

The Effects of Mergers on Company Employment in the USA and Europe*

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Abstract:

We systematically analyse the effects of mergers and acquisitions on the demand for labour in the USA and Europe. We do not find adverse effects of mergers on labour demand in the USA, however we do find negative effects in Europe of the order of –10% compared to pre-merger levels. We attribute this significant difference to more rigid labour markets in Europe than in the USA.

Keywords: Mergers and Acquisitions, Labour Demand, Restructuring, International Comparison

JEL Codes: G34, L2

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1. Introduction

The last two decades saw a dramatic increase in unemployment within the European Union (EU). The average unemployment rate peaked at around 11% in 1985 and is not much lower currently at between 8 and 9% (see OECD, 2000). Although the USA has also experienced a rise in unemployment over parts of this period, US unemployment never reached EU levels and, what is more, always returned to lower rates eventually. High labour adjustment costs in Europe have long been held responsible for this poor labour market performance.¹ The term “*Eurosclerosis*” was created.

Studies analysing the effects of adjustment costs on the demand for labour abound, and all find that the US labour market adjusts more quickly to shocks than its European or Japanese counterparts. For example, while there are differences across broad industrial sub-sectors and the adjustment of hours worked is quite similar in the USA and Germany, Abraham and Houseman (1989 and 1993) show that employment level adjustment is much faster in the US manufacturing sector than in Germany or Japan. Balakrishnan and Michelacci (2001) find that most differences in unemployment dynamics arise because of differences in responses to economic shocks. The US labour market is quicker to adjust than the EU labour markets (in the study these are the UK, German, French and Spanish markets).² Interestingly and perhaps surprisingly, the UK labour market adjusts slowest among the countries depicted, at least when the authors use their preferred specification.³ Finally, Hamermesh and Pfann (1996) compare studies based on firm level data and

¹ Labour turnover costs are many and diverse; they range from the costs of job search, screening, training, and firing; to negotiation costs, including the expected loss of profits due to the implementation of strike threats and work-to-rule activities (see Lindbeck and Snower, 1989). In this paper by analysing the effects of mergers and acquisitions on employment, we emphasize firing costs such as costs arising due to rules of collective dismissal involving e.g. advance notification of dismissals or non-negligible severance payments to laid off employees.

² For related papers using only US data, see Blanchard and Diamond (1989 and 1990).

³ The authors rationalize this result with the time period analysed (1972-1990), when labour markets in the UK were fairly rigid. Below, we have some more words to say about the UK.

conclude that the adjustment of employment in response to demand shocks is slower in Europe than in North America.

Therefore, the verdict seems clear: high labour adjustment costs in Europe prevent firms from reaching their optimal employment level in the aftermath of an economic shock, at least in the short run. An excess labour burden is the likely outcome. In this paper, we argue that high labour adjustment costs in Europe imply a testable implication for the effects of mergers and acquisitions on the demand for labour. If in the wake of mergers and acquisitions the adjustment of employment is facilitated (we will argue below, that this is quite plausible), “sclerotic” labour markets in Europe imply that mergers and acquisitions have differential effects on the demand for labour in the USA and Europe. In particular, we expect that the combined firm sheds (excess) labour after a merger by *more* in Europe than in the USA. This is so because US firms do not need (or need less) the restructuring effects (merits) of mergers and acquisitions to optimally adjust to shocks. US labour markets allow for a continuous adjustment of labour at low cost.⁴ In contrast, high adjustment costs of the workforce in Europe prevent firms from reaching the optimal employment level without renegeing on (explicit or implicit) contracts. Mergers and acquisitions are a major event in the life of a company and often go hand in hand with substantial restructuring and even closure of divisions within the combined entity. Incumbent target management is likely to be replaced and the new managerial team is less likely to be committed to upholding past contracts with stakeholders (Shleifer and Summers, 1988). We present evidence that European mergers are different from US mergers insofar as the demand for labour is reduced by more after a merger or acquisition in Europe than in the USA.⁵

⁴ An, admittedly extreme but nevertheless instructive, example of this are the layoffs of 5,000 people (app. 1.5% of the total workforce) by IBM in June 2002. According to press releases (*Der Standard*, 1 June 2002), these layoffs were *not* publicly announced. There were also no announcements of takeovers or restructurings by IBM.

⁵ The flip side is that necessary restructurings are sometimes delayed and insufficient. For example, Deutsche Telekom (DT), after suffering a record loss of 4.7 Bill Euro in 2001 and a projected loss of 5.5 Bill Euro in

Recent evidence by Conyon, Girma, Thompson and Wright (2002a, 2002b and 2002c, henceforth CGTW) indicates that mergers and acquisitions significantly reduce the demand for labour in the UK in the years following an acquisition. The authors interpret their results as being consistent with significant rationalization in the use of labour as firms reduce joint output and increase efficiency post-merger.

This paper provides a systematic analysis of the effects of mergers and acquisitions on the demand for labour in three countries/regions of the world, the USA, UK and Continental Europe. This allows us to test the above hypothesis and go beyond CGTW. Consistent with CGTW, we find a significant drop in employment post-merger in the UK, holding constant output as well as accounting for firm fixed effects. However, we do not find a significant reduction in labour demand in the USA, post-acquisition. The overall results for the USA even point to increased demand for labour (albeit insignificantly so). Similar to the overall results for the UK, Continental European mergers reduce the demand for labour. However, here we find interesting differences to the UK for some aspects of mergers such as the relatedness of acquirers' and targets' assets as measured by their industrial classification. In particular, we find that (similar to CGTW) related mergers reduce employment by more than unrelated mergers in the UK. However, this pattern is reversed when we look at Continental European mergers. Here, managers reduce employment by more after *unrelated* mergers than after related mergers. The difference in employment effects between UK related mergers from Continental European related mergers is significant at the 10% level. In contrast to both, UK and Continental European mergers, the effects of US mergers on labour demand appear independent of the relatedness

2002, announced a reduction of the total workforce by 22,000 or 8.5% until the *end of 2004*. According to Ron Sommer, then the CEO of DT, this reduction in the workforce "should be achieved without lay offs as in the past." One could speculate that if DT were the target of a takeover or incorporated in the USA, employment reduction would be much faster. Moreover, the union representatives on the supervisory board of DT insisted that the successor to Ron Sommer must come from within the firm. The reason was that they expected less employment reduction, since an insider would be less likely to revise the decisions she has approved of in the past.

of the assets involved. We also find differences in effects of tender offers as compared to other deals. These results underline the importance of institutions in determining the effects of mergers and acquisitions on employment, since labour markets are highly regulated and specific national institutions play a prominent role.

