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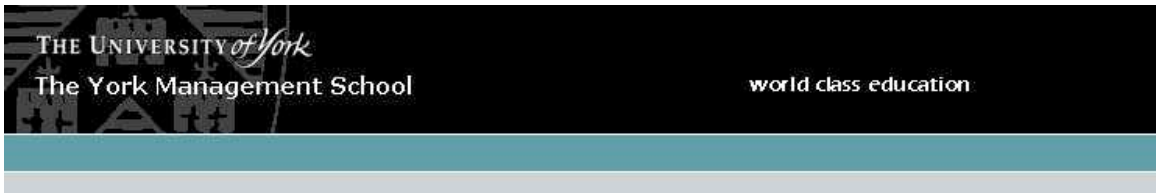

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Cause and effect relationship between post-merger operating performance changes and workforce adjustments

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Cause and effect relationship between post-merger operating performance changes and workforce adjustments

1.1 Introduction

1.1.1 Research motivation

Prior empirical research provides substantial evidence showing that mergers and acquisitions lead to operating performance decline (Ghosh, 2001). At the same time such transactions involve workforce reductions, as reported in the public media. However, systematic empirical evidence on the association between operating performance and workforce adjustments is inconclusive. On the one hand workforce reductions may be undertaken to improve efficiency and firm profitability (Cascio et al., 1997) or to arrest further performance deterioration. On the other, post-takeover layoffs may be undertaken to create shareholder value and to regain premiums paid to targets. Consequently, it is suggested that such layoffs destroy the human capital of acquired firms and thereby negatively affect firm performance post-merger (Krishnan et al., 2007). Thus, the answers to (1) whether post-takeover performance decline leads to workforce reductions and (2) whether such layoffs positively or negatively affect firm performance are unknown. This chapter aims to provide new empirical evidence on these two questions. Empirical evidence on these questions would clarify whether post-merger labour management decisions are made to further enhance efficiency and firm profitability.

Although there is well established research of the antecedents and consequences of workforce downsizing, it is still unclear whether prior poor performance determines subsequent downsizing decisions and whether such workforce reductions lead to performance improvement (Datta et al., 2010). There is evidence that supports the view that firm performance is an important factor in

explaining workforce reductions (Coucke et al., 2007; Hillier et al., 2007). At the same time, there is also some evidence showing no link between prior performance and downsizing (Perry and Shivdasani, 2005). Similarly, empirical evidence on the consequences of workforce adjustments for firm performance is inconclusive. A general conclusion of this research is that employee layoffs positively affect performance only when there is a slack to cut (Cappelli, 2000; Love and Nohria, 2005).

Although empirical research that investigates the factors leading to post-merger workforce reductions is well established (O'Shaughnessy and Flanagan, 1998; Conyon et al., 2001, 2002; Gugler and Yurtoglu, 2004), empirical research investigating the consequences of post-merger workforce adjustments is still in its infancy. There are very few studies on this issue: Krishnan and Park (2002) and Krishnan et al. (2007) show that in related acquisitions excessive layoffs, which are made to cover large premiums, lead to organisational performance deterioration.

The situation is complicated by the requirement that the association between operating performance and workforce reductions should be analysed within the broader context of takeovers' effects on firm performance. Although research on the effect of takeovers on firm performance is well established, evidence on this issue is mixed as well: some studies report modest operating performance improvement after takeovers, other studies report performance decline over a two-to-five year period following acquisitions, yet other studies report indistinguishable operating performance improvement in comparison to a sample of non-merging benchmark firms (Martynova et al., 2007). Taking into consideration post-takeover operating performance change is important, as failure of business integration and post-takeover deterioration in operating performance may lead to employee layoffs.

This chapter investigates the role of post-takeover operating performance decline as a factor leading to workforce reductions. Then it investigates the consequences of such workforce reductions for firm performance. The empirical work of this chapter links three strands of literature: (1) research on antecedents and consequences of workforce downsizing, (2) research on performance consequences of employee layoffs following mergers and (3) research on performance consequences of takeovers. Using research methods from these strands of literature, we measure performance change and workforce change following mergers and investigate the association between these two variables. In addition to the full sample analysis, we compare the performance of the WFG and WFR sub-samples[1]. In the multiple regression context, first we examine the association between post-takeover operating performance *changes* and post-takeover workforce *changes* in order to understand whether performance decline leads to workforce reductions. To examine whether workforce adjustments negatively or positively affect performance, we then regress workforce *changes* one year after mergers (from t-1 to t+1) on operating performance *change* over three years.

1.1.2 Brief results and contributions

Using the full sample, the univariate analysis reveals that performance does not improve after takeovers, but, on the contrary, declines, which is consistent with most of the research in this area. When the sample is split, the results show that the performance decline is steeper in the

[1] These terms are explained in the previous chapter.

WFR sub-sample during the first two post-takeover years, while the performance decline is steeper in the WFG sub-sample during the third post-takeover year.

