

Workforce reduction and firm performance: evidence from french firm data (1994–2000)

Bénédicte Reynaud*

Centre of National Scientific Research (CNRS), Paris School of Economics (PSE), Ecole nationale supérieure, 48 bd Jourdan, 75014, Paris, France

*Correspondence: benedicte.reynaud@ens.fr

Using a large annual database of French firms (1994–2000), this article examines the determinants of workforce reductions in publicly listed and non-listed companies and their consequences on firm performance. First, workforce reduction appears to be a defensive response to adverse economic shocks. However, publicly listed firms anticipate better than do unlisted companies the decision to cut jobs. Second, a difference-in-differences model indicates that there has been a very small but significant improvement in the major performance indicators for the non-listed companies. For listed companies, the corresponding estimates are not significant.

Keywords: Workforce reduction, layoffs, financial performance, return on equity, selection bias

JEL classification: C14, D21, G14, J63, L25

1. Introduction

As global competition has increased and the economy has undergone major restructuring, downsizing has become an integral part of corporate strategy in developed countries. However, we still know relatively little about downsizing, with existing empirical results often being contradictory, and the notion itself only loosely defined. We provide new information that will help answer the question of whether firms improve their economic performance after downsizing. We show that the answer to this question depends on whether the firm is publicly listed or not, as well as the time horizon over which performance is measured. In particular, a reduction in employment can have very different effects in the short and long run. Our retained meaning of performance is economic rather than stock market-based, being constructed using a series of firm bookkeeping indicators.

The literature on downsizing usually makes the distinction between two different types: the first is defensive and constitutes a response to poor financial and economic results; the second is offensive and intends to improve the firm's financial performance. We aim to test this distinction here and show that downsizing is defensive for both listed and non-listed companies. We then attempt to measure the impact of workforce reductions on firm performance. Contrary to the results in some of the existing literature, workforce downsizing leads to a very small but significant improvement in performance for non-listed companies.

The remainder of the article is organised as follows. Section 2 presents a review of the related literature. Section 3 describes the research method—the database we construct, and the econometric strategy adopted. Section 4 analyses the determinants of workforce reductions in 1996, the reference year chosen for this research. Section 5 is devoted to estimating the impact of workforce reductions using a corrected difference-in-differences approach. Some concluding remarks are offered in Section 6.

2. Literature review

In a seminal article, [Cascio \(1993\)](#) carried out a critical review of the latest academic findings on the issue of why companies adopt downsizing programmes and set out a research agenda for the future. Following this work, a considerable number of contributions have tried to establish a conceptual and empirical understanding of organizational downsizing.

'Organizational downsizing' became a management catchphrase in the 1990s, which subsequently became known as the 'downsizing decade' ([Dolan et al., 2000](#)). Though downsizing has become an increasingly common practice, it still has no precise theoretical formulation ([Thornhill and Saunders, 1998](#)). Downsizing has a multiplicity of meanings. Managerial publications, in which many of the terms associated with downsizing are euphemistic, gives a more positive spin, using terms such as 'brightsizing', 'leaning up', and 'revitalizing'. Here downsizing appears simply as a miracle cure ([Downs, 1995](#)) that will improve a company's overall performance by increasing efficiency and productivity. The treatment here is simply defined as a reduction in the workforce, perhaps combined with the sale of non-performing plants or units. At the other end of the spectrum, a more psychological perspective analyses the negative effects on the remaining employees, finding higher levels of depression and health problems ([Moore et al., 2003](#)).

Between these two extremes, the economic literature has attempted to define existing forms of downsizing. Here two kinds of managerial policies are opposed in which the same symptomatic fall in organization size can be observed; however, the causes and effects are very different.

First, [Cameron *et al.* \(1993\)](#) clearly defined offensive downsizing in three parts: (1) an intentional plan whose (2) means is a reduction of the company's size, that is to say, either its workforce or its assets, and whose (3) purpose is mainly an increase in profitability. These features remain rather sketchy but may work as a common denominator. [Cameron \(1994\)](#) stressed the positive impact of downsizing 'designed to improve organizational efficiency, productivity, and/or competitiveness', whereas [Cascio \(1993\)](#) asserted that downsizing is essentially a purposive strategy defined as the eradication of the workforce by 'the planned eliminations of positions or jobs'.

On the contrary, defensive downsizing may signal an effort by management to stymie or reduce the extent of a decline in profitability. Layoffs are thus driven by changes in the product market and product demand and constitute a traditional strategy to avoid bankruptcy. This policy is essentially reactive. [Cappelli \(2000\)](#) accurately summed up these findings: the distinctiveness of offensive downsizing, as opposed to defensive downsizing, is that the job cuts do not necessarily appear to be driven by shortfalls in demand but are instead the consequence of a well-prepared management strategy.

According to the managerial literature, firms downsize for two opposing reasons, each of which has prevailed historically in different periods. First, downsizing in the 1980s was a common strategic response to save failing companies that were losing market share to foreign firms or suffering from large falls in demand for their products (Cameron and Whetten, 1987; [Freeman and Cameron, 1993](#)). However, the merger wave of the 1980s influenced the evaluation of firms and consequently downsizing strategy. Any company trading at a price-earnings multiple lower than the industry-wide level was viewed as being under-valued or a poor performer, and thus ripe for takeover. Moreover, shareholders considered that CEOs and executive management ought to serve their interests. These attitudes explain the change in the meaning of downsizing characterising a second period in the middle of the 1990s. Urged by financial markets to increase their return on equity, even though they already enjoyed considerable profits, large corporations embarked on internal restructuring, consisting in both reducing employment and taking financial action such as selling non-performing assets or focusing on core activities.

In another field, that of organisational theory, [Ahmadjian and Robinson \(2001\)](#) analyse the link between downsizing and the move away from permanent employment in Japan between 1990 and 1997 for a panel of 1638 listed firms. They show that at the same time downsizing became more widespread, the social and institutional constraints that had restricted its use loosened. Firms were encouraged to follow the lead of others in this respect. However, the main thrust of this article is not the evaluation of the impact of downsizing on firm economic and financial performance.

In this article we alternatively use the terms ‘workforce reduction’, ‘downsizing’, and ‘layoff’. This is because in France there is no institutional difference between layoff and downsizing, since a layoff implies permanent separation with workers.¹ Although we are aware of the subtleties of defining organisational downsizing, we adopt the notion commonly accepted in the field (Cascio, 1993; De Meuse *et al.*, 1994; Freeman and Cameron, 1993; DeWitt, 1998; Budros, 1999). Here downsizing is defined as an intentional policy involving a reduction in the workforce to improve the firm’s efficiency. As Cameron (1994, p. 194) points out, ‘downsizing may be reactive and defensive, or it may be proactive and anticipatory’.