Previous studies of mergers' effects on employment neglect the fact that firms undertake multiple mergers and divestitures. We address these methodological shortcomings in the following ways. First, by tracking the entire *history* of mergers and acquisitions undertaken by the acquiring firm under consideration, we make sure that additional acquisitions of this firm do not artificially inflate acquiring firm employment figures.⁶ Second, by also collecting information on all divestitures of acquiring firms, we are able to control for divestiture activity of these firms. This gives us a more accurate estimate of the net effect of mergers and acquisitions on firm labour demand.⁷

The rest of the article is structured as follows. Section 2 provides the theoretical background and empirical evidence so far on the effects of mergers on labour demand. Section 3 presents our estimation strategy. Section 4 describes the database, Section 5 the regression results, and Section 6 discusses robustness checks. The last section concludes.

2. Theoretical background and empirical evidence

Employment protection laws vary significantly across countries by length of service, firm size, employee status (blue-collar/white collar). These differences have produced several stylised facts in the literature on employment protection (see e.g. OECD, 1996, 1997, 2000; Siebert, 1997; Nickell, 1997).

⁶ Take for example Siemens AG, which took over another firm in *each* of the years 1987-1998, however, we have only data for two of these targets. We have to exclude Siemens AG, therefore, from the analysis, since we would artificially attribute increased labour demand to these two mergers when in fact the increased employment of Siemens AG stems in part from the additional acquisitions.

⁷ Gugler, Mueller, Yurtoglu and Zulehner (2003) also account for the effects of additional mergers and of divestitures in their analysis of the effects of mergers on profits and sales.

- (1) The USA has the least restrictive employment protection rules. Several studies (see the introduction) and statistics underline this. For example, the OECD, 2000, p. 57, ranks the USA as the least restrictive country among 27 OECD countries with respect to overall protection against dismissals of regular employees.
- (2) European countries, in particular Southern European countries along with Germany and France, stand out for having relatively strict employment protection. Among the European countries the UK and the Netherlands appear to have the least restrictive employment regulation. However, the UK has very strict regulation concerning collective dismissals. For example, while Germany defines a collective dismissal as one where more than 30 employees are laid off within 30 days, the UK defines a collective dismissal as one where more than 20 workers are laid off within 90 days. To compare, in case of layoff (plant closure), the USA defines a collective dismissal as one where more than 500 (50) workers lose their jobs, or 50-499 workers if they make up at least one third of the workforce over a period of 30 days. Moreover, the consequences of a collective dismissal appear to be more stringent in the UK than in Germany (or the USA). While in Germany only a consultation with the works council and a notification of the local employment office is required, companies in the UK have the duty to inform and consult with the recognised trade union as well as make a notification to the Department of Trade and Industry. Moreover, Freeman (1998, p.16) states that while Mrs. Thatcher's legislation to curb union excesses in the UK helps account for the drop in union density in the UK, the legislation is "small" in the sense that it did not seek to change the essential features of British labour relations.⁸

⁸ There was also not much wage restraint in the UK nor was labour market performance as measured e.g. by the unemployment rate much better or different from the experience of other EU countries. Unit labour costs increased by an annual average rate of 4.4% over the period 1987-1997 in the UK as compared to 2.9% in the

(3) Stricter employment protection laws are associated with lower turnover in the labour market, with both periods of work and unemployment spells lasting longer. Here again doubt must be expressed that the UK has a very flexible labour market. OECD (1997, p.163) reports that the UK has the second *lowest* job turnover rate⁹ (15.3%) over the period 1985-91.¹⁰ To compare, the USA has a job turnover rate of 23.4% and Germany one of 16.5%.

This discussion leads us to expect that European labour markets are much more highly regulated than their counterparts in the USA. It also casts doubt on the notion that the UK labour market is substantially more flexible than other European labour markets.

In general, the a priori predictions on the effects of mergers on labour demand are ambiguous. A merger may lead to a reduction in output, e.g. because the merger increased market power or the technologies of the acquiring and acquired company exhibit increasing returns to scale, and a consecutive reduction in employment. A merger may, on the other hand, lead to an increase in output, e.g. because the merger significantly increased the efficiency of the combined firm, led to product improvements and demand shifts, and so on. Thus, the employment of the combined entity may rise or fall relative to the sum of the pre-merger employment levels.¹¹

If, however, mergers are used as a general device to restore a firm's optimal employment level, we would expect *differential* effects depending on labour market institutions. While ambiguities exist whether high labour adjustment costs increase the unemployment *level*, it seems safe to argue that the speed of *adjustment* with which firms

EU and 2.3% in the USA (see OECD, 2000, p. 16). Nickell, 1997, p. 57, states for the period 1989-94 that "Britain ... has an average unemployment rate higher than half of its European neighbors."

⁹ Job turnover is the sum of over-the-year changes in employment levels across all establishments as a proportion of total employment, and is one indicator of the extent of change in the external labour market.

¹⁰ The studies in Barrell (1994) support this view.