The regressions show a strong positive association between operating performance change and workforce change following mergers, which means that performance deterioration is an important factor in explaining employee layoffs post-merger. In terms of operating performance consequences, the results show that workforce *changes* are inversely related to operating performance *change*. Therefore it can be concluded that post-merger workforce reductions positively contribute to operating performance change.

The results of this chapter contribute to the literature on the antecedents and consequences of merger-related employee layoffs by providing new evidence on the positive role of corporate downsizing in the mergers and acquisitions context. The results suggest that post-takeover performance decline could be one of the reasons for workforce adjustments. The conclusion that post-merger workforce reductions positively contribute to operating performance change implies that labour management decisions are made in order to improve efficiency and to maintain the viability of the firms.

1.2 Theoretical background and hypothesis development

One factor that may lead to post-takeover workforce reductions is firm performance decline after such transactions. Mergers may negatively affect firm performance for several reasons, such as unsuccessful business integration, inadequate strategic fit or cultural differences between merging firms.

Although accounting studies do not investigate the issues of why firm performance may deteriorate post-merger, these studies thoroughly measure performance change post-merger. However, the extant evidence on the operating performance consequences of takeovers is mixed: some empirical research shows that takeovers cause only modest improvement (Healy et al., 1992; Powell and Stark, 2005) or no improvement (Ghosh, 2001), while other studies report significant decline in firm performance (Martynova et al., 2007). Reviewing the literature in this area, Martynova et al. (2007) find that 14 out of 25 studies report significant decline in post-takeover operating performance, 6 studies report insignificant change, while 5 studies report significant improvement in operating performance after takeovers. For example, Meeks (1977) and Ravenscraft and Scherer (1987) report that profitability of merging firms declines significantly. Thus, most evidence indicates that acquirers' performance deteriorates.

The conventional view is that firm performance is an important factor in downsizing decisions. Prior research concludes that performance decline often leads to employee layoffs (Iverson and Pullman, 2000; Chen et al., 2001). For example, Hillier et al. (2007) find that layoffs follow a period of poor operating and stock price performance. Coucke et al. (2007) report that firms make redundancies after a decline in return on equity. Therefore it is reasonable to expect workforce reductions following performance deterioration during a post-takeover period. Such a

performance decline may necessitate workforce reductions. On the basis of this discussion, the following hypothesis will be tested[2]:

Q2-H1: *Post-takeover decline in operating performance leads to workforce reductions.*

Although corporate downsizing is usually undertaken to cut costs and to further enhance efficiency, it may negatively affect firm performance, especially when it follows mergers. Recent evidence presented by Krishnan et al. (2007) shows that excessive employee layoffs after related acquisitions, undertaken to cover high premiums, lead to significant performance deterioration. There are several reasons for this adverse effect of labour cost cuts within the mergers and acquisitions context.

The success of an acquisition depends on the ability of firms to effectively integrate acquired intangible capital in the form of human resources, which embody valuable tacit knowledge (Seth et al., 2002). First, managers may not be able to correctly estimate the required level of employee layoffs to achieve the optimal employment level. Second, in this process some senior key staff of acquired firms may voluntarily leave due to disagreement with the new management (Walsh, 1988). In support of this, Martin and McConnell (1991) and Franks and Mayer (1996) show that

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[2] Post-takeover firm performance decline could be another reason for post-merger employee layoffs, as acquirers undertake labour cost cuts to stop further performance deterioration. This hypothesis could be tested by regressing workforce adjustments on post-takeover performance.

management turnover is significantly higher after acquisitions than in normal periods. Third, in the case of workforce reductions it may be difficult to determine whom to layoff, especially when most managers and 'white collar' workers of an acquired company leave the combined business. Finally, the post-layoff morale of surviving staff may be low due to uncertainties about their own future. Cascio (1993) argues that downsizing may lead to poor morale in the surviving employees, creating 'survivors' syndrome' and decreasing labour productivity.

Furthermore, the resource-based view of the firm can be used to explain the negative effect of downsizing in the mergers and acquisitions context. According to this theory the departure of key staff destroys acquired firms' strategic capabilities and this leads to poor performance. According to this theory human capital is one of the three main resources that enable firms to implement value-creation strategies, along with physical capital resources and organisational capital resources (Barney, 1991). Among other things, human capital includes training, experience, relationships and insights of individual managers and workers. If, in the integration process, this resource is destroyed, then the strategic competitiveness of the firm is no longer sustainable. Moreover, as the resource-based view considers a firm as a bundle of the above resources, routines and capabilities, the role of mergers and acquisitions is to facilitate the exchange of these firm-specific resources and capabilities that are otherwise costly to imitate and are not tradable (James, 2002).

In sum, mergers and acquisitions may negatively affect human capital, destroying one of the most important strategic capabilities of the firm that is difficult to imitate. Therefore employees view such transactions as destructive events, because they increase job uncertainty, risk and stress, which in their turn may negatively affect the firm's performance. Such changes in the work

environment may also change employees' work attitude, which in its turn negatively affects employee performance and subsequently firm performance.

