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The effects of Cross-border Mergers on wages
in United Kingdom

Camelia Florentina Daboveanu

Student ID: 6314961

The Faculty of Economics and Business – Msc Organizational Economics

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Supervisor: Dr. Jo Seldeslachts

Abstract

The consistent large activity of cross-border mergers and acquisition over the last years opened a new space for the research of the impact they have on workers, companies and the entire economy. The main focus of this research paper is to shed more light on the effects of cross-border mergers on wages in the United Kingdom, by investigating two “channels” through which the foreign direct investment affects the wages: the spillover effects and the bargaining effects.

In order to approach this topic, I make use of United Kingdom data on total number of mergers, total value of merger transactions, union density and wage rates over the period 1995-2005. The results obtained indicate that the cross-border activity taken as number of mergers does not impact workers’ wage rates. On the other side, the cross-border activity taken as the total value of merger transactions decreases the wages when the unionization factor is high.

Introduction

The accelerating growth of cross-border mergers and acquisitions is acknowledged as being one of the most significant developments in international trade of the post-World War II era as asserted by Vansconcellos and Kish (2006). Qiu (2004) enforces this fact by proving that because of foreign direct investment (FDI), cross-border alliances and mergers dominate domestic alliances and mergers; Mudambi (2004) finds support in the same direction and documents that cross-border mergers and acquisitions represent over 80% of total FDI. A great deal of research has been devoted to the macroeconomic effects of FDI (Neto, Brandao, 2008), the determinants of these activities (Brakman, Garretsen, 2008; Manchin 2004), and the integration of human resources issues (Child, Faulkner, 2001). but a worthwhile focus is the impact that the cross-border merger activities have on wages; more specific, the impact on wages consisting of potential positive-spillover-effects and potential of negative-bargaining-effects. The cross-border mergers give the possibility to the domestic firms to gain the technology know-how and new managerial practices from the multinational enterprises (MNEs), which may lead to the wage increases. The potential of negative effects on wages comes from the fact that MNEs have the upper hand in the bargaining process over the workers’ rents.

Cross-border mergers and acquisitions (M&A) are the most common form of foreign direct investment and are seen as a mixture of capital, technology, managerial skills and export contacts which facilitate the technology transfer to the hosting nation in order to reduce the technology gap between developing and industrial countries (Tong and Hu, 2003)¹. The reason behind this relates to the fact that multinational enterprises in general possess more technological knowledge and their entry into the domestic market is accompanied by superior assets in order to balance the advantage of domestic firm which are more familiar with the local consumer preferences and business practices (Blomstrom, 1999).

It is well-founded to state that the part of the assets brought by MNEs is unavoidable spread to domestic firms. However, if multinationals have an incentive to avoid spillovers to domestic firms competing in the same sector, they have no incentive to obstruct spillovers to local upstream sectors (backward linkages) since they might benefit from improved performance of input suppliers (Javorcik 2004).

Thus, the presence of the MNE's in the host country provides opportunities for domestic firms to gain access to new practices from their economic activity, to improve efficiency and to acquire new skills (Tong Hu, 2003) which end up with the cost reductions and improvements of total productivity (Helpman, 1999). Successively, this leads to an increase in wages since rents reflect the productivity of labor according to Aitken, Harrison, Lipsey (2004). Summing up the above, the technology gains from cross-border mergers will be passed on to the labor force through increased productivity and wages.

Unlike the positive spillover literature, however, there is a distinct literature who supports that the increase of wages is unrelated to productivity but is the outcome of a bargaining process between firms and workers. When the labor force is confronted with a highly mobile FDI, the bargaining power belongs to firms and the wages exhibit a tendency to stay low due to the outside option of firms which can move the production to a lower cost destination (Vijaya, Kaltani, 2007). Therefore, it is unlikely for the productivity gains to be passed on to workers and they may have to accept lower payoffs.

¹ Host nation is the country which receives the investment flows with the purpose of growing economically and financially

As Caves, 1996 and Choi, 2001 point out, the advantage of MNEs by having the upper hand in the bargaining process takes a sharper form as firms might simply impose themselves over the labor force through the creation of “threat effect”. Just by the threat of transferring production abroad, the labor force faces a “one-way boat” situation and accepts a lowering of wages. Besides, an increased competition due to entry of foreign firms puts pressure on domestic firms who see themselves in the position to reduce costs, a practice that would lower the workers outside option and accentuate further their weak bargaining power (Vijaya, Kaltani, 2007).