Baumol *et al.* (2004, p. 5) emphasise the lack of empirical work on the effects of workforce reduction on firm performance. Moreover, the existing empirical work has led to ‘conflicting findings’ (Wayhan and Werner, 2000, pp. 343–344). Regarding the relationship between employee downsizing and firm profitability, two bodies of work are opposed. The first suggests that employee reductions lead to improved performance (Bruton *et al.*, 1996; Kang and Shivdasani, 1997; Palmon *et al.*, 1997; Chen *et al.*, 2001; Espahbodi *et al.*, 2000; Yu and Park, 2006). In particular, Cascio *et al.* (1997) find a number of positive relationships between employment reductions and financial performance. Interestingly, companies that combine employment downsizing with asset restructuring generate a higher return on assets. Albeit still scarce, research on French accounting data also tends to suggest positive outcomes from restructuring. In a sample of 90 large companies whose workforce was reduced by more than 10%, Sentis (1998) showed that indebtedness fell after a large workforce reduction. For d’Arcimoles and Fakhfakh (1997), layoffs are profitable because they affect not only the number in the workforce but also its structure. However, there are important statistical drawbacks to these previous estimates. The accounting standards used are not always satisfactory for the evaluation of the change in economic performance. For instance, we should ideally compute labour productivity per hour, not per capita, because the ratio of the yearly flow of output to the final lower stock of workers overestimates the change in labour productivity. The second body of work, including De Meuse *et al.* (1994, 2004), Cascio *et al.* (1997), Mishra and Spreitzer (1998), Suarez-Gonzalez (2001), and Guthrie and Datta (2008), finds that employee downsizing has a deleterious effect on firm profitability. It thus remains unclear whether downsizing improves economic performance. As a result, firms generally have only a hazy idea of the consequences of downsizing.

¹This is an important difference from the USA. In a layoff, the worker is asked to leave temporarily during periods of low demand, but will be asked back when business picks up. However as Cappelli (2000, p. 3) points out, layoffs are associated with shortfalls in demand, whereas downsizing consists of ‘reductions in jobs driven by the desire for operating efficiencies’.

De Meuse *et al.* (1994) consider the relationship between layoffs and five indicators of firm financial performance: the profit rate, return on total assets, return on equity, the asset turnover rate and Tobin's Q. The year of the downsizing announcement, if any, is 1989, and the sample consists of 52 firms amongst the *Fortune* 100 list of the largest American companies: 17 of these laid off workers in 1989 and the 35 others did not. The relationship between the layoff rate amongst those that reduced their workforce and the financial variables between 1988 and 1991 is estimated. The results are only rarely significant; when they are, they are negative, with layoffs being associated with a lower profit rate in 1989, and lower return on equity (ROE) and return on assets (ROA) two years later. The five performance indicators are then compared between the 17 layoff firms in 1989 and the 35 that did not layoff. The annual performance indicators are considered between the year before and the year after the layoffs. The results show that whatever the indicator considered, the gap between the performances of firms that laid off and the others continued to grow over the period under consideration, with the majority of the results being statistically significant. However, the number of observations here is fairly small, and the statistical analysis does not include any control variables.

The results in Cascio *et al.* (1997) are more nuanced than those in De Meuse *et al.* (1994). Their sample is the 500 companies in the Standard & Poor's index, whose employment decions are analysed over the 1981–1992 period. The final sample covers 537 firms. In total, 5479 changes in employment are identified, with 89% of firms having at least one employment change in one of the years considered. Firm financial information comes from the COMPUSTAT database. This is collected for the year of the workplace movement and for the two subsequent years. One interesting contribution of the work here is the consideration of asset movements: workforce reductions are indeed sometimes accompanied by transfers of assets, which can influence both subsequent economic and financial performance. Cascio *et al.* (1997) thus consider seven types of joint employment and asset decisions.² These decisions are related to profitability in the year of the movement and the two following years, controlling for industry. The economic

²Alongside *stable employers* (46.9% of decisions), where employment changes by less than 5%, the authors identify the following groups: *employment downsizers* (13.2% of decisions), where employment falls by more than 5% but assets fall by under 5%; *asset downsizers* (1.6%), where assets fall by at least 5% but employment by less than 5%; and *combination downsizers* (4.1%) who reduce both assets and employment by at least 5%. Symmetrically, with the same 5% threshold, there are *employment upsizers* (5.2%), *asset upsizers* (15.2%), and *combination upsizers* (13.8%). This taxonomy is, of course, arbitrary: the 5% threshold was retained because a lower threshold of 3% would have counted as downsizers firms that did not replace retiring workers. A threshold of 10% would have excluded some large firms for whom smaller percentage reductions nonetheless translated into considerable number of jobs lost.

climate is a key factor determining employment decisions: the initial economic situation of downsizers is generally unfavourable. The authors distinguish employment downsizers from asset downsizers and note that there is no improvement in profitability in the two years following layoffs, but there is on the contrary for asset downsizing. These results are in line with those in Worrell *et al.* (1991): workforce reductions are not positive on principle, but only when they are accompanied by restructuring measures with the transfer of assets.

Guthrie and Datta (1998) examine the moderating role of industry conditions on the downsizing–performance relationship and conclude that the negative effects of downsizing on organizational performance are more pronounced in industries characterised by high research and development (R&D) intensity, growth, and low capital intensity.

The current article adopts a complementary approach, focusing on statistical methods that have been hitherto underused. The choice of method may be one reason for the diversity of objective outcomes, and a number of statistical shortcomings undermine the reliability of the methods that have been considered to date. First, the samples in previous work are so limited in size (the largest uses the Standard and Poor's index) that few serious conclusions can be drawn. Second, to analyse the impact of downsizing on firm performance, some work has compared the average profitability growth of companies that reduced their workforce to that of firms that did not. This implicitly assumes that the consequences of a workforce reduction are not contingent on the initial characteristics of the firms that downsize. As such, they run the risk of serious selection bias. Third, most existing research covers large firms and does not draw the distinction between publicly listed and non-listed companies. We show that this latter distinction is key. If we assume that workforce-reduction policy lies in the domain of corporate governance and depends on the distribution of power between shareholders and stockholders, then the causes of workforce reduction and the resulting economic performance of listed and non-listed firms should be different. Another distinction rarely made in the work cited above is that of the temporal horizon, where the effects may differ over the short, medium, and long runs.