In contrast, it has been shown that post-merger workforce reductions lead to rationalisations in the use of labour and increased efficiency (Conyon et al., 2002) and improve employee profitability (Conyon et al., 2004). Thus, post-merger downsizing should lead to improvement in firm performance.

Post-merger employee layoffs are a part of wider corporate downsizing activity. Although the effect of corporate downsizing on firm performance has been researched extensively, the extant evidence is inconclusive. Palmon et al. (1997) show that downsizing inversely affects firm performance, while Elayan et al.(1998), Espahbodi et al. (2000), and Chen et al. (2001) report significant firm performance improvement and an increase in labour efficiency after downsizing. However, Cascio et al.(1997), Denis and Kruse (2000) and Love and Nohria (2005) report that downsizing does not alter firm performance in general. Cascio et al. (1997) conclude that only those firms that combine downsizing with asset sales improve profitability. Cappelli (2000) argues that downsizing makes sense only when establishments experience excess operating capacity. Otherwise, downsizing may hurt firm performance, as trying to cut slack when there is no slack to cut may negatively affect organisational capabilities. The Love and Nohria (2005) results show that downsizing only improves performance when there is a good deal of organisational slack and when downsizing is a part of broad corporate restructuring and is done during the periods of stability or performance improvement.

Even though employee layoffs positively affect performance, their full effect might only be felt after some time – 2 to 3 years after downsizing (Palmon et al., 1997; Espahbodi et al., 2000; Perry and Shivdasani, 2005). Meanwhile the downsizers' performance *level* may still be low in comparison to that of non-downsizers, even though there is positive performance *change* during early periods after layoffs. Hillier et al. (2007) show that layoff-making firms continue to under-perform their industry benchmark three years after the event. In other words, the extent of performance change in layoff-making acquirers may be different from that of acquirers that do not make layoffs, due to the positive effect of labour rationalisations. Therefore we investigate the association between post-merger employee layoffs and performance change:

Q2-H2: *Post-takeover workforce changes are inversely associated with operating performance changes*.

1.3 Data and methodology

1.3.1 Econometric model specification

To test the hypothesis Q2-H1 the following model will be estimated:

$$\Delta E_{t+3} = \alpha + \beta_1 \Delta ROA_A^{post} + \beta_2 H + \beta_3 R + \beta_4 Prem + \beta_5 Size + \beta_5 Lev + \beta_7 Board + \varepsilon \qquad (2)$$

where ΔE_{t+3} is the change in the number employees from t-1 to t+3, ΔROA_A^{post} is the first post-takeover two years' (t+1 and t+2) average change in operating performance of acquiring firms; *H* is a hostility dummy, which takes 1 if the initial offer was rejected and 0 otherwise; *R* is a relatedness dummy, which takes 1 if both target and acquiring firms are in the same industry and 0 otherwise; *Prem* is the premium, measured as the excess amount of bid price over share price one month prior to takeover announcement; *Size* is the ratio of acquiring firm size to the transaction value (target firm size); *Lev* is the debt-to-equity ratio at the end of the takeover

completion year; *Board* is the ratio of non-executive directors to the total number of directors, and ε indicates the error term. In extended models we also include the interactions of the *R* and *H* dummies with the performance change variable (ΔROA_A^{post}).

To test the hypothesis Q2-H1 the following model will be estimated:

$$\Delta ROA_{t+3}^{a} = \alpha + \beta_1 \Delta E_{t+1} + \beta_2 Prem + \beta_3 \Delta ROA^{c} + \beta_4 Size + \beta_5 Lev + \beta_6 Board + \beta_7 H + \beta_8 R + \varepsilon \quad 3$$

where ΔROA_A^{post} is the performance change during three post-takeover years (from *t-1* to *t+3*); ΔE_{t+1} is the change in the number employees from *t-1* to *t+1*, ΔROA^{c} is the change in matched firm performance during the corresponding period, and other variables are as explained above.

In these models we control for relative size, leverage and board structure on the basis of prior research. First, the integration of larger firms may create a greater challenge as well as more synergy than the integration of smaller firms. In this relation, McGuckin and Nguyen (2001) and Conyon et al. (2002, 2004) find that the impact of acquisitions depends on the size of acquisition. Therefore we control for the relative size measured as the ratio of acquired firm size (transaction value) relative to acquirers' market value at the end of t-1. Ofek (1993) that argues that higher leverage following poor performance increases the probability of corporate restructuring, including employee layoffs. Therefore in the takeover context higher leverage may also force acquirers to cut costs by reducing the workforce. We measure leverage as the ratio of debt to total assets at the beginning of the relevant year. Finally, a greater number of non-executives on the Board of Directors may force managers to undertake restructuring activities that maximise shareholder value and prior research suggests that the higher number of executive directors, the

more effective the Board (Cosh et al., 2006). Therefore we control for the Board structure of the acquiring firms, measured as the ratio of outside directors to inside directors.

1.3.2 Data and measuring post-takeover workforce adjustments

This chapter uses the same sample and data as described in the previous chapter. Post-merger workforce change is measured using the same technique as in the previous chapter.