The rules underlying the bargaining process might be impacted as well by institutional changes. The countries willing to attract more FDI adopted changes of business rules and provided incentives to MNEs like special subsidies and taxes which lower both bargaining cost of firms and bargaining power of labor force (Blomstrom and Kokko, 2003).

Before deepening these two literatures – spillover and bargaining effects – it is worthwhile to mention the drawbacks these suffer as has been notified by several theorists in their works. The positive spillover effects literature experience a deficiency of formal theoretical studies, being dominated instead by empirical research (Fosfuri and Mota, 2001, Glass and Saggi, 2002). On the other hand, negative bargaining effects abound in theoretical work and lack in the empirical one as scholars Choi (2001), Lommerud et.all (2006), Braun (2008) noted.

Even if the concepts of spillover effects and bargaining effects have during a long time been dealt with separately by many scholars, an important aspect to mention is the literature shortcoming of integrating both spillover and bargaining effects of cross-border mergers in one conceptual framework. With this lack of work in mind, I aim to further bring in a complete theoretical framework consisting of the cross-border merger activity and the spillover and bargaining effects afferent. Clougherty, Gugler and Sorgard (2011) bring in an important contribution to the literature by approaching this topic and developing an empirical analysis on USA market.

Through the theoretical model is prognosticated that under unionization, the firms’ bargaining effects dominate over the spillover effects. Therefore, the cross-border mergers will tend to decrease more the wages under high unionization rates than under low unionization rates. Following Makaev’s (2010) results, the acquirers are larger, more productive firms while the

targets are less productive firms; this leads to predict that outward cross-border mergers lower wages more than inward cross-border mergers do. In order to connect the theoretical work with the empirical work, it is worth to analyze both cases when positive spillover effects appear post-merger and when negative bargaining effects appear post-merger; put it in other words, to identify when the cross-border merger activity generates wage increases or reductions. To test this goal, I use panel data on wages, union density and mergers for United Kingdom, covering nine industries groups over 1995-2005.

To investigate these issues, the paper is organized as follows. The next section (section II) exhibits the relevant literature and key facts about cross-border mergers. The third section consists of the theoretical model and sets up the empirical hypothesis. The fourth section describes the structural model and the database. The fifth section points out the empirical results. Section six concludes.

Background

To shed more light on the theoretical work of how cross-border merger activity impacts wages, it is worthwhile to introduce further a detailed literature review of this concept. To do so, I first employ separate summaries of the positive spillover effects and negative bargaining effects, with a focus on spillover effects in order to overcome the lack of research on this topic. As mentioned above, there is little work on integrating and analyzing the spillover and bargaining effects, therefore a single framework on the two opposite literatures regarding the impact of cross-border mergers on wages will be put forward.

It is well pointed out by scholars (Choi, 2001, Braun, 2008) that there is a plenitude of theoretical research on negative bargaining effects and the deficiency of empirical work. In order to overcome this shortcoming, several recent studies focused on labor force data at industry/firm level. The results obtained from industry/firm level data, however, may conduct to biased interpretations since this method does not control for work-force changes due to cross-border mergers.

Therefore, an increasing number of scholars (Martins, 2006, Heyman, 2007) narrowed their focus and have made use of employer-employee data to analyze the effect of foreign ownership on wages. By using workers-level data eventual biases generated by employees who change their job between domestic and foreign firms are controlled for. The results on employee level data challenge the conventional approach which claims that foreign takeovers of domestic firms generate wage increases. In this sense, Martins (2006) and Heyman (2007) find for Portugal and Sweden, respectively, that the individual wages are actually reduced by 3% for the workers in foreign firms compared to those in domestic firms. The wage premium, thus, disappears.

Consistent with these findings are the results obtained by Lommerud (2006) and Balsvik (2012). Both works include the unionization factor in their research and show that the companies with monopolistic power in the output market that bargain over wages with monopolistic unions may reduce the rents by merging internationally, and in this way switching production between countries in order to keep low costs. This advantage constrains unions and gives them the “lower hand” in the bargaining process.