¹¹ Predictions are also ambiguous when one assumes that managers maximize something else than profits, e.g. sales or growth.

respond to shocks decreases with adjustment costs.¹² High labour adjustment costs makes hiring a worker a somewhat irreversible decision. Therefore, it appears likely that in countries with very rigid labour markets some firms carry excess labour with them. Fewer such firms are expected to exist in countries whose labour markets allow quick adjustment of the workforce. Mergers and acquisitions are an effective means to achieve a desired restructuring, since the managerial team is likely to be new and therefore less likely to be committed to upholding past contracts with stakeholders (Shleifer and Summers, 1988). Since Europe has more rigid labour markets than the USA, mergers may be used as a device to reduce excess labour. Thus, we expect that the demand for labour is reduced by *more* after a merger or acquisition in Europe than in the USA.¹³

Note, that for this prediction to be valid, it is not important whether the excess labour employed is the result of “implicit” or “explicit” contracts. If implicit contracts are more sustainable in more rigid labour markets, a potential for ex-post expropriation is created. Shleifer and Summers (1988), in particular, express the concern that hostile takeovers can lead to a “breach of trust”. A raider may break implicit contracts if it is in its interest ex post (i.e. after firm-specific investments have been made), and lay off people or reduce their wages. Rigid labour markets also provide protection to insider employees who did not necessarily build up firm-specific human capital, and merger activity also offers an opportunity for firms to renegotiate these labour contracts.¹⁴

¹² See Bertola (1990), who argues that employment appears more stable and unemployment more *persistent* in high job security countries, while no strong relationship emerges between job security and unemployment levels. See also Modesto and Thomas (2001), Bentolila and Bertola (1990), and Bentolila and Saint-Paul (1994) among others. However, see Boeri (1999) emphasizing the importance of job-to-job shifts and “short-term” jobs in Europe as a means to attain flexibility in the presence of tight labour market regulations.

¹³ An example is the planned privatisation of the Austrian Postbus AG in 2002. The union fears that a third of the workforce of Postbus AG will be laid off in case of privatisation and currently tries to prevent it.

¹⁴ It should be noted, however, that the efficiency consequences may differ. If stakeholders anticipate that (particularly hostile) takeovers increase the probability that they are expropriated ex post, they provide a sub-optimal level of relation-specific investment ex ante. “At least in part, therefore, the gains are wealth redistributing and not wealth creating.” (Shleifer and Summers, 1988, 42). If a merger is merely used to restore optimal employment level and no other inefficiencies are involved, on the other hand, the merger is likely to be efficiency enhancing.

Evidence on the impact of mergers on employment is extremely limited, especially outside the Anglo-Saxon world.

Brown and Medoff (1988) analyse a large sample of firms in the state of Michigan for the period 1978-1984 and find that firms that are part of “assets only” acquisitions have wages about 5% higher but employment about 5% lower than they would otherwise be. “True mergers” are associated with wage declines of about 4% and employment *growth* of about 2%.

Bhagat et al. (1990) examine 62 hostile takeovers in the USA between 1984 and 1986 and find that in 28 of the 62 cases workers were laid off after the takeover involving 5.7% of the work forces of these firms. These redundancies account for 10 to 20 percent of the premium paid.

Lichtenberg and Siegel (1992) report for US manufacturing data that job losses after mergers are largely confined to central office staff. McGuckin et al. (1995) find increased employment in acquired plants and insignificant effects in firm-level regressions for the USA. In a more recent study, McGuckin and Nguyen (2000) also conclude that ownership changes are not a primary vehicle for cuts in employment and wages, or closing plants. Instead, ownership changes are associated with increases in employment for the entire US manufacturing sector for the 1977-1987 period.

As already mentioned, CGTW (2002a, 2002b and 2002c) find for the UK between 1967 and 1996 that mergers and acquisitions significantly reduced the demand for labour in the years following an acquisition. The negative effects on employment are particularly pronounced for related and hostile transactions.

We are not aware of any systematic studies of the effects of mergers on employment in Continental Europe nor in other parts of the world.

3. Estimation strategy

If a merger results in an optimal employment level different from the total employment of the merging firms, then a profit maximising firm will adjust its labour force via an active policy of hiring or firing. Dynamic models of labour demand place great emphasis on the costs of this adjustment process.

While a dynamic labour demand function can be specified in several ways, we employ the following equation assuming that output constrained firms face continuous quadratic adjustment costs and use a Cobb-Douglas technology:

$$l_{it} = \alpha l_{it-1} + \beta_1 q_{it} + \beta_2 q_{it-1} + \delta_1 (w/c)_{it} + \delta_2 (w/c)_{it-1} + \gamma_t D_t + f_i + \varepsilon_{it} \quad (1)$$

where l_{it} , $(w/c)_{it}$ and q_{it} denote the logarithms of employment, real wages relative to user cost of capital and real output of firm i in period t . We proxy real output by real total sales. D_t are a set of time dummies to account for technical progress and f_i isolates firm specific fixed effects¹⁵.

Our method of estimating the impact of mergers on employment is by the introduction of dummy variables. For example, to test whether there are differences in the effects of mergers on employment between US and European mergers, we estimate the following regression equation

$$l_{it} = \alpha l_{it-1} + \beta_1 q_{it} + \beta_2 q_{it-1} + \lambda_0 U_{it} + \lambda_1 E_{it} + \delta_0 DU_{it} + \delta_1 DE_{it} + \gamma_t D_t + f_i + \varepsilon_{it} \quad (2)$$

where $U_{it} = 1$ if the country of incorporation of firm i taking over another firm in t is the USA, and zero elsewhere; and $E_{it} = 1$ if the country of incorporation of firm i taking over another firm in t is a (Western) European country, and zero elsewhere. Note that employment and sales are defined as the sum of acquiring firm and target company

¹⁵ We sketch the major steps in the derivation of (1) in the appendix. See, Bresson, Kramarz and Sevestre (1996) or Nickell (1984) for a full exposition.

employment (sales) before the merger and as employment (sales) of the acquiring firm post-merger. That is, the data series used apply to the combined entity, which controls for any spurious impact of merger on employment.