1.3.3 Measuring post-takeover operating performance change

The operating performance measure (ROA, measured as earnings before interest, taxes, depreciation and amortization divided by total assets), has been adjusted using two benchmarks: industry-median firm and industry-, size- and performance-matched firm benchmarks, selected on the basis of methodology recommended by Barber and Lyon (1996). Industry-adjusted performance is obtained by deducting industry-median firm performance from the sample firm performance[3].

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[3] We also scaled EBITDA by Total Market Value (TMV), which is defined as the market value of outstanding shares plus preferred stock and book value of total liabilities at the beginning of each year. In addition to this we use Operating Cash Flow (OCF) defined as operating income plus depreciation, depletion and amortisation expense, scaled by TMV and TA. Barber and Lyon (1996) conclude that test statistics on the basis of OCF are uniformly less powerful than those on

The industry-, size- and performance-matched firm benchmark is one of the most frequently used performance benchmarks in contemporary accounting and finance research (Espahbodi et al., 2000). This benchmark performs better than the industry-median firm benchmark, especially when sample firms have performed either unusually well or unusually poorly (Barber and Lyon, 1996). As firms may undertake acquisitions during better-performing years, matching on pre-takeover performance controls for the potential bias arising due to mean reversion in earnings.

Following the methodology proposed by Barber and Lyon (1996) and Loughran and Ritter (1997), for each sample firm we select a matching firm at the end of year t-1 on the basis of the following criteria: first, we filter all firms in the same industry with the sample firm; second, we select all firms within the 25% to 200% size interval of the sample firm's size, size being measured by total assets; third, we select the non-acquiring firm with the closest performance measure to the matching firm. In order to capture the full differences in the performance of acquiring and non-acquiring firms, the matched firms should not have undertaken any significant acquisition around the sample takeover event which is being investigated. Therefore, as matched firms we select only those firms which have made significant acquisitions during the two years

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the basis of other performance measures. Therefore we only report the results on the basis of EBITDA scaled by theTA measure.

before takeovers and three years after takeovers. Matched-firm-adjusted performance is obtained by deducting the matched firm's performance from the sample firm performance.

Following Ghosh (2001) we use 'the change method' to measure the operating performance effect of takeovers. Ghosh (2001) argues that this method is superior to the regression method suggested by Healy et al. (1992), which identifies the performance change as the intercept of the regression of post-takeover performance on pre-takeover performance. As firms undertake acquisitions after superior performance, acquirers outperform industry medians during pre-takeover years. Ghosh (2001) points out that this non-random measurement error will result in a biased intercept in the regression, showing the positive effect of acquisitions. If, on average, merging firms do not outperform industry-median firms, then the regression method and the change method should provide identical unbiased estimates. Following other studies (Healy et al., 1992), the pre-takeover pro-forma combined performance measure is constructed by summing the target and acquirer performance measures at the end of year t-1. This pro-forma performance is subtracted from the post-takeover performance to identify the change in the industry (or industry, size and pre-takeover performance) adjusted performance.

1.4 Results

1.4.1 Univariate analysis of post-takeover performance change

Table 4 reports performance change during post-takeover years relative to the pre-takeover level for the whole sample as well as for the WFR and WFG sub-samples. As reported in Panel A, the full sample, acquirers' unadjusted firm performance declines significantly during the post-merger years relative to the pre-merger level. This is consistent with the Powell and Stark (2005) and Martynova et al. (2007) results. The results also show that full sample acquirers outperform their

industry-median firms during the first two post-takeover years and outperform their matched firms during the first post-takeover year. However, acquirers' industry-adjusted performance declines significantly relative to the pre-merger level during all three years: the three-year median industry-adjusted performance is 1.1% lower than the pre-merger level. Similarly, matched-firm-adjusted performance shows that performance declines during the third post-takeover year.

The above results suggest that takeovers at best do not improve operating performance, which is consistent with most of the prior research (Martynova et al., 2007). This performance decline could be due to the fact that firms undertake acquisitions during or immediately after better-performing periods.