3. Research methods

3.1 Data and descriptive statistics

The empirical analysis is based on three data sets, providing labour, economic, and financial information on French companies over the 1994–2000 period. Note that these data are exhaustive and are believed to cover all companies in their sector, as it is compulsory for French firms to provide this information. The BRN (Bénéfices Réels Normaux) database provides extensive accounting and fiscal data on

operating profit, debt, and equity for any company with sales turnover above €530 000. More than 500 000 companies are included in the data set each year. The DADS (Déclarations Annuelles de Données Sociales) database yields information on labour structure (wages, gender, qualifications), and covers more than 80% of employees. Last, financial market data is provided by Euronext, for all listed companies that were quoted in at least one year between 1994 and 2000.

The DADS data set is at the plant level, from which we reconstitute the data at the firm level. Firms keep the same ID number, called the SIREN, throughout their economic life, allowing us to merge the BRN and DADS data and follow companies over the period under consideration. Finally, the Euronext data set tracks the traded securities of listed companies, with each stock registered under a unique ID code, called the Sicovam. We identify the firm represented by each traded security and link the Sicovam and SIREN identifiers. Whenever several securities are identified with the same firm, we keep only the most traded stock.

We further require that firms in our sample have a workforce of at least 20 employees in 1995. After filtering for outliers³ and eliminating certain sectors,⁴ the final sample, which we call the general set of companies has 62 798 observations. Note that each observation corresponds to a firm for which statistical information is available in at least one year between 1994 and 2000. We also analyse publicly listed companies in a separate database, called the listed-firms sub-sample. We include large French companies (whose stock prices are measured either spot or forward) and medium-sized companies with a good record in accounting practices and key financial figures (quoted on the secondary market).⁵ The final listed-firms sub-sample has 417 observations in our reference year (1996).

³We exclude observations corresponding to the first and last percentiles of the economic and financial ratios.

⁴Companies from particular sectors, such as agriculture, energy, real estate property, financial services, government, and associations, are not considered, as they do not fit either the purpose of this study or with traditional accounting analysis.

⁵The secondary market, created in 1983, covers the listings of small- and medium-sized companies. Share trading on this market is spot, and the entry conditions are less strict than those on the primary market. Companies that would like their shares to be quoted on the secondary market have to submit two years of certified accounts to the French Stock Exchange Commission (the Commission des Opérations de Bourse, COB). If they are accepted, they can issue shares for up to 10% of their capital. During the first three years of the company's listing, a specialised committee (the Conseil des bourses de valeurs, CBV) decides whether to maintain the company's shares on the market. After three years of listing on the secondary market, the company can request to be transferred to a listing on the primary market. Similar market structures exist in both the USA and the UK.

Because our aim is to analyse the effects of workforce reduction on performance for surviving companies, observed every year between 1994 and 2000, the final sample consists of 13 615 observations for non-listed companies and 222 observations for the others.

Our measure of the workforce is the average number of employees over the year.⁶ We thus avoid the significant accounting bias induced by measuring employment only at the end of the fiscal year. We focus on the change in the workforce between 1995 and 1996 to distinguish two groups of firms: employment downsizers and employment upsizers. Our employment variable includes both full-time and part-time workers. However, firms could have reclassified full-time positions as part-time ones, in which case our variable would fail to pick up a workforce reduction. We address this concern here: the share of part-time jobs in the workforce actually fell from 7.2% to 6.6% for employment upsizers, and from 7.3% to 6.5% for employment downsizers. A Tukey Studentised range test indicates that the difference between these two groups is not statistically significant at the 5% level. However, more generally firms may reduce hours of work instead of cutting the workforce, which would again bias our measure. We therefore look at the change in the average number of hours worked per worker between 1995 and 1996. Firms did not reduce hours instead of downsizing: on the contrary, in the case of listed companies the two policies were used at the same time. A total of 43.2% of firms report workforce reductions between 1995 and 1996. This figure is 43.1% for non-listed companies and 54.0% for listed companies. The intensity of the workforce reduction across the two sets of firms is another variable of interest. Taking into consideration only firms with workforce reductions, 52.4% of non-listed companies record reductions of over 5%, with a comparable figure for listed companies of 43.8%.

We include a certain number of firm variables as correlates of workforce reductions. The profitability ratios tell us whether a business is making a profit, and if so whether it is at an acceptable rate (the ROA and ROE: see Table 1 for the variable definitions). The operating ratios (profit margin, labour productivity, and labour cost) provide us with an insight into how efficiently the business is employing the resources invested in fixed assets and working capital. The liquidity ratios (debt rate, long-term debt pressure, and interest cover) indicate how capable a business is of meeting its short-term obligations as they become due. The investment ratio concentrates on the long-term health of a business.

In addition, we include financial market information for publicly listed companies, such as the change in stock price and the change in capitalization (computed over consecutive years). Stock prices have been adjusted to take into

⁶This is the arithmetic average of the total number of employees at the end of each quarter from the BRN. Note that the aggregate measure of employment we obtain does not record a displacement of employees between plants of the same firm as a decrease in workforce.

Table 1 Variables definition

$$ROA = \frac{\text{Net profit before tax interest and dividends (EBIT)}}{\text{Assets}}$$

$$ROE = \frac{(\text{Net profit before tax, interest and dividend (EBIT)} + \text{Financial result})}{(\text{Equity} + \text{Long-term debt})}$$

$$\text{Profit Margin} = \text{Pmarg} = \frac{\text{Net Profit before tax, interest and dividends (EBIT)}}{\text{Sales}}$$

$$\text{Labour Productivity : Lprod} = \frac{\text{Value Added}}{\text{Total hours worked}}$$

$$\text{Labour Cost : Lcost} = \frac{(\text{Wages} + \text{Social contributions})}{\text{Total hours worked}}$$

$$\text{Debt rate : Debt} = \frac{\text{Long-term debt}}{\text{Equity} + \text{Long-term debt}}$$

$$\text{Interest Cover : lcover} = \frac{\text{Interest}}{\text{Sales}}$$

$$\text{Investment effort : Effo} = \frac{\text{investments}}{\text{Fixed Assets}}$$

$$\text{Sales turnover : } \Delta\text{LCA} = \frac{\text{Log Sales 1995}}{\text{Log Sales 1994}}$$

$$\text{Long-term Pressure : LPRES} = \frac{\text{Long-term Debt} + \text{Medium-term Debt}}{\text{Total Debts}}$$

$$\text{Change in Assets : } \Delta \text{ Assets } (94 - 95) = \frac{\text{Log Fixed Assets 95}}{\text{Log Fixed Assets 94}}$$

$$H_i = \frac{\sum_i (\text{SALES}_k^i)^2}{\sum_i (\text{SALES}_k^i)^2}$$

The index takes on values between 1/Nk (where Nk is the number of

companies in activity k) and 1. We then compute an index of the average competitive pressure the firm faces for the market in which it is active, as the average of the sectoral indices H_k :

$$H^i = \frac{\sum \text{SALES}_k^i}{\text{SALES}^i} H_k \text{ where } \text{SALES}^i = \sum_k \text{SALES}_k^i$$