Balsvik (2012) finds further empirical support of this theory by analyzing Norwegian manufacturing plants and shows that in a fully unionized firm the wages decrease with 9% when they pass under foreign ownership. Even if the studies support the notion that the foreign ownership decreases the bargaining power of unions which in turn have to accept lower rents, there is still more space to give further strength to this theory.

If the bargaining effects literature abounds in theoretical studies and lacks in empirical approach, on the opposite side is the spillover effects literature situated. As mentioned by Gorg and Greenaway (2004), the empirical literature has taken roots with help of Caves (1974), Globerman (1979), Blomstrom (1986) and extended further by other scholars but with a similar basic approach. As Tong and Hu (2003) notice, even if there is a lack of theoretical approach of the spillover effects on the hosting country, there is little controversy regarding the positive impact of them.

However, the empirical studies have not been able to exhibit consistent evidence of the positive spillover effects of cross-border mergers. While some scholars show that there exist significant positive spillovers – Caves (1974) on Australia, Blomstrom (1983) on Mexico- many others find

insignificant spillover effects -Aitken and Harrison (1999) on Venezuela, Haddad and Harrison (2003) on Marocco. It is worth mentioning that the empirical papers briefly mentioned above employ data collected at firm level or on the more aggregated level using industry data.

Tong, Hu (2003) identified that the spillover effects of FDI (with cross-border mergers as its most important form) from industrialized economies differ from those from newly industrialized countries. This fact might underlie the differences of results of significant/insignificant positive spillovers since the studies carried employ data on economically different countries. The FDI from industrialized countries (which are assumed to embed more advanced technology) exhibit a larger spillover impact than the newly industrialized economies (which are assumed to carry moderate technology).

Besides the mechanism underlying the spillover effects, it is worthwhile to notify how and why the technology diffusion among host firms takes place. The direct technology transfer is “granted” to the indigenous firm acquired which faces a boost of productivity and consequently a wage increase (Andrews et al. 2007, Braun 2008, Martins, 2008). However, the direct knowledge transfer is seen more as a composition-effect according to Girma et al. (2001), whereas the concern of spillovers literature relates more to the spillovers to non-merging indigenous firms due to cross-border mergers. These are the externality-based effects. Gorg and Greenaway (2003) identified four spillover channels through which the know-how and technology might be spread: imitation (demonstration), skills acquisition, competition and exports.

The imitation channel is the most common method for products and processes and the non-merging firms mimic the behavior of MNEs. The capture of new technology can happen through the migration/employment of the labor force from MNEs to the domestic firm, by carrying with them know-how, marketing or managerial practices. Haaker (1999) claims this spillover channel to be the most important one. The third channel, the competition effect, can be seen as a natural economic response of domestic firms which have to quickly improve their practices in order to effectively compete with MNEs. The last channel identified relates to productivity gains due to the possibility to learn to export from multinationals.

However, MNEs have no interest to avoid spillovers to upstream sectors since this might lead to increased efficiency of suppliers which MNEs may benefit from. Thus, indigenous firms have the possibility to benefit from these improvements as well.

As mentioned in the introduction section of this paper, the main purpose is to integrate the both effects discussed (the bargaining negative and the spillover positive effects) generated by cross-border mergers under one single framework. Even if plenty of work on both topics has been separately carried on, the literature is missing of only one approach which simultaneously analyzes them. However, Gaston, Nelson (2002) and Conyon et al. (2002) consider the power of MNEs to bargain with upper hand over rents as indirect effects of FDI, where the direct effects are described by the higher productivity/wages. The scholars just mentioned seem to be the only ones to extend the research and to show how cross-border mergers affect wages. With the above in mind, the further purpose of this overview is to explain when the impact of cross-border mergers on wages is negative or positive.