Table 1 Post-takeover operating performance

Year around merger	Unadjusted performance	z-stat	Industry median firm adjusted performance	z-stat	Matched firm adjusted performance	z-stat
Panel A: Full sample						
t-1	0.2139		0.0255	4.99	0.0080	2.76
t+1	0.1700		0.0127	2.98	0.0145	1.95
t+2	0.1511		0.0113	1.71	0.0144	1.31
t+3	0.1429		0.0102	1.16	-0.0052	-0.34
Median for t+1, t+2 and t+3	0.1528		0.0115	2.55	0.0048	0.99
t+1 *less* t-1	-0.0388	-6.56	-0.0043	-1.73	-0.0070	0.24
t+2 *less* t-1	-0.0688	-8.37	-0.0209	-3.22	0.0013	-0.53
t+3 *less* t-1	-0.0801	-8.89	-0.0174	-3.23	-0.0056	-2.07
Post median *less* t-1	-0.0532	-7.73	-0.0111	-2.53	-0.0089	-1.12
Panel B: The WFG sub-sample						
t-1	0.2296		0.0527	4.58	0.0195	2.97
t+1	0.1980		0.0340	4.57	0.0197	2.11
t+2	0.1755		0.0331	3.84	0.0268	2.24
t+3	0.1515		0.0243	2.21	-0.0005	-0.11
Median for t+1, t+2 and t+3	0.1680		0.0302	4.43	0.0184	1.70
t+1 *less* t-1	-0.0277	-2.89	0.0019	-0.25	-0.0011	0.12
t+2 *less* t-1	-0.0399	-3.25	-0.0010	-0.48	0.0098	0.47
t+3 *less* t-1	-0.0661	-4.96	-0.0200	-1.98	-0.0101	-1.91
Post median *less* t-1	-0.0399	-3.93	-0.0062	-0.92	0.0002	-0.45
Panel C: The WFR sub-sample						
t-1	0.1980		0.0171	0.11	0.0021	0.60
t+1	0.1531		0.0012	-0.27	-0.0007	1.02
t+2	0.1398		0.0014	-1.49	-0.0080	0.14
t+3	0.1312		0.0004	-0.64	-0.0086	-0.39
Median for t+1, t+2 and t+3	0.1425		0.0007	-0.71	-0.0067	0.29
t+1 *less* t-1	-0.0505	-6.21	-0.0071	-1.91	-0.0088	0.79
t+2 *less* t-1	-0.0933	-6.84	-0.0319	-3.17	-0.0058	-0.75
t+3 *less* t-1	-0.1031	-5.53	-0.0142	-1.54	-0.0035	-0.73
Post median *less* t-1	-0.0644	-6.57	-0.0137	-2.03	-0.0143	-0.46
Panel D: Difference between the WFG and WFR sub-samples						
t-1	0.0317	2.02	0.0356	-1.1	0.0175	1.46
t+1	0.0449	3.24	0.0329	0.65	0.0203	2.44
t+2	0.0357	3.71	0.0317	-0.42	0.0348	1.93
t+3	0.0203	1.40	0.0239	-0.88	0.0081	2.18
Median for t+1, t+2 and t+3	0.0255	3.24	0.0295	-0.42	0.0251	2.66
t+1 *less* t-1	0.0228	2.21	0.0090	1.14	0.0077	-0.37
t+2 *less* t-1	0.0535	2.40	0.0309	1.73	0.0156	0.96
t+3 *less* t-1	0.0370	-0.39	-0.0058	-0.42	-0.0066	1.08
Post median *less* t-1	0.0246	1.70	0.0075	0.67	0.0145	-0.09

Notes: Unadjusted performance indicates sample median firm performance. Industry median firm adjusted performance indicates the difference between industry median performance and firm performance. Matched firm adjusted performance indicates the difference between the sample median performance and matched firms' sample median performance.

As Panel B shows, the WFG sub-sample acquirers outperform their industry-median firms during three post-takeover years and outperform their matched firms during two post-takeover years. Both benchmarks show that the WFG sub-sample acquirers' performance does not differ from the pre-takeover level during the first two post-takeover years. However, both benchmarks show that this sub-sample acquirers' performance declines relative to the pre-takeover level during the third post-takeover year. The third year industry-adjusted (matched-firm-adjusted) ROA is 2% (1%) lower than the pre-takeover level.

In contrast, Panel C shows that the WFR sub-sample acquirers' performance does not differ from their industry-median performance and matched firm performance during all three years. The WFR sub-sample acquirers' industry-adjusted performance declines during the first two years, but the third year performance does not significantly differ from the pre-takeover level. This sub-sample acquirers' matched-firm-adjusted measure shows no significant change during the post-takeover years relative to the pre-takeover level.

Finally, Panel D reports that the WFG sub-sample acquirers outperform the WFR sub-sample acquirers by the unadjusted firm performance measure and matched-firm-adjusted performance measures. One explanation for the continuous under-performance of the WFR sub-sample firms may be the fact that the full effect of labour rationalisation might only be felt after some time. Therefore the WFR sub-sample performance may still be lower than the WFG sub-sample performance during the early post-takeover years. However, the WFR sub-sample's operating performance change from the pre-takeover level to the post-takeover level could be significantly different from the corresponding change in the WFG sub-sample operating performance due to the positive effect of the workforce reductions.

Consistent with this view, the above results imply that the WFR acquirers' performance further deteriorates during the first two post-merger years, necessitating the need for efficiency improvements and cost savings through labour cost cuts. Therefore although their performance is significantly low during the first two post-takeover years relative to the pre-takeover level, in the third year there is no difference between pre- and post-takeover performances. In contrast to this, in the WFG sub-sample both industry-adjusted and matched-firm-adjusted performance shows significant performance deterioration in the third year. Thus, these univariate results suggest that post-merger employee layoffs are undertaken in under-performing firms[4].

