

Stock Market Reaction to Layoff Announcements: European Evidence (2002-2010)

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Abstract: The stock market reaction to layoff announcements depends on investors' perception regarding the information contained in these announcements. In this paper, we examine this reaction using a new sample of restructuring announcements occurred in different European countries, over the period 2002-2010. The results reveal an overall negative, but not significant, market reaction of -0.177% for a three days event window. However, extending the analysis to specific layoff characteristics and to other variables characterizing sectorial and macroeconomic environment of restructuring countries we find that the stock market reaction is significantly correlated with the reasons stated into announcement, the frequency of layoffs occurrence and macroeconomic context. Moreover, some specific labor market indicators, like employment protection legislation, labor cost and unemployment reveal a significant impact on stock price reaction.

Keywords: Layoff announcements, downsizing, corporate governance, event study

JEL Codes: G14, J5.

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1. Introduction

During the last decades, companies have used different ways to improve their performances and to react to new market conditions. The reduction in labor force is one of the most used strategies for cost cutting, productivity increase or for facing diminishing demand and financial losses.

The economic and financial effects generated by the layoffs can be analyzed in two different ways: as a reaction of the stock prices to a layoff announcement or as a change in the level of different specific indicators for firm's performance. The stock market reaction studies (Worrell *et al.*, 1991; Lee, 1997; Franz, 1998; McKnight *et al.*, 2002; Farber and Hallock, 2009) found that this reaction (measured by the abnormal return) can be either positive or negative depending on the perception of investors regarding the layoff decision. Thus, in order to explain the sign and the magnitude of this reaction we need to identify the factors taken into consideration by an investor in the case of a mass layoff. In a general manner, the market reaction can be interpreted in two ways: a negative reaction due to the fact that layoff announcement is perceived as a consequence of the financial problems faced by a company, or a positive reaction when the layoff decision is associated with an improvement in the firm's efficiency. Thus, overall price reaction is determined by the dominated effect of these two perceptions. Abraham and Kim (2004) test four theoretical models that are able to explain the stock price reaction (Labor-Cost Hypothesis, Efficiency Hypothesis, Industrial-Relation-Effect Hypothesis and Signaling-Effect Hypothesis) for a sample of 368 layoff announcement in 1993-1994, finding a negative net effect on stocks returns. A similar idea is expressed by Wertheim and Robinson (2004) who consider that the market reaction to a layoff announcement may contain a negative perception regarding the financial situation of a firm, but also a positive perception from the point of view of costs reduction and profit growth.

Although there are arguments for a positive reaction (Abowd *et al.*, 1990), most studies found a negative stock price change to layoff announcements. As layoffs may induce additional problems for the remaining employees like job insecurity and guilt (Brockner, 1988) the goals of costs reduction and efficiency growth became more difficult to obtain. Also, a downsizing strategy can generate a loss in the level of human capital. Sirmon, Hitt and Ireland (2007) argue that downsizing signals a loss of valuable knowledge, especially in the case of large downsizings. Nixon *et al.* (2004) show that the negative market reaction to layoffs can be ameliorated by

implementing reallocation strategies which allow to maintain the firm's valuable human capital. Studies that were interested on firm's future performance (Cascio, Young and Morris, 1997; Love and Nohria, 2005) obtained contradictory results. Other studies focus on both market reaction and future firm performance, reflecting the connection between the two faces of shareholders' wealth (Lin and Rozeff, 1993; Iqbal and Akhigbe, 1997; Chalos and Chen, 2002; Nixon *et al.*, 2004).

The aim of the present study is to identify the stock market reaction to layoff announcements using a new restructuring announcement sample concerning firms who applied restructuring measures in different European countries, over the period 2002-2010. The stock market reaction is measured by cumulative abnormal returns (CAR) which are obtained by implementing the event study methodology, widely used in finance.

The particularity of this study consists in the characteristics of the database, the multi-country dimension allowing us to extend our analysis in order to identify different patterns in stock market reaction. At this extent, we expect different reactions depending on the level of development of the country affected by restructuring and on the specific elements characterizing macroeconomic conjuncture. The restructuring cases concern companies listed on different stock markets, which allows us to test for particularities in investors' behavior. Moreover, as the database can be divided in two periods, before and during the crisis from 2007, we are able to search for changes in investors' perception concerning these measures. Taking into consideration all these aspects, the goal of this study is to answer to the following questions:

- How the stock markets react to layoff announcements on the short run?
- Is there a change in this reaction after the crisis from 2007?
- Does the reaction of stock market to layoff announcements depend on the reasons stated for these decisions?
- Does the reaction of stock market to layoff announcements depend on the sector of activity of the firm?
- Does the market react in a different way depending of the number of announcements made by a firm; there is a more negative reaction or a less positive reaction in the case of the first announcement?
- Is there a link between the investors' perception and the prior performance of the firm?

- Do stock prices react differently depending on the type of restructuring?
- Can country specific characteristics generate a different reaction in stock prices?
- Can we explain the layoff decision by some specific labor market characteristics?

We find evidence that overall stock market reaction is negative, but not significant. However, by including other characteristics regarding layoffs decisions and the global context in which these decisions were undertaken, we find that: 1) an important determinant of stock price reaction is the reason stated into announcement; 2) the investors' perception concerning the layoff decision changes depending on macroeconomic conjuncture; 3) the stock market reaction depends on frequency of layoff occurrence, being more negative in the case of the first announcement; 4) a plant closure announcements is no longer perceived as a negative sign by the investors; 5) The sector of activity, the firm size and the type of the stock market have no impact on price reaction; 6) Labor market indicators, as employment protection legislation, labor cost and unemployment can be counted as good proxies for investors' perception regarding the cause of restructuring.

The paper will be structured as follows. Section 2 will describe the research hypotheses. The database is presented in section 3, along with the event study methodology in section 4. Section 5 presents the results and their interpretation concluding with a brief summary in section 6.

2. Literature review and a set of testable hypotheses

Downsizing is a strategy frequently used by firms in their goals of performance improvement, as it is easier to obtain a short run cost reduction by controlling the level of labor force. Even if downsizing measures tend to improve firms' conditions through the cost reduction effect, the stock market reaction can be negative or positive depending on the investors' perception regarding the future performance of the company. The aim of this study is to verify the findings of prior studies using an original and extensive database of layoff announcements occurred in several European countries for the period 2002-2010, but also to extend the literature by testing new determinants of layoffs decision.