Theoretical Model

The theoretical model follows the model developed by Clougherty, Gugler and Sorgard (2011) in the paper “Cross-border mergers and domestic wages: integrating “positive spillover effects” and “negative bargaining effects”. As in the model created by the three scholars, I employ three firms which sell in one market, where firm 1 and 2 are domestic and firm 3 is a MNE. Considering one product i , the below inverse demand function is applied:

$$p_i = a - q_i - b \sum_{j \neq i} q_j, \text{ where } i, j = 1, \dots, 3, i \neq j \quad (1)$$

- q_j is the quantity sold of product i
- $0 < b < 1$ is a measure of product differentiation ($b=1$ for perfect substitute products, $b=0$ for unrelated products)

The firms’ technology is assumed to produce one unit with one unit of labor. Thus, $q_i = n_i$, where n_i is the amount of labor needed to produce the product i and each employee firms entails a wage cost noted further as w_i and a non-wage cost noted as c_i ; in order to generate a positive supply, one needs to assume $a > c$. Further it is assumed, as in Lommerud et al. (2006), that mergers

might generate savings in non-wage cost due to increased productivity exhibited after the cross-border mergers. Thus, μ_i measures the post-merger savings of non-wage costs for firm i . Before the merger, there are no cost savings and $\mu_i = 0$; after the merger $0 \leq \mu_i \leq 1$.

The cost function for firm i is then:

$C_i = w_i + c(1 - \mu_i)$, where μ_i captures both spillover effects to the domestic merging firm (composition based effects) and to the non-merger firm (externality-based spillover effects).

Furthermore, it is assumed that domestic countries are developed, the industry unions within these economies have the purpose to maximize the total rent for its members and wage differentiation for different firms in the same industry is permitted. In the foreign country the labor force is assumed to be under no unionization.

I assume as well an outside option for the workers noted w_0 which equivalents to the no-merger situation and a parameter s expressing the share of externality and composition based effects which can be arrogated by workers. Summing up, it can be asserted that under the no-merger situation μ_0 , the outside option is w_0 and after merger the outside option is $w_0 + s\mu_1$. I suppose furthermore that the wage in the foreign country equates the outside option: $w_3 = w_0 + s\mu_3$.

With the above in mind, the utility function of the union in the indigenous countries equals:

$$\text{Max } U = \sum (w_i - w_0 - s\mu_i)n, \text{ where } i = 1, 2 \quad (2)$$

and the profit function at firm i is:

$$\pi_i = (p_i - w_i - c[1 - \mu_i])n_i, \text{ where } i = 1, 2, 3. \quad (3)$$

Under no mergers in a market (denoted A), the domestic wages are:

$$w_i = \frac{(a-c)(2-b) + (w_0(2+b))}{4} \equiv w_i^A, \text{ where } i = 1, 2 \quad (4)$$

As already stated, a cross-border merger implies both externality-based effects and composition-based effects. In the situation of a merger between one domestic firm (noted i) and the foreign firm (noted 3), two composition-based spillover effects are captured since the least efficient merging firm improves its productivity. The first case when the domestic merging firm is more

efficient ($\mu_3 > 0$ and $\mu_i = 0$), the composition based effects belong to the foreign firm. Second, when the foreign firm is more efficient ($\mu_i > 0$ and $\mu_3 = 0$), the composition based effects pertain to the domestic firm. Makaev (2010) proved based on roughly 1 million mergers observed over ten years- that the less efficient target firm is acquired by the more efficient firm. In other words, the outward cross-border merger implies $\mu_3 > 0$ and $\mu_i = 0$, while the inward cross-border merger implies $\mu_i > 0$ and $\mu_3 = 0$. The externality-based spillover effects are linked to the non-merging domestic firm (noted $-i$) which is not implicated in the cross-border merger but nevertheless captures productivity gains due to the merger ($\mu_{-i} > 0$). Because only one firm in the foreign country is considered, there is no spillover effect to any other external non-merging firm.

With the above notation in mind, it can be shown that the domestic wages in the two firms equal:

$$w_i = \frac{(a-c)(1-b) + w_0(1+b) + c([1+s]\mu_i - [1-s]b\mu_3)}{2} \equiv w_i^I \quad (5)$$

$$w_{-i} = \frac{(a-c)(2-b) + w_0(2+b) + c([1+s]2\mu_i - [1-s]b\mu_3)}{4} \equiv w_{-i}^I \quad (6)$$

In order to capture the bargaining effects, it is assumed that there is a cross-border merger which does not enjoy any post-merger spillover effects ($\mu_i = \mu_{-i} = \mu_3 = 0$). Thus, the wages of the merging firms in the domestic country are lower compared to the no-merger scenario. The reason behind this is the fact that the low cost foreign production (the outside option) that the merged firm can turn to in order to reduce/replace the high cost of the indigenous production. To avoid this case, the domestic trade union chooses to decrease the wages and impedes the employment loss in the domestic entity. This situation allows inferring that the cross-border merger leads to a higher competition between the employees in the indigenous firm and the workers in the foreign firm, which then lowers the post-merger wages. Summing up, the competition between the domestic and foreign employees underlies the negative-bargaining effects.