The key statistics of interest are the λ 's measuring the contemporaneous impact of mergers on labour demand of the combined entity in (approximately) percentage terms relative to the sum of the pre-merger employment levels of acquirer and target. We deliberately focus on the short-run effects, since they capture the immediate restructuring effects of mergers. This should disentangle restructuring effects from medium to longer run product market effects.¹⁶

Since our main motivation is to see whether rigid labour markets in Europe lead to larger restructuring effects of mergers, we stress the *difference* in the λ 's across countries/country groups. We hypothesize that since Europe has more rigid labour markets than the USA and if mergers are used as a means of restructuring, the demand for labour is reduced by more after a merger or acquisition in Europe than in the USA, i.e. $\widehat{\lambda}_0 > \widehat{\lambda}_1$. Note, that even if the λ 's are estimated with bias¹⁷, the estimated differences in effects $\widehat{\lambda}_0 - \widehat{\lambda}_1$ are unbiased estimates of the true differences, if the bias is the same across countries/groups of countries.

Equation (2) controls for firm fixed effects (f_i) as well as for year fixed effects (D_t). The latter allow for differential employment growth over the business cycle. Fixed firm effects subtract firm-specific means from all variables removing all time invariant determinants of labour demand growth. Thus, fixed firm effects leave the merger dummy variables to pick up the effects of within firm variation in merger activity on employment.

¹⁶ There are a number of arguments suggesting that product market effects take time, for example, switching costs, brand loyalty, delayed reaction of rivals, entry etc. (see Gugler et al., 2003).

¹⁷ Say, because the within firm variation in merger activity is (partially) endogenously determined, or because merger years are a self-selected sample of observations. However, GMM estimation should at least in part correct for that.

Unlike the literature on the effects of mergers on employment so far, we control for divestiture activity by introducing dummy variables taking on the value one if acquiring firm i made a divestiture in year t , and zero if it did not. In the example of equation (2), $DU_{it} = 1$ if the US firm i makes a divestiture in t , and zero elsewhere, and $DE_{it} = 1$ if the European firm i makes a divestiture in t , and zero elsewhere. Note that we again control for the entire divestiture history of the firm. We introduce dummy variables for divestiture activity instead of subtracting the employment (sales) of the divested units from the combined entity, since most divestitures are spin or split offs of divisions of a company and these data are not available. By introducing divestiture dummies we correct for the average effects of divestitures on employment of the combined entity, leaving the λ 's to measure the net effect of merger activity.

Equation (2) can be modified by introducing appropriately defined dummy variables to test for the effects of mergers in other geographical regions of the world or various additional aspects of merger activity such as the relatedness of assets, the hostility of the transaction etc.

Equation (2) contains a lagged dependent variable and OLS would be inconsistent in the presence of unobserved firm-specific effects. Therefore, we estimate it by a systems GMM estimator developed by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998).¹⁸ This estimator eliminates firm effects by first-differencing as well as controls for possible endogeneity of current explanatory variables. Endogenous variables lagged two or more periods will be valid instruments provided there is no second-order autocorrelation in the first-differenced idiosyncratic error terms. We present tests for autocorrelations and the Sargan test of over-identifying restrictions in the tables that follow.

The next section presents the database used as well as summary statistics.

¹⁸ See Anderson and Hsiao (1982) for a different consistent estimator of the parameters of dynamic panel models with fixed effects.

4. The database

Our principal source of data is the *Global Mergers and Acquisitions* database of *Thompson Financial Securities Data (TFSD)*. This company collects merger and spin-off data using a variety of sources such as financial newspapers, Reuters Textline, the Wall Street Journal, Dow Jones etc. The database covers all transactions valued at US \$ 1 million or more. We define a merger as a transaction where more than 50 percent of the equity of a target firm is acquired. We include also deals where a part of a company, say in the form of a division, was sold to another company.¹⁹ During the period 1981 to 1998, there were 200,480 announcements of such M&A transactions. Our merger data for the United States begin in the late 1970s, for all other countries in the mid-eighties.

From the more than 200,000 announced mergers across the world, 140,289 were actually completed with almost half of these taking place in the United States. The samples used for our analysis are much smaller than these numbers might indicate for the following reasons. First, acquiring company employment and sales data stem from the *Global Vantage/Compustat* database. Out of the 140,000 completed mergers we could match 31,696 made by 9,092 acquiring firms to one of these databases over the period 1987-1998.²⁰ Missing employment or sales data for acquiring firms and/or targets further reduces the sample to 6,206 mergers. Some acquiring companies acquire more than one target in a given year, and since our balance sheet information for acquiring companies is on a yearly basis, we aggregate the relevant variables of these targets. This further reduces the merger sample to 4,106 merger years. Finally, we take great care in tracking the whole merger

¹⁹ Symmetrically we define a spin-, split- or sell-off as a transaction where more than 50% of the equity are disposed off. We use the term "divestitures" interchangeably.

²⁰ That is, on average acquiring firms acquired more than three firms during the 12 year period 1987-1998. UK firms acquired on average 3.4 firms. CGTW (2002a) report an average of 1.4 firms for their sample of UK firms over the period 1967-96. It is likely, therefore, that CGTW (2002a) did not account for all mergers occurring, and their estimates are likely to be biased in favour of finding *positive* effects of mergers on labour demand. CGTW (2002a) did also not account for divestitures.

history of the firm. This is important since if one does not account for multiple mergers or acquisitions of a single company over time, serious bias is introduced. To be included in the final sample, therefore, we require that *all* data on *all* targets are available from year $t-1$ to $t+3$ with merger year t . This further reduces the final sample to 646 mergers made by 550 acquiring firms for which we have the full set of data.