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[4] We also experiment with the above univariate analysis, splitting the full sample into "layoff" and "non-layoff" sub-samples, using merger-related layoff information. This analysis leads to similar conclusions. One explanation for less performance deterioration in the "layoff" sub-sample could be the fact that layoffs arrest further performance deterioration. Both benchmarks show that "layoff" combinations performance does not change significantly during the post-takeover years. In contrast to this, the performance of the "non-layoff" sub-group firms significantly declines during post-takeover years. "Non-layoff" acquirers' industry-adjusted performance is significantly lower relative to the pre-takeover level during two post-takeover years, while matched-firm-adjusted performance is lower in year t+3. These results indicate that employee reductions may contribute to halting further performance deterioration.

Overall, all three performance measures show that firm performance deteriorates post-merger. In this case the related question is whether this performance deterioration explains workforce reductions post-merger. The next section analyses this question using the regression technique.

1.4.2 Post-takeover performance decline as a factor leading to workforce reductions

To investigate the role of post-takeover performance decline in explaining employee layoffs, we regress post-takeover workforce adjustments on performance change. As the dependent variable, we use workforce adjustments during three post-takeover years and as the main independent variable we use the two-year average industry-adjusted operating performance change (for t+2 and t+3)[5].

As reported in Table 5, the regression results show that there is significant positive association between workforce adjustments and operating performance change. In the full sample, a 1% higher ROA during the first two post-takeover years leads to 1.78% greater workforce growth. This suggests that in the WFR sub-sample the association should be inverse, meaning that the lower the ROA, the higher the workforce reduction. In contrast, in the WFG sub-sample the association between these two variables should be positive: the better the performance, the higher the workforce growth. The WFR and WFG sub-sample regressions confirm these associations. In

[5] The results are the same when we use the change after one year and the change after two years individually.

the WFR sub-sample, operating performance is negatively associated with workforce reduction: a 1% lower ROA leads to 1.04% greater workforce reduction. In the WFG sub-sample the workforce growth variable is positively associated with the operating performance: a 1% higher operating performance leads to 0.7% greater workforce growth[6].

These regressions show insignificant difference between the impact of post-merger workforce change following hostile takeovers and that following friendly takeovers. However, related acquisitions cause significantly higher workforce adjustments than unrelated acquisitions do, as shown by the full sample results. Consistent with the Krishnan et al. (2007) results, a high premium negatively affects workforce growth, although it is only significant in the WFG sub-sample. In this sub-sample a 1% higher premium leads to 0.16% lower workforce growth. The negative coefficient of the relative organisational size indicates that the larger the acquired company, the lower the post-takeover workforce adjustment. This is consistent with the view that when a larger company is acquired there will be more duplicative activities to integrate this company into the existing business, thus providing greater scope for workforce reductions. Although signs of the leverage variable are negative in all regression models, the coefficients are

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[6] These results do not change if we control for the matched firm performance. As expected, industry-adjusted matched firm performance is strongly positively associated with merging firm performance.

not significant. Finally, consistent with the prior research, the signs of the Board structure variable indicate that outside directors play an important governance role in layoff decision-making (Yawson, 2006). The full sample regressions indicate that the lower the proportion of outside directors, the higher the workforce growth and, in contrast, the higher the proportion of outside directors, the greater the workforce reductions. The WFR sub-sample regressions confirm this association: the positive association of the Board structure variable means that when boards include a higher proportion of outside directors, they become more effective in taking layoff decisions. Thus, board composition is one of the important factors in developing more successful corporate governance practices[7].

When the models include interactions of the dummy regressors with the performance change variable, the results show that the difference between the slopes of hostile versus friendly acquisitions' operating performance effect is not significant. The full sample results indicate that in friendly acquisitions a 1% greater performance change is associated with a 2% higher workforce adjustment, while in hostile takeovers a 1% higher ROA is associated with a 1% [=1.999 – 0.932] greater workforce adjustment. Furthermore, in the WFG sub-sample the

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[7] Leverage becomes significant when we use the performance change variable after one year and the performance change after two years individually. But it becomes insignificant when we use a two-year average performance variable.

interaction term implies that in hostile acquisitions a 1% higher ROA would cause 0.36% [=1.149 – 1.484] lower workforce growth. So, the effect of operating performance on employment growth is smaller after hostile takeovers thanafter friendly mergers. However, the results show no difference between the slopes of related versus unrelated acquisitions' operating performance effect on workforce growth.

Table 2 Regression results explaining post-takeover operating performance.

Independent variables	Full sample	WFR	WFG	Full sample	WFR	WFG
Acquirers' post-takeover performance change	1.782***	- 1.035***	0.704***	1.999***	- 1.235***	1.149**
Hostility dummy	- 0.010	- 0.046	- 0.093	- 0.007	- 0.041	- 0.020
Relatedness dummy	0.137***	- 0.030	- 0.096*	0.121**	- 0.017	- 0.105*
Premium	- 0.005	- 0.077	- 0.161**	- 0.017	- 0.073	- 0.080
Relative size	- 0.043***	0.030**	0.018	- 0.044***	0.030**	0.023
Leverage	- 0.273	- 0.046	- 0.007	- 0.271	- 0.063	- 0.126
Board structure	- 0.333**	0.257*	- 0.038	- 0.325**	0.220	- 0.023
Hostility · Performance change				- 0.932**	0.118	- 1.484***
Relatedness · Performance change				- 0.337	0.454	- 0.046
Constant	0.079	0.303***	0.464***	0.094	0.317***	0.498***
F-stat	17.06	5.37	4.15	13.91	5.82	3.53
Adjusted R-square	0.36	0.35	0.15	0.36	0.35	0.19
Number of observations	183	98	83	183	98	86