Due to the high impact that unionization might have on wages, it is worthwhile to further discuss the concept in a post-cross-border merger situation. Let's denote θ the degree of unionization. As mentioned above, the union sets lower wages in order to dampen the potential loss of

employment in domestic country. However this negative impact on indigenous wages might be offset if a trade union would also exist in the foreign country and if it would react to the improved productivity by increasing the wages. This action will have as a side effect the mollification of the domestic trade union's incentive to set lower wages.

Thus, in the scenario with all workers unionized, it can be assumed that the trade union maximizes the wages for its members. If there is no unionization, then the wage "at play" is only due to the competition which in turn drives the negative bargaining effects. To deepen this matter, the case of no spillover effects after a merger ($\mu_i = 0$) is considered, the outside option $w_0 = 0$ and the union establishes one same domestic wage ($w_1 = w_2 = w$). The last assumption has the role to allow the comparison of wages before and after mergers. Then the utility function of trade union is:

$$\text{Max } U = (w)^\theta (n_i)^{1-\theta}, \text{ where } i = 1, 2 \quad (7)$$

It can be inferred that first, when all workers are unionized then $\theta = 1$ and second, when all workers are under no union then $\theta = 0$ and the wages are driven by competition. The domestic wage differences before and after the cross-border merger can be expressed as:

$$w^I - w^A = \frac{\theta b(a-c)(4-2b+b^2)}{b^2+4b-8} \quad (8)$$

The „no unionization" case ($\theta = 0$) implies a straight-forward situation when the wages are competitive prior and post cross-border merger and no additional interpretation may be concluded. When $\theta > 0$, the domestic wages decrease post-cross-border merger and this outcome actually captures the bargaining negative effect discussed. However, a high unionization involves a high wage before mergers, but due to the threat of the outside option, there is pressure on lowering the domestic wages after mergers. A further increase in unionization deepens the difference between indigenous wages before and after the cross-border mergers.

Summing up, the unionization tends to increase the strength of negative bargaining effects over positive spillover effects. A higher degree of unionization leads to the pressure to lower the indigenous wages after the cross-border merger. Thus, the hypothesis to be test can be summarized as:

Hypothesis : *“The higher the degree of unionization in an industry, the higher the probability of cross-border mergers to determine wage decreases in the domestic firms.”*

Clougherty, Gugler and Sorgard (2011) define the cross-border merger variable as the total number of transactions. However, I find it noteworthy to extend the definition of this variable and additionally consider the total value of cross-border transactions, besides the total number of mergers. Therefore, further in the fourth and fifth section, I make a distinction between the number of cross-border mergers and the total value of cross-border transactions.

Empirical Model

In order to examine the correlation between the cross-border merger activity and the domestic wages in the same industry, an empirical approach analogous to the one taken by previous studies is developed. The difficulty encountered in this process relates to a clear recognition of the spillover and bargaining effects, a fact lamented by previous scholars as well. Therefore, before starting the empirical estimation of the relation between independent variables (spillover – bargaining effects) and dependent variable (domestic wages), it pays off to derive from the earlier literature the effects of the first one.

According to Conyon et al. (2002) and Poole (2009), the spillover effects are driven especially by the diverse impact of the cross-border merger on the domestic activity. Therefore, I first consider the total merger activity in an industry (denoted „Total Merger Activity”) in order to exhibit the general effects on wages as result of the increased competition and other labor market changes. Accordingly, I identify the part of total merger activity that is cross-border (denoted „Cross-border Share”), which should capture any change in wages due to a merger activity which is more cross-border in nature.