The control sample is the whole universe of *Global Vantage* firms that did not make an acquisition over the period 1987-1998. Since we account for (almost) all mergers that happened during this period, we are confident that this control sample is as “clean” as possible.²¹ In total, we include 10,282 firms in the estimation. Our dummy variable that controls for divestitures is defined for 1,577 of these firms making 2,332 divestitures.

It should be noted here that our criteria for inclusion of mergers and divestitures in the final sample are solely based on data availability. Our databases also include unquoted targets as well as divested divisions.²² The sample is therefore as representative for the underlying population of mergers and divestitures as feasible with commercially available databases.

Table 1 presents a breakdown of mergers by year, some specific aspects of mergers, and by country. From the 646 analysed mergers, 364 (56.3%) are undertaken by US acquiring firms, 104 by UK companies and the remaining 178 by firms of Continental European origin. There are 65 mergers undertaken by German firms, for which sample size allows separate estimates below. Similar to CGTW (2002a), mergers were classified into related and unrelated depending on whether the acquired and acquiring firms belonged to the same 2-digit SIC industrial code. Some 333 mergers (51.5%) fell into the related category. Interestingly, more than 60% of UK mergers were classified as unrelated as compared to only 43.7% of US mergers. We define a transaction as “hostile” if the

²¹ As an additional check, we eliminate all firms in the control group that experienced fixed assets growth of more than 100% in a given year.

²² They are, however, underrepresented as compared to quoted targets or regular mergers.

incumbent target board rejected the first bid by the subsequently successful acquirer. This is a very strict requirement, since it is a very risky strategy for incumbent management to formally reject a bid. Thus, only 23 deals are so classified as hostile. While 20% of all mergers are tender offers, more than a third of UK transactions are tender offers, some of which may bear a hostile element.²³ Finally, 26.7% of all mergers are cross border deals. Nearly fifty percent of Continental European mergers are cross-border, while only 18.1% of US mergers are cross border deals.

Table 2 presents basic statistics on the number of employees as well as on absolute levels of labour productivity (sales/worker) and industry/country adjusted labour productivity. Panel A shows, that on average, acquiring firms employ 13,149 people. Their targets employ around a fifth of this workforce (2,617). Both in absolute terms and relative to their acquiring firms, UK targets are largest (4,116 employees or 34.2%). Strikingly, UK targets involved in related mergers are *not* significantly smaller than their acquirers.

Panel B suggests that overall and in the subsample of UK mergers, targets achieve significantly higher labour productivity than their acquirers. Targets of related mergers exhibit significantly higher labour productivity than targets of unrelated mergers.

If mergers are used as a restructuring device to reduce excess labour, one would expect a rise in the labour productivity of the acquiring firm in the year of the merger and possibly in following years. Panel C presents summary statistics on industry/country-adjusted labour productivity in the years $t-1$ until $t+3$. Our reference is the average labour productivity of *non*-merging firms in the country and two-digit industry of the acquiring firm in years $t-1$ until $t+3$. Adjusted labour productivity of US companies is insignificantly different from one in all years from $t-1$ until $t+3$: US companies do not appear to use mergers to achieve dramatic increases in labour productivity, on average. In contrast,

²³ A tender offer is a formal offer of determined duration to acquire a public company's shares made to equity holders. The offer is often conditioned upon certain requirements such as a minimum number of shares being tendered.

European companies start out with relative labour productivity around 9% less than their industry peers in year $t-1$ (this difference is significant at the 5% level), and use the merger to lift labour productivity to the average level of non-merging firms in the same industry. While the differences to the control group are insignificant, labour productivity remains below that of industry peers until $t+3$, however. There is no difference in adjusted productivity between European and US acquiring firms from year t onwards.

5. The results

Table 3 presents our estimation results for equation (2) using the Arellano/Bond one step *GMM* estimator. The *GMM* technique corrects for simultaneity and firm effects biases. The Sargan tests do not suggest rejection of the overidentifying restrictions at conventional levels for either specification estimated. While there is evidence of first order serial correlation in the residuals, the AR(2) test statistics reveal absence of second order serial correlation in the first differenced errors and thus that the instruments are valid.

All estimations in Table 3 confirm the predictions of models of dynamic labour demand. Increases in sales cause the level of derived labour demand to increase, the positive and significant coefficient on the lagged dependent variable implies inertia in firm employment. As already mentioned, the pattern of the wage coefficients for the subsample of firms with wage data are also consistent with the models of dynamic labour demand (not presented in Table 3 but available upon request).

Estimation (1) in Panel A of Table 3 includes a single merger variable, *Merger(t)*, a dummy variable equal to one if the firm undertook a merger in year t and zero else, as well as a single divestiture variable, *Divest(t)*, a dummy variable equal to one if the firm divested a part in year t and zero else. We estimate a significant drop in labour demand of 2.9% of the combined entity relative to the sum of the pre-merger employment levels of the

acquiring firm and the acquired firm in the year following a merger. Divestitures cannot be responsible for this result, since we control for their impact on employment.

Estimation (2) defines *Merger(t)* for the USA and Europe, separately. While mergers in the USA leave derived labour demand virtually constant (the coefficient is even positive albeit insignificant), merger activity reduces employment in Europe by 10.0% ($z = 5.39$). More or larger divestitures in Europe cannot be responsible for this result, since we correct for their differential impact. Interestingly, not only are the effects of mergers significantly different in the USA from Europe, so too are the coefficients on *Divest(t)* (see Panel B of Table 3).

The same picture emerges when we further differentiate among US, UK and Continental European mergers and divestitures in Estimation (3), or if we differentiate among the USA, the UK, Germany and the rest of Continental Europe in Estimation (4). US mergers are different from their European counterparts as far as their effects on labour demand are concerned. Interestingly, UK mergers reduce derived labour demand by most, namely by 12.4% ($z = 4.63$), while Continental European mergers reduce labour demand by 7.9% ($z = 3.15$). German mergers are not different from the rest of Continental European mergers. Continental European divestitures have similar effects as US divestitures, but they are significantly different from UK divestitures.