Qualification has four levels:

- Q0: percent of apprentices
- Q1: percent of unskilled labour
- Q2: percent of skilled labour
- Q3: percent of highly skilled labour

The group is a set of companies that have financial participation

account the change in the total number of shares.⁷ We also use information on the workforce: gender, qualifications (divided into four categories from the least- to the most-skilled), age (four categories), and the share of part-time workers in the

⁷The adjustment coefficient was provided by Euronext.

total workforce. Depending on their change in workforce in 1996, companies are then divided into employment downsizers and employment upsizers.

3.2 *Econometric strategy*

Our variable of interest is the economic performance resulting from downsizing. We proceed in two steps. The first step consists in estimating a logit model explaining the probability that a firm reduce its workforce, both for publicly listed and non-listed companies. The logit model allows us to characterise the nature of the workforce reduction. The second step estimates the specific effect of such a strategy on different performance indicators Y , using standard ordinary least squares (OLS),⁸ where the change in economic performance $Y_{it} - Y_{it0}$ is explained by the employment policy T and the set of variables X we included in the logistic estimate. We then eliminate insignificant variables iteratively, using a threshold of 10%, and report the coefficient on T whenever it is significant. This OLS estimation is equivalent to a controlled difference-in-differences estimator, which has not been applied in the work referred to previously. These estimates yield the impact of the employment policy on the gap between downsizing firms and the other firms for each variable of interest, rather than the level of these variables. We use two different starting points for our estimates, 1995 and 1996, and look for short- (1995–96), medium- (1996–97), and long-run (1996–2000) effects on performance. The short-term differences are used to assess the dip in economic performance around the time of the treatment; the medium- and long-term differences yield a gross measure of the treatment effect. Finally, the net change in economic performance can be approximated as a difference between the gross change and the dip. Note that these estimates show the impact of employment policy on the gap between downsizing firms and other firms for each variable of interest, rather than on the level of these performance variables.

So far our OLS estimates are based on firms for which data are available for all variables of interest in 1996, 1997, and 2000. One question arises about the meaning of missing data points, as it is a legal duty for the firms to submit the required information: among companies that were present in our full sample in 1995 with at least 20 employees, 5.89% are missing in 1997 and 13.41% in 2000.

We first test the logical relationship between disappearing from full sample, and the initial characteristics of companies. In Table 2, we present a logistic estimate on the share of firms that were missing in 1997 (first column) or in 2000 (second column). As expected, a greater probability of being missing is linked

⁸We have also used matching estimators, following the work of Rosenbaum and Rubin (1983); the propensity score of downsizing is then computed by the logistic estimates. The results are very similar to the OLS estimates, showing that we do not face a problem of heterogeneity or non-linearity. For a comparison of a number of evaluation methods, see Duflo (2002).

Table 2 Logistic estimate of the probability of missing companies

Exogenous variables	Prob of being missing in 1997	Prob of being missing in 2000
Intercept	0.168	1.145**
Workforce structure		
Size		
50–199 employee (95)	0.216**	0.112**
200–499 employee (95)	0.449**	—
Age		
% less than 25 years old (95) (A2)	2.279**	1.328**
% 35–50 years old (95) (A3)	2.986**	1.427**
% more than 50 years old (95) (A4)	2.516**	1.371**
Qualifications		
% of skilled workers (95) Q2	0.912**	0.332**
% of highly skilled workers (95) Q3	1.386**	0.583**
Share of part-time job (95) PT	0.964**	0.534**
Labour costs		
Change in hourly rate of unskilled workers (log) Δ LCHQ1 (95–94)	—	0.143**
Change in hourly rate of skilled workers (log) Δ LCHQ2 (95–94)	0.599**	—
Hourly rate of highly skilled workers (log) LCHQ3 (95–94)	–0.884**	–0.704
Change in hourly rate of highly skilled workers (log) Δ LCHQ3 (95–94)	–0.630**	—
Past performances		
<i>Profitability</i>		
Return on equity (ROE) 95	–0.750**	–0.486**
<i>Efficiency</i>		
Change in Pmarg (94–95) d1_ca_tmarge	–2.379**	–1.706**
Liquidity ratios		
Interest cover (ICOVER) (95) ca_inso	11.765**	10.353**
Debt rate DDRATE (95) cper_tendt	0.188**	0.128**
Long-term pressure (LPRES) 95 pdlt	–0.561**	–0.472**
Change in long-term pressure Δ LPRES (94–95)	0.775**	0.684**
<i>Sales turnover</i>		
Δ LCA (95)		
<i>Investment and assets</i>		
Investment effort (EFO) (94–95)	–0.485**	–0.265**
Change in assets (Δ Assets) (log) (94–95)	–0.474**	–0.294**
<i>Environmental variables</i>		
Listed on a stock market (LISTED)	n	–1.624**
Group (95)	0.316	0.451**
Percent of concordant	83.9%	70.2%

with the same mediocre financial performances as a greater probability of reducing employment: a low level of equity (ROE95 = –0.75 for 1997 and ROE = –0.486 for 2000), low profit margins (Pmarg94–95 = –2.379 for

1997 and $P_{marg94-95} = -1.706$ for 2000) and greater insolvency ($ICOVER = 11.765$ for 1997 and 10.353 for 2000). Poor profitability combined with a gloomy outlook has driven these firms into financial distress and bankruptcy. Another important finding stems from the role played by the group variable: firms belonging to a group are more likely to disappear from the data set ($Group_{95} = 0.451$ for 2000). This might indicate that firms have merged with some entities within the group. In this case, we cannot easily assess the bias that might be generated in our previous estimates, as these firms could be in either good or bad financial shape.

We need to take into account the problem of bankruptcy for missing firms that do not belong to a company group. Firms that reduced their employment are twice as likely to face bankruptcy, according to our data, and thus our previous OLS estimates based on surviving firms may be upward-biased. Therefore, for the three key profitability ratios (ROA, ROE, and profit margin) we estimate (Table 2) a lower bound for the impact of workforce reduction by including reconstructed data that were previously missing. That is, where some data are missing, we impute values that firms would have been likely to report had they survived. We then run the OLS estimates on the corrected data set. The results reassure us that these measurement concerns do not have a serious impact on our analysis. As the estimates below show (Section 5), there is still a positive net gain in ROA and profit margin between 1995 and 2000, although it is now lower (ROA = +1.02 points; Profit Margin = +0.02 points). Although the net change in ROE was previously insignificant, the corrected estimates show that the profitability gap is now worse in the long run, but only by 2.3 points.