Besides these variables presented, the non-merger variables that impact the average wages in an industrial sector are measured and included (the control constructs in equation $(X)_{i,t-1}$) in order to identify better causal inferences on the merger variables. Lawrence (1985) found that the capital intensity (denoted „Capital Intensity”) has a strong positive influence on the average wages; Haworth (1971) and Horraine (2001) showed that the higher the female participation (denoted

„Female Participation”) in an industrial sector, the lower the wages are. Furthermore, the operational profit (denoted „Operational Profit”) has a positive impact on the average wages since employees in profitable industries are paid more compared to the workers in unprofitable sectors (Pugel, 1980). Dickens and Katz (1987) include in their studies the employment growth (denoted „Employment Growth”) in order to control for labor market changes. A clear correlation takes place when comes about the higher wages for workers which contribute more to the value added (denoted „Value Added”) (Johnson, 1972).

Moreover, the distinctive effect of approaching the cross-border merger activity as opposed to the total merger activity is analyzed. As Poole (2009) proves, there is a positive relationship between the cross-border mergers and the interactions between indigenous and foreign firms: the larger the share of cross-border mergers, the higher the number of interactions between domestic and foreign firms, which in turn may lead to increased positive spillover effects to the merging and non-merging entities.

The presence of positive spillovers generated by the cross-border activity would involve a positive coefficient estimate of the cross-border share and captures a wage increase above the one set up by the positive effects due to total merger activity. This differential effect within an industry sector due to the cross-border mergers compared to the total mergers is the main focus of the analysis. Since the focus is on the merging and non-merging firms, the differential impact consists of both composition based and externality based spillover effects.

Scholars like Poole (2009) and Balsvik (2011) performed good work by putting in the same pool both spillover effects after compiling employees data. Martins et al. (2008) argue that the composition based effect is considerably driven by the higher wages that foreign firms do pay compared to the domestic entities. Therefore, the wage premium given to the workers of the acquired firms is a significant part of the spillover effects. However, the theorists still encounter difficulties in defining the scenarios where the positive spillover effects overcome the negative bargaining effects.

As already discussed, there are two important situations of cross-border mergers exhibiting negative bargaining effects: first, when the wage set up is driven by the competition between the

domestic and foreign workers and second, when the indigenous employees are organized in unions which bargain over their wages.

Johnson (1972) and Lawrence (1985) approach the direct effect of unionization on wages and show in their empirical work that higher unionization in a certain industry sector leads to an increase in average wages. However, the interaction of cross-border share with unionization implies the inclusion of negative bargaining effect in the impact on wages, since the unions have the lower hand in the negotiation process and they cannot set up competitive wages. Therefore, the more cross-border interactions take place, the more difficult it is for unions to bargain and to establish higher wages for workers covered.

Thus, the wage equation which tests the first hypothesis stated above takes the following form:

$$\begin{aligned} \text{Wages}_{i,t} = & b_0 + b_1(\text{Total Merger Activity})_{i,t-1} + b_2(\text{Total Merger Activity} * \text{Unionization})_{i,t-1} + \\ & b_3(\text{Cross-border Share})_{i,t-1} + b_4(\text{Cross-border Share} * \text{Unionization})_{i,t-1} + b_5(\text{Unionization})_{i,t-1} + \\ & \beta(X)_{i,t-1} + \varepsilon_{it} + \alpha_i + \gamma_t, \end{aligned} \quad (9)$$

where i denotes the industrial sector, t indexes time, $(X)_{i,t-1}$ is a vector of lagged control constructs, α_i represents the fixed panel specific effect and γ_t denotes the fixed period specific effect.

In line with the main findings of previous theoretical and empirical works, it is expected that a higher degree of cross-border merger activity leads to higher wages that captures the positive spillover effect. Besides this, it is expected that a higher degree of unionization leads to higher wages (capturing the direct unionization effect) and it is expected that a higher degree of interaction of cross-border merger and unionization leads to lower wages (capturing the negative bargaining effect).