Table 4 presents further results on specific aspects of merger activity. Since results on German and the rest of Continental European mergers were very similar, we consider only a split between the USA, UK and Continental Europe (where sample size allowed this). The estimations in Table 4 again include but do not report the dummies on divestiture activity.

Estimation (1) differentiates between related and unrelated mergers within the three country groups. Neither related nor unrelated mergers reduce employment in the USA.

Strikingly, UK related mergers reduce employment by *more* than unrelated mergers (similar to CGTW, 2002a), while Continental European related mergers reduce employment by *less* than unrelated mergers. The effects of related mergers in the UK are significantly different from the effects of related mergers in Continental Europe at the 6.5% level of significance.

Estimation (2) shows that outright hostile takeovers have a more adverse effect on labour demand than more friendly transactions, however due to the small number of hostile transactions the coefficient is insignificant. Estimation (3) differentiates between tender offers and other deals. Tender offers can be assumed to bear a larger element of hostility than other deals.²⁴ Tender offers have a significantly different effect in the USA than other mergers. Their effect on labour demand is very similar (around -8%) in the “market-based” systems of the USA and UK. This is consistent with the “breach-of-trust” hypothesis of Shleifer and Summers (1988). The effects of non-tender offers in the UK and Continental Europe are significantly different at the 8.5% level of significance.

Finally, Estimation (4) differentiates between domestic and cross border deals. While no differences are significant, domestic mergers reduce employment by much more than cross border deals made by UK acquiring firms (-13.7% versus -8.5%).²⁵

6. Robustness

Since we lack data for wages and the user cost of capital on a comparable international basis for around 50% of the merger sample, we presented the main results excluding them

²⁴ Schwert (2000) considers unnegotiated tender offers as a measure of the hostility of US deals. He also argues that bidders are more likely to be perceived as hostile when they use tender offers rather than merger proposals.

²⁵ Indeed, the largest negative labour demand effects are obtained for related AND domestic mergers in the UK (-18.6%; $z = 3.90$). Given the small sample size, the coefficient is statistically significantly different from other mergers in the UK only at the 11.1% level of significance.

as in equation (2).²⁶ This implicitly assumes that the difference between firms in the wage to capital cost ratio remains constant over time, and subsumes its effects under f_i . However, for a sub-sample of 299 mergers we have average wages, defined as total expenditures on employees divided by total employment. The coefficients on the logarithms of average wages in period t and $t-1$ take on the coefficients -0.31 and 0.11, which is the expected negative/positive pattern. The t-values indicate significance at the 1% level or better. More importantly, none of our inferences on the effects of mergers is altered by the inclusion of average wages.

We want to explain the effects of mergers on labour demand by differences in adjustment costs across countries. It is natural to assume, therefore, that the average speeds of adjustment, the α 's in equation (2), differ across countries. More generally, country-specific parameter heterogeneity may arise in equation (2). Therefore, we estimate (2) separately for the countries/country groups. While the α and β parameters appear to differ across countries, this parameter heterogeneity does not change our main conclusions on the effects of mergers.

7. Conclusions

Large public concern has been expressed about the influence of merger and takeover waves on the welfare of employees. Do they lose from takeovers?

We analyse this question using a large sample of mergers and acquisitions from the USA and Europe. We do *not* find significantly adverse effects of mergers on labour demand in the USA, on average. However, European mergers significantly reduce the demand for labour by around 10% on average. This is consistent with mergers being used as a

²⁶ Interestingly, the Global Vantage database lacks the information on employee expenditures predominantly for *US* companies and not for European companies, since US companies are not obliged to report this information, whereas for most other variables the reverse is the case.

restructuring device in “sclerotic” European labour markets. Mergers need not be used as a vehicle to restore optimum employment in the USA, since company managers can do so at any time at fairly low cost. The only category of mergers that also reduce labour demand in the USA is takeovers via tender offers. This is consistent with a “breach of trust” hypothesis of mergers’ effects on labour.

The paper reports interesting additional evidence on the effects of mergers on labour demand. UK acquiring firms reduce their demand for labour after related mergers by more than Continental European acquirers. The sharpest decline in labour demand was witnessed after domestic and related mergers in the UK. Cross border deals are not significantly different from domestic deals what concerns their effects on employment.

Finally, a methodological contribution of this paper is the simultaneous consideration of the whole merger and divestiture histories of the acquiring firm. Studies that fail to account for this introduce serious bias.

This paper reports on a neglected issue in merger analysis: the role of mergers as a restructuring device. Mergers enable companies to reduce what they view as excess labour in otherwise rigid labour markets. At least some mergers may therefore be viewed as the optimal endogenous response to high labour adjustment costs.

Appendix: Derivation of the labour demand function

We follow Bresson et al. (1996) and assume that firms are output constrained, have a Cobb-Douglas technology, and face quadratic adjustment functions. Firms determine the path of their future employment by minimizing the expected discounted value of their costs

$$(A.1) C_t = E_t \sum_{s=0}^{\infty} \rho^s \left[c_{t+s} K_{t+s} + w_{t+s} L_{t+s} + \frac{d}{2} (\Delta L_{t+s})^2 + \frac{e}{2} (\Delta K_{t+s})^2 \right] \quad \forall t$$

subject to

$$(A.2) Q_{t+s} = g(K_{t+s}, L_{t+s}) \quad \forall s$$

where c_t is the user cost of capital, w_t is the wage rate, and d and e define the quadratic adjustment costs. $E_t[\cdot]$, ρ , and Δ denote the mathematical expectation given the information set available to the firm at period t , the discount rate, and the first-differences operator, respectively. The first-order conditions (Euler equations) for each input are

$$(A.3) \quad E_t \left(-\rho d(L_{t+s+1} - L_{t+s}) + d(L_{t+s} - L_{t+s-1}) + w_{t+s} + \lambda_{t+s} \frac{\partial g}{\partial L_{t+s}} \right) = 0 \quad \forall s$$

for employment and

$$(A.4) \quad E_t \left(-\rho d(K_{t+s+1} - K_{t+s}) + d(K_{t+s} - K_{t+s-1}) + c_{t+s} + \lambda_{t+s} \frac{\partial g}{\partial K_{t+s}} \right) = 0 \quad \forall s$$

for capital.