4. The determinants of workforce reduction differ in listed and non-listed companies

We consider two specifications of the logit model (Tables 3 and 4). The first includes a complete set of firm characteristics, as well as information on workers and financial markets for the listed firms full-sample. Specifically, this specification includes firm size, different accounting data (profitability ratios, operating ratios, liquidity ratios, and investment ratios), labour characteristics (gender, qualification, age, and the share of part-time work in the firm), and sector dummies. However, a large number of control variables can generate biases. To tackle this problem, the second specification selects the more robust model, via a procedure consisting in dropping the least significant variables one after another, using a 10% significance threshold.

Table 3 Logistic estimate of the probability to reduce workforce

Exogenous variables	Full sample			Listed firms sub-sample		
	Model 1	Model 2	Mean	Model 1	Model 2	Mean
Intercept	-1.948	0.721		-1.238		
Workforce structure						
Size						
50–199 employees (95)	0.369**	0.386**		1.224	—	
200–499 employees (95)	0.570*	0.567 **		1.041	—	
More than 500 employees (95)	0.617**	0.611**		1.210	—	
Age						
% less than 25 years old (95) (A1)	0.115	—	0.33	-0.53	—	0.30
% 35–50 years old (95) (A3)	0.834**	0.814**	0.42	2.365	—	0.45
% more than 50 years old (95) A4	1.926**	1.925**	0.15	2.758	—	0.18
Gender						
% of female workers (95) S2	-0.038	—	0.28	0.709	—	0.37
Qualifications						
% of unskilled workers (95) Q0	1.836**	- 1.902**		0.837	—	
% of skilled workers (95) Q2	-0.072	—	0.42	0.267	—	0.37
% of highly skilled workers (95) Q3	-0.066	- 1.381*	0.24	-2.017	—	0.41
Share of part-time job (95) PT	0.389*	0.276*	0.07	4.292		0.06
ΔPT (95–94)	-0.197	—	0.01	-0.750		0.02
Labour costs						
Unskilled workers' wage (log) 95 (LCHQ1)	0.001	—	4.2	1.882**	1.239**	4.4
ΔLCHQ1 (95–94)	0.016	—		-0.754	—	
Skilled workers' wage (log) (LCHQ2) 95	0.174	0.170*	4.36	-0.048	—	4.51
ΔLCHQ2 (95–94)	-0.122	—		1.574	—	
Highly skilled workers' wage (log) LCHQ3 95	0.028	—	5.09	-1.721	- 1.764**	5.17
ΔLCHQ3 (95–94)	- 0.215*	- 0.221*		-0.595		
Past performances						
Profitability						

Continued

Table 3 Continued

Exogenous variables	Full sample			Listed firms sub-sample		
	Model 1	Model 2	Mean	Model 1	Model 2	Mean
Return on equity (ROE) 95	-0.562**	-0.585**	0.08	-4.610**	-3.482**	0.16
Δ ROE (95–94)	0.197*	0.173				
<i>Efficiency</i>						
Change in Pmarg (94–95)	-1.967*	-1.722*	-0.01	-3.976	—	-0.01
Change in labour productivity (Δ Lprod) (94–95)	0.295*	0.263*		0.683	—	
Liquidity ratios						
Interest cover (ICOVER) (95) ca_inso	2.107	5.758*	0.12	-1.022	—	0.19
Δ ICOVER (94–95)	3.948	—		-0.326	—	
Debt rate DDRATE (95)	0.038*	0.04*	0.07	0.783**	—	0.12
Δ DRATE (94–95)	-0.011	—		-0.714	—	
Long-term pressure (LPRES) 95 pdlt	-0.037	0.379*	0.15	1.036	—	0.18
Δ LPRES (94–95)	0.344	—		-2.043	—	
Sales turnover						
Δ LCA (95)	-0.997**	-0.993**		-0.106	—	
<i>Investment and assets</i>						
Change in Investment effort (Δ EFFO) (94–95)	0.052	—	0.06	1.296	—	0.09
Change in assets (Δ Assets) (94–95)	-0.762**	-0.746**	0.01	-2.95**	-1.603**	0.01
Competition						
Competitive Pressure (Hi) (95)	0.902*	0.935*	0.03	-0.066	—	0.07
Δ Hi (95)	0.002	—	0.15	-0.289	—	0.14
Percent of concordant	64.3%	64.3%		79.7%	67.8%	
Number of observations	13615	13615		222	222	

Notes: Standard errors appear in parentheses; ** p -value < 0.05; * p -value < 0.10; NS stands for not significant at the 10% level.

Table 4 Logistic estimation of the probability of workforce reduction listed firms sub-sample

Exogenous variables	Model 1	Model 2
Intercept	-2.584	2.189
Workforce structure		
Size		
50–199 employees (95)	1.444*	—
200–499 employees (95)	1.184	—
More than 500 employees (95)	1.410	—
Age		
% under 25 years old (95) (A1)	0.513	—
% 35–50 years old (95) (A3)	3.062	—
% over 50 years old (95) (A4)	1.993	—
Gender		
% female workers (95) S2	-0.101	—
Qualifications		
% Apprentices (95) Q0	2.370	—
% skilled workers (95) Q2	-0.725	—
% highly skilled workers (95) Q3	-2.687	-1.990*
Share of part-time jobs (95) PT	5.289	—
ΔPT (95–94)	-0.850	—
Labour costs		
Unskilled workers' wages (log) (LCHQ1) 95	1.999*	1.747*
ΔLCHQ1 (95–94)	0.831	—
Skilled workers' wages (log) (LCHQ2) 95	0.372	—
ΔLCHQ2 (95–94)	1.377	—
Highly skilled workers' wages (log) (LCHQ3) 95	-1.908	-1.597*
ΔLCHQ3 (95–94)	-0.032	—
Past performance		
<i>Profitability</i>		
Return on equity (ROE) 95	-4.960*	-4.714*
ΔROE (95–94)	0.520	—
<i>Efficiency</i>		
Change in Pmarg (94–95) d1_ca_tmarge	-3.903	—
Change in labour productivity (ΔLprod) (94–95)	0.869*	0.663*
Liquidity ratios		
Interest cover (ICOVER) (95) ca_inso	-1.043	—
ΔICOVER (94–95)	-0.368	—
Debt rate DDRATE (95) cper_tendt	0.841*	0.698*
ΔDRATE (94–95) d1_cper_tendt	-0.618	—
Long-term pressure (LPRES) 95 pdlt	1.117	—
ΔLPRES (94–95)	-1.931	—
<i>Sales turnover</i>		
ΔLCA (95)	-0.281	—
<i>Investment and assets</i>		
Change in investment effort (ΔEFO) (94–95)	1.295	—
Change in assets (ΔAssets) (94–95) d1limmob	-2.845*	-1.771**