***H1:** The stock price reveals a negative reaction in the case of a layoff announcement for the entire sample*

A. The features of the layoffs announcements

There are several important studies that document the relationship between stock price reaction and layoff announcements and the importance of their characteristics. Worrell *et al.* (1991) using a sample of 194 announces for US companies find a negative stock price reaction to layoff announcements which range between -1,42 percent and -0,45 percent depending on the event window. Concerning the reasons stated for the layoffs, the authors have opted for two categories: financial distress and restructuring or consolidation, finding a significant negative reaction for the first reason and non-significant negative or positive reaction for the second one. Also, large layoffs induce a more negative reaction. A more detailed analysis was made by Elayan *et al.* (1998). They divided the entire announcements sample in sub-samples by reasons (proactive vs. reactive), by nature (permanent vs. temporary layoffs), by sector (industry vs. services) and by business cycle. They found that the market reaction is more negative in the case of reactive measures, large scale, services related, permanent and unanticipated layoffs or during the contraction phase of the business cycle. Lin and Rozeff (1993) divided the firms that announced the layoffs for cost-cuts reasons in two categories: those which are due to decrease demand situations and those which are due to increase efficiency situations. Thereby, the negative market reaction supports the demand decrease hypothesis. The results in the case of cost-cutting reasons show inconclusive results (Chan *et al.*, 1995; Chalos and Chen, 2002). Palmon, Sun and Tang (1997) find that in the case of firms that announced layoffs motivated by a declining demand, the abnormal returns are negative, but they are positive in the case of an efficiency improvement reason. Thus, the information incorporated in the announcement is a signal for the future performance measures. Also, layoffs can be viewed as proactive measures, as a firm initiative to improve efficiency or to prevent a potential slowdown and financial losses, or reactive measures, when the firms respond directly to deteriorating financial performance or weak market conditions, (Kalra *et al.*, 1994; Gunderson *et al.*, 1997; Mcknight, 2002). The elements presented above allow us to formulate two alternative hypotheses:

H2a: *The stock prices reveal a negative reaction if the layoff announcement states a reactive reason.*

H2b: *The stock prices reveal a positive reaction if the layoff announcement states a proactive reason.*

In the last period, a lot of companies adopted a strategy of successive layoffs announcement. In this case the signal perceived by the market may be different than in the case of a single announcement because it could be a sign that the first layoff was not sufficient to assure the firm's goal of improving efficiency. In general, the multiple layoff announcements suppose the existence of financial difficulties that cannot be solved by a single restructuring action. But the situation of multiple announcements can also be seen in a different manner: only the first announcement has a big impact on the investors' decision, the rest of the sequence announcements containing less information. Ursel and Armstrong-Stassen (1995) found a more negative stock price reaction for the initial downsizing announcement than for the subsequent announcements for the same firm. Similarly, Lee (1997) found that US investors react less negative in the case of multiples announcements.

H3: *The stock prices reveal a more negative (less positive) reaction in the case of the first layoff announcement made by a company.*

The layoff literature also analyzes some special types of restructuring, especially the case of plant closing, bankruptcy, merger and acquisition etc. The market reaction to a plant closing depends on the investor's perception concerning the reasons behind this decision. If the plant closing measure can be viewed as a way of obtaining a positive net present value, the market reaction is positive. But a plant closing can also be a signal of the existence of serious problems and a future decrease in the firm's performance. Blackwell, Marr and Spivey (1990) find a negative stock price reaction to plant closing announcements with a greater reaction in the case of profitability decrease announcements. Gambola and Tsetsekos (1992) showed that the market reaction at plant closing announcements is negative, especially in the case of intra-firm reasons and for the plants which are integrated with other firm's operations. The same conclusion was found by Chalos and Chen (2002), including the plant closing measure in the category of reactive measures. Hallock (1998) analyzed the stock market reaction to layoff announcements in the context of the relationship between CEOs compensation and layoffs. He finds that there is a

negative reaction, especially in the case of permanent layoffs. Concerning the reasons of the layoffs he found that in-house mergers have a positive and significant share price reaction and bankruptcy and plant closing reveal a negative effect. Another type of restructuring that gain in importance in the last period is offshoring. As the main reason behind these decisions is the reduction of costs and an increase in competitiveness, we expect a favorable market reaction. Thus, we can formulate the next two hypotheses:

H4: *The stock market reaction is negatively correlated with plant closing announcements.*

H5: *The stock market reaction is positively correlated with offshoring announcements.*

Another aspect taken into consideration in previous studies is the sector of activity. Elayan et al. (1998) argues that announcements made by firms from sector services in general and the financial sector in particular, generate a more negative stock market response because in these sectors the workforce is more valuable than in manufacturing sector, which relies mostly on physical assets.

H6: *The stock market reaction is more negative (less positive) for announcements in the service sectors than in the manufacturing sectors.*

B. Firms' characteristics

The stock price response to layoff announcements can be also determined by the level of firm's profitability. In fact, the sign of market reaction will depend on the perception of investors concerning layoff decision: we can expect a negative reaction when layoffs can be perceived as a confirmation of financial difficulties or in the case of a downward revision of growth opportunities and a positive reaction in the case of an expected growth in efficiency (Lin and Rozef, 1993). Accordingly, Chang and Hoffmeister (2002) found negative reaction in the case of firms with either negative ROA or positive and high ROA, and positive reaction in the case of firms with positive but low ROA. Another interpretation of the relationship between prior performance and stock market reaction is presented by Franz, Crawford and Dwyer (1999). Using the theory developed by Lindsley, Brass and Thomas (1995) they consider that companies with poor financial conditions (financial distress) can be viewed as being part of a downward spiral

and, in this case, a layoff announcement can be perceived by the market as a necessary action for stopping the spiral: the market reaction will be positive. In the case of companies with good financial performance, a layoff announcement can be interpreted as a negative signal (the beginning of the spiral) and the market will react correspondingly.