One can solve this model by working in the neighbourhood of the long-run equilibrium, i.e., where $e=d=0$. The Euler equations can then be written as

$$(A.5) \quad \left(\frac{\partial g}{\partial L_t} / \frac{\partial g}{\partial K_t} \right)^* = \frac{w_t}{c_t}$$

After linearization of g around the long-run equilibrium,

$$(A.6) \quad Q_t - Q_t^* = \frac{\partial g}{\partial L_t} (L_t - L_t^*) + \frac{\partial g}{\partial K_t} (K_t - K_t^*)$$

we obtain given that at the long-run equilibrium $Q_t - Q_t^* = 0$,

$$(A.7) \quad K_t = K_t^* - \left(\frac{w_t}{c_t} \right) (L_t - L_t^*).$$

One can now derive the optimal path for employment using (A.2), (A.3), and (A.5) as (see Nickell, 1984)

$$(A.8) \quad L_t = \mu L_{t-1} + (1-\mu)(1-\alpha\mu) \sum_{s=0}^{\infty} (\alpha\mu)^s L_{t+s}^*$$

A log approximation to (A.8) can be written as

$$(A.9) \quad \text{Log}(L_t) = \mu \text{Log}(L_{t-1}) + (1-\mu)(1-\alpha\mu) \sum_{s=0}^{\infty} (\alpha\mu)^s \text{Log}(L_{t+s}^*)$$

The expression of the desired levels of employment, L_{t+s}^* , can then be derived from the solution of the firm's optimisation program without adjustment costs. In our context, this depends on the expected production, Q_t^* , on the expected factor price ratio, $(w_t/c_t)^*$, and on technological progress represented by time dummies, D_t ,

$$(A.10) \text{Log} L_{t+s}^* = a_1 \text{Log} Q_{t+s}^* + a_2 \text{Log} \left(\frac{w}{c} \right)_{t+s}^* + a_{3,t+s} D_{t+s} + a_4 + \varepsilon_{t+s}$$

Our basic equation (1) follows after assuming that the exogenous factors Q_{t+s} and $(w/c)_{t+s}$ follow an AR(2) process (see Bresson et al. 1996, p. 668, which details the derivation).

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Table 1: Sample composition: Number of mergersPanel A: By year

Year	USA	UK	Continental Europe	Total
87	31	2	0	33
88	28	5	0	33
89	29	4	6	39
90	18	8	6	32
91	15	3	5	23
92	14	2	6	22
93	43	14	12	69
94	36	14	33	83
95	32	15	26	73
96	42	15	28	85
97	43	8	16	67
98	33	14	40	87
Total	364	104	178	646

Panel B: By specific aspects of mergers

Related	205	41	87	333
Unrelated	159	63	91	313
Friendly	350	98	175	623
Hostile	14	6	3	23
No tender	296	66	155	517
Tender	68	38	23	129
Domestic	298	82	94	474
Cross border	66	22	84	172

Panel C: By country

Luxemburg	2
Austria	4
Norway	4
Denmark	5
Spain	5
Finland	5
Ireland	6
Italy	8
Belgium	10
France	12
Netherlands	16
Sweden	16
Switzerland	20
Germany	65
UK	104
USA	364

Table 2: Summary statistics: Means

	Acquiring firm (A)	Target (T)	T/A	Difference significant? (10% level)
<u>Panel A: Number of employees</u>				
All	13,149	2,617	19.9%	Yes
USA	12,199	2,173	17.8%	Yes
UK	12,026	4,116	34.2%	Yes
Cont. Europe	15,749	2,648	16.8%	Yes
<u>Related mergers</u>				
All	12,605	3,041	24.1%	Yes
USA	11,001	2,703	24.6%	Yes
UK	10,666	6,660	62.4%	No
Cont. Europe	17,298	2,133	12.3%	Yes
<u>Unrelated mergers</u>				
All	13,729	2,166	15.8%	Yes
USA	13,744	1,491	10.8%	Yes
UK	12,911	2,460	19.1%	Yes
Cont. Europe	14,268	3,141	22.0%	Yes
<u>Panel B: Labour productivity</u>				
All	0.226	0.272	120.3%	Yes
USA	0.243	0.274	113.1%	No
UK	0.200	0.290	144.8%	Yes
Cont. Europe	0.171	0.230	134.5%	No
<u>Related mergers</u>				
All	0.232	0.311	134.1%	Yes
USA	0.239	0.307	128.5%	Yes
UK	0.250	0.366	146.6%	No
Cont. Europe	0.165	0.274	166.2%	No
<u>Unrelated mergers</u>				
All	0.218	0.227	103.9%	No
USA	0.247	0.229	92.5%	No
UK	0.169	0.242	143.1%	No
Cont. Europe	0.177	0.191	108.3%	No
<u>Panel C: Industry-country adjusted labour productivity</u>				
Year	USA	Europe		
t-1	1.022	0.909		Yes
T	0.985	0.968		No
t+1	1.025	0.984		No
t+2	1.010	0.961		No
t+3	1.018	0.973		No

Note: Number of employees is the total average annual number of employees. Labour productivity is defined as total sales per worker in 1995 Mio USD. Industry-country adjusted labour productivity is the ratio of acquiring firm labour productivity to the average labour productivity of non-merging firms in the same country and two-digit industry of the acquiring firm.