Continued

Table 4 Continued

Exogenous variables	Model 1	Model 2
<i>Competition</i>		
Competitive pressure (Hi) (95)	-0.478	—
ΔHi (95)	-0.307	-0.344*
<i>Financial market variables</i>		
Change in capitalization (ΔCapi) (94–95)	0.160	—
Return on stocks/CAC40	0.368	—
Restructuring (95)	-0.905*	-0.636*
Percent correctly predicted	80.6%	74%
Number of observations	222	222

Notes: The regression in column 2 includes only the variables whose estimated coefficients are significant at the 10% level.

4.1 Reducing workforce as a defensive strategy for non-listed companies close to bankruptcy

We now focus on the results of the logit model for the general set of firms, using the second specification (the estimated coefficients appear in column 3 of Table 3, model 2). First, the probability that the firm is involved in workforce reduction in 1996 rises with certain structural parameters, namely (1) the size of the firm (over 500 employees in 1995: 0.611) as in, for example, Budros (1997) and Coucke *et al.* (2007); the proportion of older workers (over 50 years old in 1995: 1.925); (3) the share of part-time workers in 1995 (0.276); (4) the wages of skilled workers (LCHQ2 = 0.17); and (5) the Herfindahl index (hi_95: 0.935).⁹ Firms that were initially facing less competitive pressure were possibly oversized and adjusted their workforce in 1996. This suggests that large firms with monopoly power and high wages for skilled workers have a greater probability of workforce reductions.

Second, workforce reduction is correlated with a financial structure that is closer to bankruptcy. As expected, the probability of reducing the workforce is greater in companies with a lower ROE (-0.585), and greater long-term debt pressure (Lpress: 0.379) and insolvency (interest cover: 5.758). This insolvency effect pertains even conditional on the leverage implied by lower firm assets (ΔAssets_95: -0.746) in 1994–95. These results suggest that downsizing firms experience considerable financial difficulties and may be facing bankruptcy.

⁹We first compute a Herfindahl index for each of the 600 sectorial activities in which companies are classified. For activity k , this index is computed as a ratio between the sum of squared sales at the company level, and the square of total sales in this activity.

Third, the cost of unskilled labour does not predict workforce reductions. As such, downsizing seems to stem from factors outside the firm, on the demand side, such as lower sales (sales turnover: -0.993). Employment reduction then appears as a flexible and defensive response to lower sales and profitability. This last result is similar to that in Cappelli (2000: p. 21): ‘Excess capacity associated with shortfalls in demand has been seen as a main cause of layoffs’. Note that due to the gloomy economic outlook, firms reduce employment even conditional on productivity ($\Delta_Lprod = 0.263$). Greater labour productivity is a necessary step prior to reducing the workforce without disorganizing production. However, a rise in the cost of the highest-skilled workers reduces the probability of downsizing ($\Delta LCHQ3 = -0.221$). This means that firms do not necessarily consider the wages of highly skilled workers as a cost that should be reduced.

We thus learn from this logisitic regression that job destruction occurs in firms that are in difficulty, mainly from a fall in sales in the context of competitive pressure. Thus, faced with low profitability, employment reduction appears as a flexible response that may avoid the firm going to the wall. These results lead us to conclude that downsizing is a defensive strategy.

4.2 Reducing the workforce as a defensive response by listed companies to poor financial position

We now estimate the probability that a publicly listed firm is involved in workforce reduction. Columns 3 and 4 in Table 4 show the results of a logit model that includes almost the same dependent variables as those used in the previous model, with two exceptions. First, we exclude the variable ‘group’, as all publicly listed companies belong to a group. Second, we include stock market–based variables: the change in capitalization, a dummy variable indicating whether the firm’s stock outperformed the CAC40 index,¹⁰ and a dummy variable called ‘adjust’ that indicates whether the stock price has been adjusted by the firm. Column 3 shows the results from the benchmark model, and column 4 reports only the variables that are significant at the 10% threshold. Share price adjustment is negatively correlated with workforce reduction (adjust_95: -0.636) and may pick up considerable restructuring in the previous year, such as a merger or an acquisition, which usually leads to a change in the number and price of shares. Workforce reductions in 1996 are more likely to occur in firms whose competitiveness is diminished by higher labour costs of unskilled

¹⁰This index is made up of 40 shares, selected from the 100 largest companies listed on Euronext Paris, measured in terms of market capitalization. As the CAC40 is the benchmark for Euronext Paris, it is widely used by portfolio managers to measure performance. In 1996, the CAC40 index fell by 9.09%. The dummy variable is computed as $1(\Delta \text{ Share Price} > \Delta \text{ CAC40})$.

workers (lchq1_95: 1.747). Both the share and the wages of highly skilled workers (q3_95: -1.99 , lchq3_95: -1.597) are negatively correlated with the probability of downsizing. Second, listed companies are more likely to reduce their workforce when they are in a more competitive sector (d1_Hi95: -0.344) with an inadequate skill structure. For example, a smaller proportion of skilled workers (q3_95: -1.99) at lower cost (lchq3_95: -1.597) increases the probability of layoffs. Finally, workforce reduction seems to be a strategic response to a poor financial (rather than economic) position. Downsizers do face financial difficulties, such as greater debt pressure and a lower ROE (respectively, debt rate = 0.698, and ROE_95 = -4.714). They deal with a higher level of debt by reducing their assets in 1994–95 (Δ assets_95: -1.771). However, and this is a major difference from the general set of firms, the demand side, as measured by sales turnover, is not a significant predictor of layoffs. Firm size is not found to predict workforce reductions, contrary to the results in Ahmadjian and Robinson (2001) for listed firms in Japan. Financial variables are the only significant predictors for listed companies, for whom downsizing appears as a defensive response to poor financial performance.

5. Estimating the impact of workforce reductions

We do not attempt to estimate a causal model here, which would evaluate the impact of downsizing. The aim is to plot out the future trajectories of firms that are in an unfavourable context, where this latter has led them to reduce employment.