***H7:** The stock market reaction will be more favorable in the case of a firm that reveals future efficiency growth.*

Along with prior performance of the firm, another factor describing the firm characteristic is the firm size, which can be proxied by the market value of equity. Palmon *et al.* (1997) consider that firm size influence the informational content of announcements, being positively correlated with abnormal return in the case of announcements that cited adverse market conditions. The same significant positive relationship was found by Chang and Hoffmeister (2002). By contrast, Collett (2002) in the context of UK layoff announcements, found no relationship between firm size and stock market reaction.

***H8:** The stock market reaction to layoff announcements will be positively correlated with firm size.*

C. Characteristics of restructuring countries

The causes and the occurrence of layoffs depend also on business cycle. The contraction periods are assumed to be accompanied by demand decrease and poor firms' performance, revealing a more negative stock market reaction than in a period of expansion (Elayan *et al.*, 1998). But we can assume that firms laying off employees during an expansion phase are dealing with efficiency problems despite favorable economic context. In this case the information revealed by an announcement generates a higher market reaction. Using a sample of 231 US corporate announcements for the period 1981-1992, Chatrath *et al.* (1995) show that the significant negative reaction during the recession period in the early 1980s, became positive during 1991-1992 period, revealing important structural changes in labor market and in investors' perception.

H9: *The investors' perception regarding the layoffs decisions will change during unfavorable economic context (recession, in particular).*

In order to explain the differences in reaction depending on the level of development of the country concerned by the downsizing measures we take into consideration the informational content of the announcement. Thus, for the Central and Eastern European countries, which are characterized by a continuous process of restructuring, the informational content of layoff announcements is likely to be low. This will be not the case for developed countries where mass-layoff decisions are perceived more like an unexpected event. Also, we can expect a different stock market reaction depending on the fact that the restructuring case occurred in the same country where the stock is listed. Considering the elements stated above we can formulate the following two hypotheses:

H10: *The stock market reaction is negatively correlated with the level of development of the country concerned by layoff decision.*

H11: *The stock price reaction will be higher if the company is listed on the stock market of the country concerned by layoff decision.*

The multi-country dimension of the database also allows us to test a potential different reaction depending on the level of stock market development. In a comparative study of market reaction in the case of multiple layoffs announcements for US and Japanese firms, Lee (1997) found different result for the two markets: the US investors react less negative in the case of multiples announcements unlike Japanese investors. So, taking into consideration the specificity of the database, we can formulate the following hypothesis:

H12: *The layoff announcement concerning firms listed in anglo-american stock markets generate a low stock price reaction.*

D. Labor market characteristics

The effects of employment protection legislation (EPL) on labor market are mixed. The increase in job security as a result of EPL is an incentive for workers to increase human capital

investments with positive effects on productivity (Belot *et al.*, 2002). However, there is a large body of literature that emphasize that a more stringent legislation reduce turnover, a higher cost in labor adjustment reducing both hiring and firing. Moreover, as firing restrictions reduce job reallocation this could negatively impact productivity (Autor *et al.*, 2007; Bassanini *et al.*, 2009) especially for sectors that are subjective to structural changes (Cingano *et al.*, 2010). Messina and Vallanti (2007) go further in exploring the pattern of job turnover, showing that the impact of firing restriction on job creation and job destruction depends on whether the sector is a declining or a growing one. Given all these arguments, we can formulate the following hypothesis:

H13: *The stock market reaction will be more negative (less positive) when the layoff decision appears in a country with more stringent firing laws and concerns companies from declining sectors.*

Mass layoffs appear during recessions due to cyclical changes but also to structural changes which imply a reallocation of workers and capital between the industries. Even if a high level of job destruction generate negative effects at individual level like earnings loses or employment instability (Jacobson, Lalonde, and Sullivan 1993; Farber, 2003), it also bust productivity, as this restructuring process destroys low productivity jobs along with creating high productivity ones (Aghion and Howitt, 1994). Moreover, large firms consider recession periods as an opportunity to concentrate their reorganizational efforts, aiming for cost reduction and increasing efficiency programs. Considering these arguments, we can conclude that collective dismissals occurred in countries experiencing important firm or sector restructuring, might not be necessary a negative signal for investors. Thus, we can formulate the following hypothesis:

H14: *The stock price reveals a more positive (less negative) reaction when layoff cases occurs in a country with a high restructuring level.*

Another factor that could be taken into consideration is the labor cost. Firms react at a change in labor costs, by laying off employs in sectors where these costs are increasing, as a cost-efficiency measure, changing the mix of production inputs towards factors with lower marginal costs. In this case, the layoff announcement could be perceived as a way of increasing efficiency, and the stock market reaction should be positive.

H15: The stock market reaction will be less negative (more positive) when the layoff decision occurs after an increase in labor costs

3. Data on restructuring activities in Europe

3.1. The sample

The dataset that we collected is formed by two types of data: the information concerning the layoff announcements on one hand and the stock prices for the corresponding firms on the other hand. The data regarding the firms that announced layoffs were obtained from European Restructuring Monitor, which focus on restructuring activities in Europe and their consequences at the employment level. The database contains thousands of announcements of European restructuring, which are identified through a systematic press review of daily newspapers and business press. This information was merged with other company specific data available from Datastream. Datastream was also used to collect stock prices and stock market indices. The observation period ranged from January 2002 to December 2010. The available information for each firm related to layoff announcements is formed by:

- The announcement date: the date when the restructuring was announced for the first time in the press;
- The company name;
- The country: where the restructuring case took place: EU Members and Norway;
- The sector of activity: agriculture, fishing, mining and quarrying, construction, financial services, manufacturing, , real estate/business activities, retail, transport and communication, utilities, other services;
- The company's nationality;
- The type of restructuring: internal restructuring, bankruptcy, closure, merger/acquisition, offshoring/delocalisation , outsourcing, relocation;
- The reasons of disposals stated into announcement: reactive, proactive or no reason (using this delimitation presented above we can consider the demand slump, bad market or sector conditions, and bad financial results as reasons invoked for reactive measures and efficiency increase, cost reduction, development of new product or implementation of

new technologies as reasons invoked for proactive measures). In the case of an announcement that invoke both cost cutting and demand slump/financial distress causes we consider it as a reactive announcement;

- The market value of securities;
- The prior financial performance: return on assets over the previous year;

In the European Restructuring Monitor database the reasons invoked by the managers for downsizing are not directly specified. Therefore, for all the announcements selected for the study, we read the related articles and identified the reasons of layoffs.