Notes: The dependent variable is workforce change three years after takeovers (from *t-1* to *t+3*). Acquirers' post-takeover performance change is the average of the change after one year and the change after two years.. The estimation method is OLS, using heteroscedasticity-robust standard errors (White, 1980). Significance levels: *p<0.1, **p<0.05; ***p<0.01. Appendix 9.2 provides the definitions of the variables.

In sum, the results show that one of the factors that may lead to post-takeover workforce adjustments could be the performance decline following takeovers. The regression analysis shows significant positive association between post-takeover performance change and workforce change.

1.4.3 Consequences of post-merger workforce adjustments for operating performance

To investigate the effect of workforce change on operating performance, we use operating performance *change* instead of operating performance *levels*, as the dependent variable in the regression analysis. In order to control for reverse causality between dependent and independent variables, in these regressions we use workforce *change* during the first post-takeover year as the

main independent variable and operating performance change three years after the takeover completion year as the dependent variable.

The results of these regressions are given in Table 6. The full sample regressions indicate that the workforce change variable is inversely related to operating performance change: 1% employment growth leads to a 0.07% smaller change in ROA. This means that greater workforce reductions are associated with more positive operating performance change, while higher workforce growth is associated with more negative performance change. The WFR regressions show that a 1% workforce reduction during the first post-takeover year leads to a 0.15% greater change in ROA after two years. The WFG regressions imply that the higher the workforce growth, the more negative the operating performance change: 1% workforce growth leads to a 0.09% smaller change in ROA. One interpretation of these results is that post-merger workforce reductions at least arrest further performance deterioration, whereas accelerated employment growth may negatively affect performance. Thus, these results support the hypothesis that workforce reductions positively contribute to operating performance change.

Table 3 Regressions explaining post-takeover performance change

Independent variables	Full sample	WFR	WFG	Full sample	WFR	WFG
Workforce change from t-1 to t+1	- 0.068***			- 0.086***		
Workforce reduction from t-1 to t+1		0.060			0.146**	
Workfroce growth from t-1 to t+1			- 0.090**			0.025
Premium	0.048**	0.049	0.028	0.042*	0.079**	- 0.001
Control firm performance	0.320***	0.374***	0.220***	0.316***	0.358***	0.340***
Relative size	- 0.003	0.004	- 0.014**	- 0.004	0.006	- 0.016**
Board composition	0.112**	- 0.095	- 0.046	- 0.092**	- 0.120*	- 0.019
Leverage	- 0.037	- 0.119*	0.045	- 0.012	- 0.126*	0.071
Hostility dummy	0.020	0.016	0.021	0.034*	0.022	- 0.010
Relatedness dummy	0.032**	0.041*	0.034	0.036**	0.091**	0.096***
Hostility dummy · Workforce change				0.061	- 0.026	0.017
Relatedness dummy · Workforce change				0.001	0.193**	- 0.291**
Constant	- 0.001	0.044	- 0.070	- 0.027	0.024	- 0.112**
F-stat	6.72	3.14	3.97	5.35	3.33	3.11
Adjusted R-square	0.19	0.14	0.15	0.15	0.19	0.27
Number of observations	181	104	79	186	103	79

Notes: The dependent variable is the ROA change three years after the merger completion year. Workforce change (reduction or growth) is the change one year after the merger completion year (change from t-1 to t+1). The estimation method is OLS, using

heteroscedasticity-robust standard errors (White, 1980). Significance levels: *p<0.1, **p<0.05; ***p<0.01. Appendix 9.2 provides the definitions of the variables.

Regarding the control variables, the full sample results show that the premium is positively associated with the change in operating performance: in acquisitions for which high premiums are paid operating performance decline is smaller. This is consistent with the view that acquirers pay high premiums for better-performing firms. However, further analysis shows that the premium may affect operating performance differently for different sub-groups. In the WFR sub-sample, the premium positively affects the change in operating performance, which is consistent with the full sample results. In contrast, in the WFG sub-sample, the premium is negatively associated with operating performance change, indicating that in this sub-sample paying a higher premium for the target firms leads to lower operating performance.

As expected, control firm performance change is positively associated with acquiring firm performance change in all models. The results show that high leverage leads to more negative performance change. Relative size is also inversely related to operating performance change in the WFG regressions: acquiring large firms affect performance change more negatively. The board composition variable is negatively associated with operating performance change.