Based on the same reasoning as above, I additionally test whether the Value of Total Merger activity and the Value of Cross-border Share exhibit the same behavior as assumed in the first hypothesis. Now, the wage equation takes the following form:

$$\begin{aligned} \text{Wages}_{i,t} = & b_0 + b_1(\text{Value of Total Merger Activity})_{i,t-1} + b_2(\text{Value of Total Merger Activity} * \\ & \text{Unionization})_{i,t-1} + b_3(\text{Value of Cross-border Share})_{i,t-1} + b_4(\text{Value of Cross-border Share} * \\ & \text{Unionization})_{i,t-1} + b_5(\text{Unionization})_{i,t-1} + \beta(X)_{i,t-1} + \varepsilon_{it} + \alpha_i + \gamma_t, \end{aligned} \quad (10)$$

The notation is analogous to the first wage equation. The expectations are in line with the ones mentioned above: a higher value of the cross-border merger activity leads to higher wages (capturing the positive spillover effect); a higher degree of the unionization leads to higher wages (capturing the direct unionization effect) and a higher value of the interaction of cross-border merger and unionization leads to lower wages (capturing the negative bargaining effect).

In order to test the hypothesis, I employ a panel data structure and I control for fixed panel effects and period (year) specific effects. As Liu et al. (2000), Chung (2001) argue, the best methodology to control for non-time-varying omitted variables is to take advantage of the panel data structure. The next sections continues with a discussion of the data used.

Data

The source of merger data in the United Kingdom is Thomson One Banker Mergers and Acquisition database which provides a comprehensive range of financial documents. This sample consists of all deals announced and completed between 1995 and 2005, with the equity acquired of the target firm higher than fifty percent and with the total transaction value of at least one million dollars.

The Total Merger Activity defines the total number of mergers (domestic and cross-border) divided by the total number of employees (expressed in thousands) in an industry sector. Along with this merger variable, I employ as well the Cross-Border Share which is expressed as the percentage of total number of mergers. Additionally, I include among the explanatory variable the Value of Total Merger Activity and the Value of Cross-border Share. All variables are documented from Thomson One Banker and Compustat data, Table 1 below provides detailed info.

Non-merger variables are included as well. The average operational profits, the average wages, the average of capital intensity and the number of employees are yearly collected data from the Compustat database (on firm level). The Compustat is a fundamental database of financial and market information covering companies throughout the world. Out of all information provided, I make use of Compustat Global fundamentals. The data on number of employees is restricted to

workers aged 16-54 for each industry. Data on the employment growth and female participation per industry is derived from Eurostat database. The gross value added and the trade union density are compiled from the National Office of Statistics United Kingdom.

All variables are categorized on nine groups of industries aggregated based on two digit SIC UK 2003 (9 SIC UK 2003²). However, in first instance, all data on merger and non-merger variables except unionization have been clustered on 28 two digit SIC UK industries. The reason why I define the variables in such a broad way comes from a key explanatory variable – the union density. The information on union density suffers from a lack of disaggregation and can only be collected on a broader classification. Therefore, the union density data was clustered in nine groups of industries. In order to analyze the impact of the interaction between the union density and the total merger activity/cross-border share on wages, the merger variables are, therefore, grouped in nine groups of industries using the same codification as for the union density variable.

Table 1 Variable definitions

Merger variables	
Total-Merger-Activity	Total number of mergers (i.e., both domestic and cross-border) divided by thousand employees based on 9 SIC UK 2003; source: Thomason Financial Securities.
Cross-Border-Share	Total number of cross-border mergers divided by total number of mergers based on 9 SIC UK 2003; source: Thomason Financial Securities.
Value of Total-Merger-Activity	The value of Total-Merger-Activity based on 9 SIC UK 2003.
Value of Cross-Border-Share	The value of Cross-Border-Share based on 9 SIC UK 2003.
Other variables	
Wage	Wage in USD (the regressions use the natural logarithm); source: COMPUSTAT.
Employees	Full time equivalent employees in thousands; source: COMPUSTAT.

² All merger and non-merger variables are categorized in 9 industry groups, hereafter noted as 9 SIC UK 2003 (Standard Industrial Classification of Economic Activities in United Kingdom)

Value-Added	Value added per employee in mlns. of USD; source: National Office of Statistics UK.
Employment-Growth	Annual percentage change in the total number of employees; source: EUROSTAT.
Unionization (trade union density)	Share of total employees unionized according to membership; source: National Office of Statistics UK.
Operational-Profit	Operational profit before tax per employee in mlns. of USD; source: COMPUSTAT.
Female-Participation	Share of women out of all employees; source: EUROSTAT.
Capital-Intensity	Capital per employee in mlns. of USD; source: COMPUSTAT.