After combining events data with company data, we identified a sample of 3,676 announcements. From this initial sample we excluded all the cases where there were other announcements occurred around the event date (for example, we excluded all announcements for which the type of restructuring is bankruptcy or merger/acquisition because they contain prior information concerning the eventuality of a redundancy decision). Also, because a large part of the sample is formed by companies that made multiple announcements, each time when two announcements occurred within four months of one another, the second announcement was dropped from the sample (in order to avoid an overlap). From the remaining sample we eliminate the announcements for which the stock price was not available for the estimation period and also firms which are not sufficiently traded (see *infra*). Taking into consideration all these aspects the final sample consists of 1,605 announcements for 677 listed firms (see Appendix 1 for the distribution of restructuring cases depending on the firm nationality).

In addition, the variables dataset was completed with series of indicators describing the macroeconomic environment (real GDP growth rate and GDP per inhabitant provided by Eurostat) or labor market dynamics (employment rate, employment protection indicator and labor unit cost provided by OECD; long term unemployment rate provided by Eurostat).

3.2. Stylized facts about restructuring and mass layoffs in Europe

Collective dismissals imposed themselves during '80 as a strategic decision aiming to increase the efficiency of the companies. At the beginning, this practice concerned mainly firms from manufacturing sector, affecting blue collar workers. However, in the last decade we can identify an important extension of this phenomenon to other sectors (service providing sectors), concerning also white collar workers. Firm restructuring process in Europe has manifested in the

light of these developments, showing a general trend generated by a global economic and financial context, but also specific characteristics at country level (see Appendix 2 for a global image of some key variables directly linked to the restructuring process in Europe).

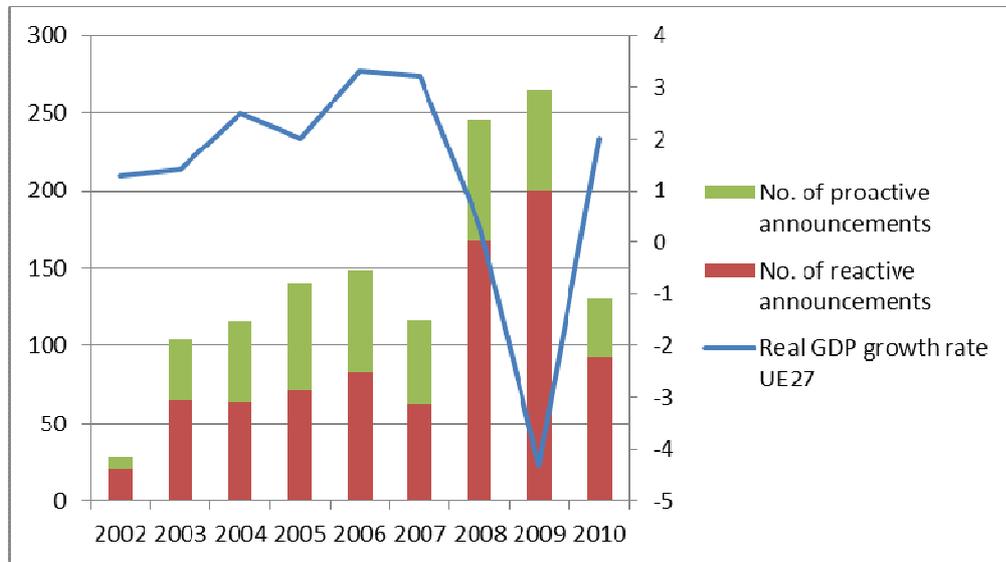
Table 1 reports the distribution of our dataset of layoff announcements. Panel A presents a classification of layoff announcements by sectors, the most representative sector being manufacturing, followed by financial services and real estate/business activities. In Panel B, we provide a distribution of layoff announcements over the period 2002-2010. As expected, there is an increase in frequency for 2008 and 2009, as a consequence of the financial crisis.

Table 1. Distribution of layoff announcements

Panel A: over sectors		Panel B: over the sample period	
<i>Sector</i>	<i>#</i>	<i>Year</i>	<i>#</i>
Construction	27	2002	82
Financial services	180	2003	143
Manufacturing	1,038	2004	138
Real estate & business	100	2005	167
Retail	62	2006	177
Transport & Com.	144	2007	137
Utilities	20	2008	277
Agriculture, etc.	14	2009	329
Other services	20	2010	155
Total	1,605		1,605

An interesting aspect of the reasons stated into layoff announcements is their distribution over the period. We can see from Figure 1 that the number of reactive announcements follows the evolution of the proactive ones in the first period, and then increased significantly after the first effects of crisis started to show. So, the evolution of causes behind the layoff decision (as the evolution of frequency of layoffs by year) follows very closely a global business cycle.

Figure 1: Reasons of layoff announcements and business cycle



4. Methodology

4.1. A large event study

To examine the stock price reaction to layoff announcements we used event study methodology. This methodology relies on the efficient market hypothesis (EMH) which asserts that stock prices fully and immediately reflect all available information which may influence the future profitability of a firm. The event study methodology is widely and continuously used in the economics and finance literature to assess how financial markets react to news of any kind. In order to address the problem of non-trading days we calculate trade to trade returns (Maynes and Rumsey, 1993). As usual, the market model is applied to describe the behavior of the stocks return and to separate the changes in the value caused by overall market effects from those changes caused by the downsizing announcement. The “normal” relation between the observed return of a given stock i at time t , $R_{i,t}$, and the market return at the same time, $R_{m,t}$, is given by:

$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$, where $\beta_i R_{m,t}$ is the proportion of the return of security i that is due to market wide factors, the parameter α_i measures the part of a average daily return on the stock that is not due to market movements, and $\varepsilon_{i,t}$ measures the part of the change in the value of firm’s i stock on day t that is not due to either movements in the market or to the firm’s average daily return. In the day of a event (here the layoff announcement), the deviation in an individual

stock's daily return from what is expected based on the previous equation, that is, the prediction error, is taken as an unbiased estimate of the financial effects of the event. Let $AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t}$ stand for this abnormal return or prediction error where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are respectively, the estimates of α_i and β_i .¹ Abnormal returns are computed given the market model parameters estimated with OLS through the period [-60; -20] in event time.² In order to be included in the dataset a stock must be traded at least 10 days during the estimation window. Event time is days relative to the layoff announcement date. To identify the impact of layoff announcement we took into consideration a three-days window surrounding the announcement date. For each of the firms in the sample the date 0 is the date the layoff announcement appeared in the journals. For the announcements which appeared on Saturday or Sunday we considered the next Monday as event date. Because the sample is formed by firms with different level of liquidity we consider all the stock that traded at least ones in the event window.³ The cumulative abnormal returns (CAR) are: $CAR_i = \sum_{-1}^1 AR_{it}$. To calculate the cumulative average abnormal return (CAAR) for all companies treated as a group we regress the cumulative abnormal returns at the firm's level over a constant: the p-value of the constant from these regressions (with robust standard errors) gives us the significance of cumulative average abnormal return.

In order to check for the significance of stock market reaction we also compute a nonparametric test, the generalized sign test (Cowan, 1992). The null hypothesis of this test is that the fraction of positive abnormal returns in an event day (window) is equal with that observed in the estimation window. Following Cowan (1992) the test statistic will be express as:

$$Z = \frac{p_+ - N\hat{p}}{[N\hat{p}(1 + \hat{p})]^{1/2}}$$

¹ In order to improve the quality of our estimations, we keep only the stocks for which $\hat{\beta}$ is statistically significant.

² We chose this interval because in the 2007-2010 period, many companies announced mass layoff at short intervals; using an extended estimation window would be determined an overlap with other announcements.

³ The conclusions remain unchanged if we consider only the stock traded in all days in the event window.

Where p_+ is the number of stocks with positive cumulative abnormal returns in the event

window, and $\hat{p} = \frac{1}{N} \sum_{i=1}^N \frac{1}{M_i} \sum_{t=-60}^{-20} S_{it}$, where M_i represents the number of non-missing returns in the

estimation period for couple security-event i and $S_{it} = \begin{cases} 1 & \text{if } AR_{it} > 0 \\ 0 & \text{otherwise} \end{cases}$

4.2. The multivariate analysis

In order to identify jointly effects of layoffs characteristics we report results from multiple regression analysis. For this, we consider a range of determinants referring to: firm (announcement) specific characteristics, global economic context and market condition and country specific characteristics. Appendix 3 reports some descriptive statistics.

The first model to be tested takes into consideration specific characteristics of each layoff decision, regarding the reasons laying behind layoff decisions, the type of restructuring, the sequence of announcements and the sector of activity:

$$CAR_i = \alpha + \beta_1 \text{Reactive} + \beta_2 \text{Proactive} + \beta_3 \text{First_announcement} + \beta_4 \text{Offshoring} + \beta_5 \text{Plant_Closure} + \beta_6 \text{Service} + \varepsilon_i \quad (1)$$

Where:

- CAR_i : Cumulative abnormal return for announcement i ;
- $Reactive=1$ for reactive announcements and 0 otherwise;
- $Proactive=1$ for proactive announcements and 0 otherwise;
- $First_announcement=1$ for firms announcing a layoff plan for the first time, and 0 otherwise;
- $Offshoring=1$ if the type of restructuring is offshoring and 0 otherwise;
- $Plant_Closure=1$ if the layoff announcement involves a site closure, and 0 otherwise;
- $Service=1$ if firm announcing a layoff measure activates in service industries (financial services, health & social work, hotels & restaurants, real estate & business activities, retail, transport & communication, utilities, other services) and 0 for goods-producing industries (manufacturing, agriculture/fishing, construction, mining/quarrying).

The second model improves the first analysis by the introduction of two supplementary variables characterizing the financial performance, also controlling for the companies' size. In a general manner, the first two models allow us to verify, in a global context, some research questions identified in previous studies.

$$CAR_i = \alpha + \beta_1 \textit{Reactive} + \beta_2 \textit{Proactive} + \beta_3 \textit{First_announcement} + \beta_4 \textit{Offshoring} + \beta_5 \textit{Plant_Closure} + \beta_6 \textit{Service} + \beta_7 \textit{ROA} + \beta_8 \textit{Firm_size} + \varepsilon_i \quad (2)$$

Where:

- *ROA*: the Return on Assets for the previous year;
- *Firm_size*: the logarithm of market value;

The multi-country dimension of the dataset is explored starting with the third model. Thus, in order to identify if the economic context has an impact on investors' perception, we add the real GDP growth rate variables, to control for business cycle. The inclusion of GDP per inhabitant (as a proxy for country development) allows us to search support for H10, of a potentially different pattern of restructuring process in different European countries. Moreover, as the dataset includes announcements of European restructuring cases made by companies with different nationality, we are also interested in detecting a link between the proximity of layoff effects and the stock market where the company is listed. Finally, as there is a lot of empirical research for US (or Anglo-American) stock market reaction to layoff announcements, but less empirical evidence for other stock markets (in particular for European stock markets), the last variable of the third model is designed to identify the investors behavior on different stock markets.

$$CAR_i = \alpha + \beta_1 \textit{Reactive} + \beta_2 \textit{Proactive} + \beta_3 \textit{First_announcement} + \beta_4 \textit{Offshoring} + \beta_5 \textit{Plant_Closure} + \beta_6 \textit{Service} + \beta_7 \textit{ROA} + \beta_8 \textit{Firm_size} + \beta_9 \textit{Growth} + \beta_{10} \textit{Country_development} + \beta_{11} \textit{Nat=Country} + \beta_{12} \textit{Anglo-American} + \varepsilon_i \quad (3)$$

where:

- *Growth*: real GDP growth rate
- *Country_development*: the logarithm of GDP per capita

- $D(nat=country)=1$ when there is a concordance between the country concerned by the restructuring decision and the nationality of the company;
- $D(Anglo-American)=1$ for Anglo-American firms, and 0 otherwise;

As it was emphasize before stock market reaction could also be determined by some specific labor market characteristics.⁴ In countries with high employment protection, where firing workers is costly for the firms, a mass layoff announcement may be the signal for an important restructuring effort undertaken by these companies. The employment protection indicator is included in the model in order to identify investors' perception regarding this aspect.

$$CAR_i = \alpha + \beta_1 DecSector*EmpPro + \varepsilon_i \quad (4)$$

Where:

- $DecSector*EmpPro$: is an interactional variable between declining sectors and employment protection legislation. Declining sectors dummy takes value of 1 if the company is part of a declining sector and 0 otherwise. We consider a declining sector when the sector's employment growth rate is under the economy's employment growth rate and a growing sector when the sector's employment growth rate is above the economy's employment growth rate.