5.1. *Non-listed companies: a small but significant improvement in major performance indicators*

As expected, the simple and corrected OLS estimators differ. In Tables 5 and 6, we report the impact of a workforce reduction (the dummy variable T) for both the simple (second column) and the corrected OLS estimator (third column). Each row refers to a different regression, in which one of the economic indicators (first column) is explained by the dummy variable T for the simple estimator, and also a complete set of control variables in the corrected estimation.

For the general set of companies, workforce reduction improves labour productivity in the long run, by 2.21% according to the simple estimation, although the corrected OLS estimator gives a lower figure of only 1.21%. However, the net gain is a more accurate measure because it includes the contemporary effects of 1995–96. Consequently, while the simple analysis estimates the net gain at 2.21% between 1995 and 2000, most of the increase subsequently vanishes according to

Table 5 The estimated impact of workforce reductions (full sample)

Variables	Full sample					
	Short-term differences (1995–96)		Medium-term differences (1996–97)		Long-term differences (1996–2000)	
	Simple DID	Corrected OLS	Simple DID	Corrected OLS	Simple DID	Corrected OLS
Profitability ratios						
Return on assets (Δ ROA)	NS	0.0187** (0.004)	0.026** (0.005)	0.0191** (0.004)	0.0578** (0.007)	0.0374** (0.007)
Return on equity (Δ ROE)	NS	-0.0187** (0.004)	0.025** (0.004)	0.017** (0.004)	0.02299** (0.008)	0.172** (0.008)
Operating ratios						
Profit margin (Δ PMARG)	NS	-0.003** (0.001)	0.004** (0.001)	0.003** (0.001)	0.007** (0.001)	0.047** (0.001)
Labour productivity (Δ LPROD)	NS	-0.010** (0.004)	0.013** (0.004)	0.009** (0.004)	0.022** (0.006)	0.012** (0.006)
Labour costs (Δ LCOST) total	0.039** (0.001)	0.005** (0.001)	NS	NS	-0.004* (0.003)	NS
Δ LCOST Q1 (log)	NS	NS	NS	NS	NS	NS
Δ LCOST Q2 (log)	NS	0.003** (0.001)	NS	NS	-0.006** (0.002)	NS
Δ LCOST Q3 (log)	NS	NS	NS	NS	NS	NS
Liquidity ratios						
Long-term debt pressure Δ LPRES	-0.003* (0.002)	NS	-0.008** (0.002)	-0.006** (0.002)	NS	NS
Debt rate Δ DEBT	NS	-0.058** (0.013)	0.044** (0.013)	0.031** (0.013)	NS	NS
Investment effort						
Δ EFFO	-0.019** (0.003)	-0.028** (0.002)	0.016** (0.002)	0.014** (0.00242)	0.027** (0.003)	0.022** (0.003)
Sales, assets						
Sales Δ Lsales (log)	-0.081** (0.003)	-0.080** (0.003)	-0.026** (0.003)	-0.022** (0.003)	-0.045** (0.006)	-0.031** (0.006)
Δ Lassets (log)	-0.048** (0.003)	-0.037** (0.003)	-0.029** (0.003)	-0.021** (0.003)	-0.086** (0.006)	-0.052** (0.006)
Employment						
Workforce level						

Continued

Table 5 Continued

Variables	Full sample					
	Short-term differences (1995–96)		Medium-term differences (1996–97)		Long-term differences (1996–2000)	
	Simple DID	Corrected OLS	Simple DID	Corrected OLS	Simple DID	Corrected OLS
Δ LABOUR (log)	–0.194** (0.002)	–0.188** (0.002)	NS	0.007** (0.004)	–0.03** (0.009)	NS
Qualifications						
Δ Q1	–0.005** (0.001)	–0.004** (0.001)	NS	NS	NS	NS
Δ Q2	0.002* (0.001)	NS	NS	NS	NS	–0.005** (0.002)
Δ Q3	0.003** (0.003)	0.004** (0.001)	NS	NS	NS	NS

Notes: Standard errors appear in parentheses; **p-value < 0.05; *p-value < 0.10; NS stands for not significant at the 10% level. Endogeneous variables appear in the first column. Each row corresponds to a separate regression, where the indicator in question (e.g., the change in ROE between 1995 and 1996) is explained by the dummy variable T reflecting employment policy (in the simple DID estimator) and the control variables (in the corrected OLS estimation). Only the coefficient on the dummy variable is reported, if this is significant.

Table 6 The estimated impact of workforce reductions (listed firms of sub-sample)

Variables	Short-term differences (1995–96)		Medium-term differences (1996–97)		Long-term differences (1996–2000)	
	Simple DID	Corrected DID	Simple DID	Corrected DID	Simple DID	Corrected DID
Profitability ratios						
<i>Return on assets</i> (Δ ROA)	NS	NS	0.037** (0.021)	NS	NS	NS
<i>Return on equity</i> (Δ ROE)	NS	NS	NS	NS	NS	NS
Operating ratios						
<i>Profit margin</i> (Δ PMARG)	NS	NS	NS	NS	NS	NS
<i>Labour productivity</i> (Δ LPROD)	NS	NS	0.122* (0.071)	0.124* (0.072)	0.153** (0.076)	0.145** (0.075)
<i>Labour costs</i> (Δ LCOST)	NS	NS	NS	NS	NS	0.091* (0.045)
Δ LCOST Q1 (log)	NS	NS	0.049* (0.025)	0.057* (0.024)	NS	NS
Δ LCOST Q2 (log)	NS	NS	NS	NS	0.039* (0.020)	NS
Δ LCOST Q3 (log)	0.037* (0.021)	NS	NS	NS	NS	NS
<i>Liquidity ratios</i>						
Long-term debt pressure Δ LPRES	NS	NS	– 0.038* (0.021)	NS	– 0.089** (0.043)	NS
Debt rate Δ DEBT	NS	NS	NS	NS	NS	NS
<i>Investment effort</i>						
Δ EFFO	NS	NS	NS	NS	NS	NS
<i>Sales, Assets</i>						
Sales Δ Lsales (log)	– 0.027** (0.009)	NS	NS	NS	NS	NS
Δ Lassets (log)	NS	NS	– 0.046** (0.021)	NS	– 0.122* (0.071)	NS
<i>Employment</i>						
<i>Workforce level</i>						
Δ LABOUR (log)	– 0.205** (0.029)	– 0.17** (0.030)	NS	NS	– 0.164* (0.091)	NS