Table 3: Basic results

Panel A: GMM estimates for equation (2)

Dependent variable: $\ln(\text{Employment}) (t)$

	Coef	z-value	Coef	z-value	Coef	z-value	Coef	z-value
$\ln(\text{Employment}) (t-1)$	0.341	8.61	0.345	8.69	0.341	8.59	0.341	8.58
$\ln(\text{Output}) (t)$	0.347	43.41	0.346	43.16	0.347	43.35	0.347	43.35
$\ln(\text{Output}) (t-1)$	-0.045	-3.07	-0.047	-3.17	-0.045	-3.06	-0.045	-3.06
<i>Merger</i> (t)	-0.029	-2.74						
<i>Divest</i> (t)	-0.050	-6.21						
<i>Merger USA</i> (t)			0.010	0.73				
<i>Merger Europe</i> (t)			-0.100	-5.39				
<i>Divest USA</i> (t)			-0.062	-6.50				
<i>Divest Europe</i> (t)			-0.022	-1.46				
<i>Merger USA</i> (t)					0.010	0.75		
<i>Merger UK</i> (t)					-0.124	-4.63		
<i>Merger CEU</i> (t)					-0.079	-3.15		
<i>Divest USA</i> (t)					-0.062	-6.49		
<i>Divest UK</i> (t)					0.013	0.59		
<i>Divest CEU</i> (t)					-0.054	-2.61		
<i>Merger USA</i> (t)							0.010	0.75
<i>Merger UK</i> (t)							-0.124	-4.63
<i>Merger Germany</i> (t)							-0.076	-1.79
<i>Merger CEUwG</i> (t)							-0.081	-2.63
<i>Divest USA</i> (t)							-0.062	-6.49
<i>Divest UK</i> (t)							0.013	0.59
<i>Divest Germany</i> (t)							-0.094	-2.29
<i>Divest CEUwG</i> (t)							-0.040	-1.66
Sargan test	0.41		0.45		0.42		0.47	
AR(1)	0.00		0.00		0.00		0.00	
AR(2)	0.77		0.79		0.75		0.68	

Note: The total number of firms in the estimation is 10,282; the total number of firms making mergers is 550; the total number of mergers is 646; the total number of firms making divestitures is 1,577; the total number of divestitures is 2,332; the total number of observations is 48,363. All regressions include a full set of time and firm dummies. CEU is continental Europe, CEUwG is continental Europe without Germany. The estimation method is one-step GMM. "Sargan test" is the p-value of a Sargan-Hansen test of overidentifying restrictions; AR(k) is the p-value of a test that the average autocovariance in residuals of order k is zero. Instruments include lagged levels of the dependent and the predetermined variables dated $t-2$ or earlier.

Panel B: Chi-squared tests of differences in merger and divestiture impact (p-values)

	<u>Merger</u>	<u>Divestiture</u>
USA-Europe	0.000	0.024
USA-UK	0.000	0.002
USA-CEU	0.002	0.741
USA-DEU	0.054	0.448
USA-CEUwG	0.007	0.404
UK-CEU	0.213	0.025
UK-DEU	0.340	0.021
UK-CEUwG	0.283	0.102
Germany-CEUwG	0.936	0.260

Table 4: Specific aspects of merger activity

Panel A: GMM estimates for equation (2)

Dependent variable: $\ln(\text{Employment}) (t)$

	Coef	z-value	Coef	z-value	Coef	z-value	Coef	z-value
<i>ln(Employment) (t-1)</i>	0.342	8.60	0.341	8.59	0.348	8.66	0.341	8.60
<i>ln(Output) (t)</i>	0.347	43.27	0.347	43.23	0.346	42.64	0.347	43.33
<i>ln(Output) (t-1)</i>	-0.046	-3.07	-0.045	-3.06	-0.048	-3.19	-0.045	-3.07
<i>Related Merger USA(t)</i>	0.017	1.00						
<i>Unrelated Merger USA(t)</i>	-0.001	-0.05						
<i>Related Merger UK(t)</i>	-0.161	-4.14						
<i>Unrelated Merger UK(t)</i>	-0.094	-2.75						
<i>Related Merger CEU(t)</i>	-0.067	-2.02						
<i>Unrelated Merger CEU(t)</i>	-0.089	-2.60						
<i>Friendly Merger(t)</i>			-0.028	-2.60				
<i>Hostile Takeover (t)</i>			-0.082	-1.17				
<i>NoTender USA(t)</i>					0.021	1.52		
<i>Tender USA(t)</i>					-0.082	-2.02		
<i>NoTender UK(t)</i>					-0.141	-4.63		
<i>Tender UK(t)</i>					-0.084	-1.65		
<i>NoTender CEU(t)</i>					-0.072	-2.75		
<i>Tender CEU(t)</i>					-0.145	-2.00		
<i>Domestic USA(t)</i>							0.015	1.04
<i>Cross border USA(t)</i>							-0.017	-0.52
<i>Domestic UK(t)</i>							-0.137	-4.46
<i>Cross border UK(t)</i>							-0.085	-1.64
<i>Domestic CEU(t)</i>							-0.073	-2.20
<i>Cross border CEU(t)</i>							-0.086	-2.37
Sargan test	0.39		0.41		0.45		0.40	
AR(1)	0.00		0.00		0.00		0.00	
AR(2)	0.65		0.62		0.66		0.68	

Note: Time, firm and divestiture dummies are included but not reported.

Panel B: Chi-squared tests of differences in specific aspects of merger activity (p-values)

Related USA-Related UK	0.000
Related USA-Related CEU	0.025
Related UK-Related CEU	0.065
Unrelated USA- Unrelated UK	0.018
Unrelated USA- Unrelated CEU	0.025
Unrelated UK- Unrelated CEU	0.921
Friendly-Hostile	0.440
Tender USA-No-tender USA	0.016
Tender UK-No-tender UK	0.322
Tender CEU-No-tender CEU	0.331
No-tender USA- No-tender UK	0.000
No-tender USA- No-tender CEU	0.002
No-tender UK- No-tender CEU	0.085