As it was documented before mass layoffs are the results of structural adjustments occurred in the economy. Thus, layoffs associated with long lasting declining sectors concern, in general, workers with knowledge and skills specific to their job or industry, which may remain unemployed for a longer period of time. Moreover, in many European countries, collective dismissals are accompanied by compensations for employees affected by these decisions. These compensations could also act as a reduction in incentives to search for a new job, increasing the duration of unemployment. Considering all these arguments, we used the long term unemployment rate as a proxy for the level of country' restructuring. In addition, the model also includes a variable for the labor cost trying to capture the sectorial environment of restructuring companies.

⁴ We chose to test separately the labour market indicators because of the limited availability for employment protection indicator (the last available information stops in 2008).

$$CAR_i = \alpha + \beta_1 LTunemp + \beta_2 Laborcost + \varepsilon_i \quad (5)$$

Where:

- *LTunemp* : long term unemployment rate
- *Laborcost*: unit labor cost computed as the average cost of labor per unit of output (percentage change from previous quarter – sectorial level)

The last model includes all the statistically significant determinants of the stock market reaction to layoff announcements (because of the time availability of employment protection indicator this model concerns the 2002-2008 period).

Taking into consideration the elements presented before Table 2 summarizes the testable hypotheses.

Table 2. Determinants of cumulative abnormal returns and testable hypotheses:

Variables	Predicted sign
Reactive	<0
Proactive	>0
First announcement dummy	<0
Offshoring dummy	>0
Closure dummy	<0
Service dummy	<0
ROA	?
Firm size	<0
Real GDP growth rate	?
Country development	<0
Nationality=Country dummy	<0
Anglo-American dummy	>0
DecSector*EmpPro	<0
LTunemp	>0
Laborcost	>0

5. The results

Univariate analysis

Even if downsizing measures tend to improve firms' conditions through the cost reduction effect, the stock market reaction can be negative or positive depending on the investors' perception regarding the future performance of the company. Thus, in order to explain the sign

and the magnitude of this reaction we need to identify the factors taken into consideration by an investor in the case of a mass layoff. The prior literature on stock market reaction to layoff announcements develops a few aspects like: the reasons stated into announcement, the prior performance of the firms, the economic conjuncture, and other characteristics directly related to layoff announcement (the size of layoff, the number of layoffs per firm, the sector of activity etc). So we intend to verify a set of hypotheses directly linked to these aspects presented in prior research, but also to extend our analysis by considering the particularities of the database.

Table 3 presents the results for the overall stock market reaction to layoff announcements, and also some changes in this reaction that depend on the most relevant characteristics cited in the literature. As we can see from the Panel A, the reaction is negative (-0.177%) but not statistically significant, conclusion confirmed by both parametric and nonparametric test (so, we can reject H1). Also, the magnitude of stock price reaction is less than reported in other studies. However, taking into consideration that the time period used in this study is different from other studies, and considering the findings of Farber and Hallock (2009) who showed that the stock market reaction to layoff announcements has changed over time, becoming less negative, the results are not surprising. Starting with Panel B we identify the potential causes of this divided reaction (as stated before, a priori, stock markets may reveal both positive and negative reaction in a case of a layoff announcement). In Panel B, we provide the results for the reasons stated into announcements. The firms citing reactive reasons experience a significant negative CAAR (-0.883%), in contrast to firms who claimed that the reasons behind the layoffs were an increase in efficiency (in this case the stock market reaction was a significant 0.782%). In order to identify the statistical significance of the differences between cumulative abnormal returns for the two types of announcements a mean comparison test was effectuated. The result confirms a more negative reaction in the case of reactive announcements. These findings allow us to accept both H2a and H2b.

As the dataset contains announcements that occurred in two different economic context, we were able to analyze the changes in investors perception during the financial crisis. The results in Panel C show that the reaction, although not statistically significant, became less negative for the entire sample (less negative for the reactive announcements and more positive for the proactive ones).

Table 3. Cumulative average abnormal returns following layoff announcements

This table reports cumulative average abnormal return (CAAR) for a three days event window surrounding the announcement date. Time $t=0$ is considered the event date. Abnormal returns are computed given the market model parameters, which are estimated with OLS through the period $[-60; -20]$. $CAR_i < 0$ in the percentage of firms i with a negative CAR_i

	CAAR%	t-stat	Generalized Sign Test stat	N	CAR<0	Difference	t-stat
Panel A							
Overall reaction	-0.177	-1.46	-0.45	1,605	51%		
<i>Panel B</i>							
<i>Reaction by reason stated</i>							
Reactive	-0.883	-4.79 ***	-4.90***	827	59%	-1.665	-5.99***
Proactive	0.782	4.47 ***	4.74***	470	40%		
No reason	0.250	0.91	1.14	308	47%		
<i>Panel C</i>							
<i>Reaction by time period</i>							
Before crisis overall reaction	-0.277	-1.67*	-0.66	707	52%	-0.176	-0.72
After crisis overall reaction	-0.099	-0.57	-0.01	898	51%		
Before crisis reactive	-0.985	-3.40 ***	-3.15***	304	58%	-0.161	-0.42
After crisis reactive	-0.824	-3.46 ***	-3.76***	523	59%		
Before crisis proactive	0.541	2.24 **	2.41**	235	44%	-0.483	-1.38
After crisis proactive	1.024	4.05 ***	4.28***	235	37%		
<i>Panel D</i>							
<i>Reaction by financial performance</i>							
ROA<0	-0.671	-1.94 *	-1.05	241	55%	-0.592	-1.77*
ROA>0	-0.079	-0.62	-0.13	1,342	51%		

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

There are some possible explanations for these findings. The 2002-2007 period was characterized by a general good economic conjuncture and, in this case, a layoff announcement incorporates more new information, generating a higher stock market reaction. Starting with 2007 a lot of companies were suffering from financial difficulties and the reorganization actions did not come as a surprise for the investors. This explains the less negative stock price reaction. Second, the frequency of layoff announcement increased in the last period, the restructuring firms being constrained to implement successive mass layoff measures, which implies once again a decrease in the informational content of the announcement.

