132.567	-126.789	-126.287

Note: The data is weighted, using each Member States' GDP, to ensure that the composition of the sample does not place too much weight on a particular Member State. These results correspond to the second-stage estimates of the Heckman selection model, which is estimated through maximum likelihood. The model is estimated on the basis of the full maximum likelihood estimator. *** significant at the 1% level; ** 5% level; * 10% level. Empty cells indicated that these variables have not been included in the regression. As diagnostic tests indicated the presence of non-constant variances, robust variance estimators have been used to calculate significance levels. The exact definition of the variables is provided in section 5.5. The change in output cannot be included in the five-year models for the same reasons as provided in section 5.6.1. The control variable for firms that enter distress in 2005 is not included—these firms are not present in the dataset, as 5-years data is required following the onset of distress for the five-year models.

Source: Oxera analysis based on Bureau Van Dijk data.

Oxera

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