The models that include dummy regressors and their interactions with the workforce change variable confirm the positive effect of workforce reductions on operating performance change. For example, in the WFR sub-sample a 1% workforce reduction leads to a 0.15% greater change in ROA. The interaction term coefficients indicate that the effect of workforce adjustments on operating performance is significantly different in related and unrelated acquisitions, while it is not significantly different for hostile versus friendly acquisitions. In the WFR sub-sample, a 1%

higher workforce reduction in unrelated acquisitions causes a 0.15% greater operating performance change, while in the related acquisitions this effect is 0.34% [= 0.146 + 0.193]. In the WFG sub-sample, 1% higher workforce growth causes a 0.27% [= 0.025 – 0.291] smaller operating performance change. Thus, in related acquisitions, workforce reductions lead to materialisation of post-merger synergy and positively contribute to operating performance change, while excessive workforce growth negatively affects performance change.

In sum, these results imply that post-merger workforce reductions positively affect firm performance. This conclusion contradicts the Krishnan and Park (2002) and Krishnan et al. (2007) results, which show that in related acquisitions excessive employee layoffs negatively affect operating performance.

1.5 Discussion

Does post-takeover performance deterioration lead to workforce adjustments? We fail to reject the hypothesis that post-takeover performance deterioration leads to workforce reductions, as there is significant positive association between the two variables, shown by both full sample and sub-sample regressions (Q2-H1). This evidence implies that acquirers take into consideration post-takeover performance change in downsizing decisions and confirms the view that such layoffs are undertaken for efficiency improvement purposes, as suggested by Conyon et al. (2002).

What are the consequences of post-takeover workforce adjustments for operating performance?

Firstly, in the univariate analysis, both benchmarks show that the WFG sub-group acquirers' performance declines significantly during the third post-takeover year, while the WFR sub-group

acquirers' performance does not differ significantly from the pre-takeover level. These results indicate that workforce reductions may halt further performance deterioration.

The full effect of employee layoffs might only be felt 2 to 3 years after downsizing (Palmon et al., 1997; Espahbodi et al., 2000; Perry and Shivdasani, 2005). Therefore we use performance change as a dependent variable and our results reveal an inverse relationship between workforce *change* and operating performance *change* (Q2-H2). This suggests that employee layoffs at least arrest further operating performance deterioration during post-takeover years: workforce reductions are associated with more positive operating performance changes, while higher workforce growth is associated with more negative operating performance change. The results indicate that the extent of post-merger workforce adjustments is greater in related acquisitions than in unrelated acquisitions. The interaction of the relatedness dummy with the workforce adjustment variable is significant in both the WFR and WFG models. For example, in the WFR sub-sample, a 1% employment reduction in related acquisitions leads to significantly better performance than a 1% employment reduction in unrelated acquisitions. Similarly, in the WFG sub-sample, accelerated employment growth hurts more acquirers who acquire firms in the same industry. This is consistent with the view that related acquisitions provide more synergy, facilitating a large reduction in labour demand in comparison to unrelated acquisitions.

In other words, using the operating performance *change* variable, we are not able to further support the hypothesis that excessive employee layoffs lead to operating performance deterioration, as suggested by Krishnan et al. (2007). Instead, the results indicate that workforce reductions contribute to positive operating performance change, while accelerated workforce growth may lead to steeper decline in operating performance.

1.6 Conclusions

This chapter investigates the role of post-merger performance deterioration in explaining workforce reductions. It also investigates whether post-merger employee layoffs arrest a declining in performance or whether they cause further performance deterioration. The results support the view that post-takeover workforce reductions are made in under-performing firms. The results also reveal that operating performance decline is smaller in the WFR sub-sample than in the WFG sub-sample. Both full sample and sub-sample regressions indicate that post-merger decline in operating performance may also contribute to the workforce reductions.

Using a US sample, Krishnan and Park (2002) and Krishnan et al. (2007) show that managers undertake excessive post-merger employee layoffs to cover high premiums paid to target shareholders, which may lead to subsequent firm performance deterioration. However, a counter-argument exists: a primary reason for downsizing is to improve operating performance. Therefore workforce change could be expected to positively affect operating performance. The objective of downsizing is to stop further performance deterioration and it may take some time to materialise the effect of downsizing. Therefore we hypothesise that there is an inverse relationship between workforce *change* and operating performance *change,* which implies that workforce reductions halt further performance deterioration, given the fact that takeovers in general lead to a decline in operating performance. In this regard, we have hypothesised that workforce reductions are associated with more positive operating performance change, while high workforce growth is associated with more negative operating performance change.

However, we could not generalise the Krishnan and Park (2002) and Krishnan et al. (2007) findings using a sample of UK acquisitions: the results suggest that workforce reductions do not

negatively affect operating performance. The results show that the need for performance improvement necessitates workforce reductions. So, it can be concluded that managers do not put shareholders' interests above the labour force's' interest. Managers can be seen as active participants in governance and make decisions to improve firm performance.

The results of the regression analysis show that there is an inverse relationship between workforce change and operating performance change: accelerated workforce growth leads to greater operating performance decline. Thus, this paper concludes that workforce reductions are associated with greater operating performance change. In brief, the results imply that post-merger employee layoffs contribute to materialising post-merger synergy and, thereby, positively affect firm performance.

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