The last univariate regression takes into consideration the stock market reaction depending on the prior financial performance of the firms. The results from Panel D reveal that investors perceive a poor prior financial performance as a signal of a financial distress period for the firm and react correspondingly, the CAAR being -0.664% for a three days event window (the results must be interpreted with caution, since the generalized sign test is not significant in this case).

Multivariate analysis

The results of multivariate analysis are presented in Table 4. We first start with a series of announcement characteristics. As the univariate analysis predicted the stock market reaction depends primarily on the reasons stated into announcement, the coefficient for reactive dummy being negative and statistically significant (and positive and marginally significant for proactive dummy). The same result is identified in the case of initial dummy (as stated in H3). The results also show that dummy variable for plant closing has a marginally significant positive impact on stock price reaction, which means that this type of restructuring is no longer seen as a reactive measure. The offshoring variable has no impact on CARs, probably because the investors are waiting to see if the effects of this measure are beneficial for the company. Also, as previous analysis showed the sector of activity cannot be considered a good determinant for stock market reaction. So we have to reject all other hypotheses referring to layoff characteristics (H4, H5, H6).

The second model, in addition to the first one, introduces a variable for prior firm's performance (ROA), also controlling for the firm's size. Financial performance and firm size

variables were found as an insignificant predictor in the equation, leading to the rejection of H7 and H8.

The third equation goes further and takes into consideration the multi-country dimension of our database. The results suggest that the economic climate influences negatively the stock market reaction (the coefficient is statistically significant at 5% level, giving support for H9). These results could be explained by the fact that in an expansionary period the occurrence of a mass layoff gives a negative signal to the market, the firm being perceived by the investors as struggling despite the favorable climate. On the contrary, the level of development fails to predict the stock market reaction, leading to the rejection of H10. Moreover, the stock market reaction is influenced neither by the type of stock market, nor by the fact that layoff decision occurred in the same country where the stock is traded (so, we find no support for H11 and H12).

Starting with the fourth model we examine the impact of labor market variables on stock price changes. The negative value associated with the employment protection variable reveals that firms dismissing workers in declining sectors and in an environment where firing is costly give a negative signal to investors (thus, we accept H13). In addition, we find support for H14 of a different market reaction depending on the country restructuring level reflected by the long term unemployment rate. We also find that CARs are higher when the layoff decision is supported by an increase in labor cost, as predicted by H15.

The last model, which tests the impact of layoffs determinants found significant in previous analyses over the period 2002-2008, confirms the main findings presented above (the only exception being GDP growth rate variable).

6. Concluding remarks

Layoff decision can be associated with both positive and negative stock market reaction. The perception of investors is determined by the information incorporated in the announcement itself and in firm specific characteristics, but also by economic conjuncture.

Our analysis uses a dataset of 1,605 announcements of restructuring cases occurred in different European countries, over the period 2002-2010. The results reveal that the overall stock market reaction to layoff announcements is negative, but insignificant. Still, as the prior literature suggested, there are some layoff characteristics that can explain a potential positive or negative reaction. A significant determinant is the reason stated in the announcement. Thus, we find a

statistically significant negative reaction for reactive announcements and a statistically significant positive reaction for proactive announcements, so the cited reasons can be considered as relevant proxies for the investors' perception concerning the future profitability of a company. We also find a negative impact on the stock market in the case of the first announcement made by a firm. In addition, the analysis reveals a change in perception regarding plant closing announcements generating a positive impact on stock markets.

Another important result is that the reaction changes depending on economic context. Normally, in the case of an economic slowdown, the perception of investors tends to be negative no matter what the reason of layoff. However, our results show that the stock market reaction tended to be less negative (more positive) during the years with negative growth rate. We can explain these findings by the fact that after the first period of contraction the market incorporates the new information regarding the general economic context, so the decision of laying off workers can be viewed as a way of improving future efficiency.

Which differentiate this article from previous similar studies is the multi-country dimension of the dataset allowing to analyze the stock market reaction to layoff announcements in a global context. Moreover, as mass layoff decisions are, on one hand the result of a managerial (strategic) decision at firm level and, on the other hand, the result of a structural change at sectorial level, this article contribute to the literature by including in the analysis three variables characterizing labor market environment. Therefore, an increase in firing restriction applied in the context of declining sectors gives a negative signal to investors. On the other hand, countries with high levels of long-term unemployment, revealing an important restructuring process, convey less information through layoff measures reducing the negative impact on stock prices. Also, CARs are higher when the collective dismissals are the result of labor cost increases. Other variables like prior company performance, firm size, sector of activity or type of stock market do not have a statistically significant impact on stock price reaction.