Continued

Table 6 Continued

Variables	Short-term differences (1995–96)		Medium-term differences (1996–97)		Long-term differences (1996–2000)	
	Simple DID	Corrected DID	Simple DID	Corrected DID	Simple DID	Corrected DID
<i>Qualifications</i>						
ΔQ1	NS	NS	NS	NS	NS	–0.029* (0.016)
ΔQ2	NS	NS	NS	NS	NS	NS
ΔQ3	NS	NS	0.027* (0.011)	NS	0.050** (0.022)	0.054** (0.022)

Notes: Standard errors appear in parentheses; **p-value < 0.05; *p-value < 0.10; NS stands for not significant at the 10% level. Endogenous variables appear in the first column. Each row corresponds to a separate regression, where the indicator in question (e.g., the change in ROE between 1995 and 1996) is explained by the dummy variable T reflecting employment policy (in the simple DID estimator) and the control variables (in the corrected OLS estimation). Only the coefficient on the dummy variable is reported, if this is significant.

the corrected OLS estimator (0.16%).¹¹ This low productivity estimate may reflect a lack of motivation by surviving workers or the stress associated with possible future layoffs. Furthermore, higher productivity does not imply greater profitability, as the labour–cost gap is significantly wider, although the increase is small in magnitude (the labour–cost gap between downsizing and other firms is 0.39%, or 0.50% higher in the short run).

Regarding the financial position of firms, the estimates provide very different results. The simple estimates show, after 1996, buoyant growth in profitability (ROA: 5.77 points, and ROE: 2.29 points in the long run) and a greater profit margin (0.74 points). The positive effects of workforce reduction are long-lasting: investment effort increases (2.72 points), meaning that firms have become more confident about their future prospects. However, there is no significant change in long-term debt pressure or the debt rate. Overall, the simple estimator seems to tilt in favour of a successful offensive downsizing, with a positive impact of cutbacks on financial figures, in both the short and the long run.

The conclusions from the corrected estimator are very different. Though there was no significant effect on profitability according to the simple estimator between 1995 and 1996, the corrected OLS estimator paints the opposite picture, whereby the main financial indicators deteriorated sharply, especially ROA (–1.86 points) and ROE (–1.87 points). This downturn should be attributed to a fall in demand. Therefore, the cutbacks are consistent with a defensive model of downsizing. Once selection bias has been corrected, most of the net gain in ROE and profit margin vanishes, meaning that firms that make large layoffs are no longer those with greater profitability growth.

However, over the whole period under consideration, 1995 to 2000, the change in the ROA gap between the two groups of firms is significant with a net gain of 1.8 points ($0.037 - 0.019 = 0.018$). This net gain is not consistent with defensive downsizing and calls for further investigation into the change in assets and sales. First, both the simple and corrected estimators indicate that the gap in assets increases in the long run, showing that downsizing firms follow a different pattern of asset capitalization. This could indicate a so-called asset-light strategy, by which the company slows down its investments. Second, the gap in assets widens by more than the gap in sales (simple estimate = –8.57% versus –4.55%; corrected OLS estimate = –5.26% versus –3.06%). Employment downsizers have thus managed to increase their average amount of sales per unit of capital more than employment upsizers have. This gain in productive efficiency, which is three times smaller in the corrected OLS estimation than in the simple estimation, is at the core of a net long-run increase in ROA.

¹¹For example, 1.21% refers to column 7, from which we take away the short-term effect of 1.047% (column 3) for a net effect of 0.16%.

5.2 *Listed companies: the estimates are not significant*

We now turn to the impact of workforce reductions in publicly listed firms. For these companies, as expected, the main result is that workforce reduction has no effect on future economic performance (ROE and ROA). However, the heightened labour productivity exhibited by the simple and corrected OLS estimations, continues its upward trend in 1997 and 2000 (respectively, at 12.37% and 14.53% in the corrected OLS estimations), while labour costs grow more slowly (9.14% in 1996–2000). This gap suggests that some profitability gains do exist but have not yet been transformed into a higher ROE.

The foregoing results for listed companies can be compared to those in [Wayhan and Werner \(2000\)](#) for a set of the 250 largest US corporations. Basing their estimates on the changes in capitalization and sales, the authors insist that the pressure stockholders place on listed companies produces downsizing. In our data, in the logit estimates, listed firms that downsized are also characterised by low ROE. However, their stocks did not under-perform in the year prior to the workforce reduction. Finding a positive but fragile impact of workforce reduction on financial performance in the short run, Wayhan and Werner argue that workforce reduction could lead to lower costs, which are leveraged into a competitive advantage by the firm's management. On the contrary, our corrected OLS estimates show an increase in labour costs and consequently no rise in profitability.

6. Concluding remarks

This article provides the first comparison of the relationship between workforce reduction and firm performance in listed and non-listed companies. It yields evidence that the nature of the performance deterioration that triggered workforce reduction differs between the two groups of firms. The first group was dealing with financial distress, and the second was struggling with a poor economic position, was close to bankruptcy, and used workforce reductions as a defensive response to a fall in sales. Moreover, downsizing is a decision taken at different stages in the performance downturn by different firms. The reason may lie in the structure of governance.

Listed firms, responding to shareholders, downsize before approaching bankruptcy. Defensive layoffs are purported to improve the financial position before it becomes too severe. On the contrary, other firms employ layoffs as a last-resort strategy to avoid bankruptcy. This result provides evidence for defensive downsizing, rather than the offensive strategy presented in the management literature. Moreover, in the general set of firms, downsizing is not driven by shareholders. Second, if we do not correct for selection bias, our results are the same as

those of some scholars in management research: a positive effect of downsizing on firm performance (Bruton *et al.*, 1996; Cascio *et al.*, 1997; Kang and Shivdassani, 1997; Palmon *et al.*, 1997; Espahbodi *et al.*, 2000; Chen *et al.*, 2001; Yu and Park, 2006). Third, when we do correct for selection bias, our estimates do not support the management thesis. In the corrected difference-in-differences estimates, for the general set of firms, productive efficiency (ROA) rises, but only at a slow rate: 1.8% between 1995 and 2000. This figure is three times smaller than that in the simple estimation. This is due to a greater rise in sales per unit of capital among employment downsizers than employment upsizers. Finally, the article provides evidence that for listed and non-listed groups, downsizing does not improve financial performance (ROE). For non-listed companies, this stems from the priority given to economic rather than financial figures. Further research should examine why listed companies do not improve their financial ratios, although these are a priority in their strategic plans. In the same spirit as Ahmadjian and Robinson (2001) regarding Japan, further research should also examine the spread of downsizing, focusing on economic and institutional pressures on firms. This would provide an institutional dimension to downsizing policies.

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