Table 5. Determinants of cumulative average abnormal returns

This table reports the results from OLS regressions. The dependent variable is cumulative abnormal return (CAR) for a three days event window surrounding the announcement date ($t = 0$). Abnormal returns are computed given the market model parameters, which are estimated with OLS through the period [-60; -20]. Robust standard errors are reported below the coefficients. The sample contains 1,605 layoff announcements for the period 2002-2010. (D) denotes dummy variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.372 (0.312)	0.212 (1.250)	7.88 (5.391)	0.030 (0.268)	-0.619 (0.213)***	0.093 (0.478)
Reactive (D)	-1.088*** (0.327)	-1.001*** (0.330)	-0.992*** (0.331)			-0.890** (0.380)
Proactive (D)	0.618* (0.328)	0.627* (0.332)	0.695** (0.330)			0.812** (0.366)
First announcement (D)	-0.466* (0.253)	-0.403 (0.250)	-0.443* (0.255)			-0.939*** (0.314)
Offshoring (D)	0.165 (0.348)	0.119 (0.351)	0.166 (0.361)			
Plant closure (D)	0.562** (0.281)	0.560** (0.280)	0.596** (0.287)			0.928*** (0.330)
Service (D)	-0.267 (0.257)	-0.282 (0.247)	-0.341 (0.245)			
ROA (D)		-0.490 (0.375)	-0.475 (0.380)			
Firm size (market cap. in log)		0.012 (0.069)	0.044 (0.076)			
Real GDP growth rate			-0.097** (0.041)			-0.042 (0.089)
Country development			-0.812 (0.545)			
Nat=Country (D)			0.110 (0.264)			
Anglo-American (D)			0.269 (0.265)			
Labor institutions				-0.195* (0.107)		-0.230** (0.108)
Unit labor cost					0.023* (0.013)	0.028 (0.018)
Long-term unemployment					0.142 (0.056)	0.162*** (0.065)
Adj. R ²	0.028	0.029	0.034	0.002	0.004	0.049
No. of obs.	1,605	1,570	1,570	1101	1573	1084

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

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Appendix 1

Distribution of layoff announcements by restructuring countries and stock markets

Stock Market \ Restructuring Country	CEE and Malta ^a	Western European Countries ^{b1}	Nordic Countries ^c	Southern European Countries ^d
CEE and Malta ^a	67	0	0	0
Western European Countries ^{b2}	39	424	20	37
Nordic Countries ^c	15	31	200	6
Southern European Countries ^d	9	22	3	80
Anglo-American ^e	32	443	38	37
Other ^f	19	63	9	11

Note:

a. Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, Malta

b1. Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherland, Sweden, United Kingdom

b2. Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherland, Sweden, Switzerland

c. Denmark, Finland, Norway, Sweden

d. Greece, Italy, Portugal, Spain

e. Canada, US, United Kingdom

f. Australia, Brazil, Hong Kong, India, Israel, Japan, Mexico, South Africa, South Korea, Taiwan, Turkey

Appendix 2

Key indicators of restructuring countries

Country \ Indicator	No. of restructuring cases (2002-2010)	Real GDP growth rate (2002-2010)	GDP – PPS per inhabitant (2010)	Unemployment rate (2010)	Annual growth rate of unemployment	Unit labor cost Real average growth rate 2002-2010	Difficulty of dismissal 2008
Austria	210	1.63%	30,800	4.4%	2.25%	-0.12%	3.75
Belgium	415	1.46%	29,000	8.3%	2.57%	0.16%	1.75
Bulgaria	133	4.06%	10,700	10.2%	-6.94%	-0.03%	-
Czech Republic	585	3.41%	19,400	7.3%	-1.01%	0.36%	2.75
Denmark	248	0.55%	31,000	7.5%	5.84%	0.30%	1.50
Estonia	109	3.21%	15,700	16.9%	3.31%	-0.32%	3.75
Finland	292	1.71%	28,100	8.4%	-0.88%	0.14%	2.75
France	1199	1.03%	26,300	9.8%	2.00%	0.17%	3
Germany	915	0.87%	28,800	7.1%	-1.17%	-0.34%	3.25
Greece	87	1.88%	21,900	12.6%	1.83%	0.12%	2.75
Hungary	327	1.78%	15,800	11.2%	7.79%	-0.22%	2.50
Ireland	470	2.12%	31,100	13.7%	14.98%	-0.35%	2
Italy	383	0.20%	24,600	8.4%	-0.76%	0.17%	3.25
Latvia	52	3.28%	13,000	18.7%	4.21%	0.45%	-
Lithuania	145	4.09%	14,000	17.8%	0.84%	2.45%	-
Luxembourg	18	2.74%	66,300	4.6%	10.32%	0.35%	3
Malta	33	1.86%	20,100	6.9%	-1.06%	-	-
Netherland	430	1.30%	32,500	4.5%	6.74%	0.08%	2.75
Norway	95	1.46%	44,200	3.5%	0.32%	0.85%	3.75
Poland	1464	4.18%	15,300	9.6%	-6.91%	-0.52%	1.75
Portugal	241	0.49%	19,600	12.0%	11.24%	-	3.75
Romania	498	3.92%	11,400	7.3%	1.12%	0.37%	-
Slovakia	421	4.93%	17,900	14.4%	-3.20%	0.17%	2.75
Slovenia	214	2.67%	20,700	7.3%	1.83%	0.21%	3.5
Spain	345	1.90%	24,500	20.1%	7.48%	-0.01%	2.25
Sweden	546	2.20%	30,300	8.4%	4.20%	-0.38%	4
United Kingdom	1856	1.52%	27,400	7.8%	5.06%	0.22%	1.25

Source: European Restructuring Monitor, OECD Stan Database, Eurostat, World Economic Outlook Database IMF

Appendix 3

Descriptive statistics for the layoffs sample

The sample consists in 1605 mass layoff announcements made by firms listed on different stock markets over the period 2002-2010.

	Obs.	Mean	St. Dev.	Min	Max
Layoffs' characteristics					
Reactive(D)	1605	0.515	0.499	0	1
Proactive(D)	1605	0.292	0.455	0	1
First(D)	1605	0.421	0.494	0	1
Offshoring(D)	1605	0.119	0.324	0	1
Closure (D)	1605	0.166	0.373	0	1
Service (D)	1605	0.327	0.469	0	1
Firms' characteristics					
ROA<0 (D)	1582	0.151	0.358	0	1
Firm size	1579	15.561	1.918	9.021	19.762
Restructuring countries' characteristics					
Real GDP growth rate	1605	0.780	3.338	-18	10.5
Development	1605	10.14	0.24	8.97	11.15
Nat=Country	1605	0.454	0.498	0	1
Anglo-American (D)	1605	0.342	0.474	0	1
Labor market characteristics					
Long-term unemployment	1605	2.671	1.754	0.3	11.8
Labor unit cost	1573	0.959	9.829	-52.27	128.21
Labor protection	1101	2.10	1.30	0	4.5

Note: see the text for definitions and more details about the variables