Empirical Results

Table 3 shows the empirical results for two regression estimations based on equation (9) which test the hypothesis stating that the higher the degree of unionization in an industry, the higher the probability of cross-border mergers to lead to wage decreases in the domestic firms. In this analysis I employ two techniques to analyze the panel data: first, I estimate a regression specification that involves a fixed effects estimation method and second, I estimate a regression specification by employing a random effects estimation method. The fixed effects method has the role to analyze the impact of variables that vary over time and to study what causes the changes within an industry. To do so, the model controls for time-invariant differences between industries. Unlike the fixed effects method, the random effects model assumes that the variation between industries is random and uncorrelated with the independent variables. In order to choose the best method to analyze the data, one can use the Hausman test which checks a more efficient model against the less efficient one. Usually, the panel data is analyzed by using the fixed effects method, but the random effects model may be a more efficient estimator and give better P-values. However, because of the low number of observations employed in the data, I could not run the Hausman test. Thus, I find it reasonable to make use of both methods.

Table 3 - The Effect of Cross-Border Mergers on Wages

Dependent variable: Natural logarithm of Wage

Estimation Method:	Fixed-Effects		Random-Effects	
Independent Variables	Coefficient	t-val	Coefficient	t-val
Total Merger Activity	1.312*	2.56	2.401**	2.69
Total Merger Activity * Unionization	-0.275*	-2.46	-0.589**	-2.98
Cross-border Share	1.270	0.54	11.76***	4.13
Cross-border Share * Unionization	0.138	0.20	0.118	0.14
Unionization	0.199	1.60	0.515	0.00
Capital Intensity	-0.391	-0.75	-1.96*	-1.97
Female Participation	0.116	0.11	4.03	1.95
Operational Profit	-0.825	-0.59	3.61	1.70
Employment Growth	0.447	1.53	0.772	1.53
Gross Value Added	-0.234	-1.40	-0.513	-1.78
Constant	10.70**	3.14	3.712*	2.07
Observations		78		78
R-squared Within		0.5005		0.5005
R-squared Between		0.3872		0.3872
R-squared Overall		0.3327		0.3327

Note: *t* statistics * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The dependent variable is the natural logarithm of wages at 9 SIC UK 2003.

A full set of year dummies is included.

Variables Unionization (under Random effects) is multiplied by 10^4 , Capital Intensity (under both estimation regressions) is multiplied by 10^3 , Female Employment (under both estimation regressions) is multiplied by 10^2 , Gross Value Added (under both estimations) is multiplied by 10^3 and Employment Growth is multiplied by 10.

The model exhibits a value of R-squared Within slightly higher than .5, a value of R-squared Between of .38 and a value of R-squared Overall of .33. Further, I review the empirical results of each variable employed in the estimation regressions but first of all it is worthwhile to mention from the beginning the drawback of the analysis process due to the low number of observations (78) caused by the absence of detailed data on the unionization level.

The Total Merger Activity implies a positive and significant effect on the average wages in both fixed and random effects regressions. This indicates that the higher the level of total merger activity is, the higher the average wages for employees are. However, when the unionization factor is included, the interaction of the two variables (Unionization and Total Merger Activity) has a negative and significant impact on the wage rates for workers. In the two regression specifications, the sign of the coefficients is negative and the p-values are highly significant, situation that might be mainly driven by the cross-border part of the total merger activity.

It can further be noticed that the Cross-border Share involves a positive and highly significant effect in the random effects regression, a result which is consistent with the findings of previous research papers. This suggests that the cross-border activity generates a wage premium above the generic positive wage due to the total merger activity. These are in fact the positive spillover effects of cross-border merger activity. However, there is no impact of the Cross-border Share in the fixed effects regression. Even if the coefficient appears to have the correct sign, it is not significant.

The interaction between the Cross-border Share and Unionization is positive and insignificant under the both estimations, results which do not meet the expectations of negative bargaining effects generated by the cross-border mergers. Contrary to the findings of previous papers, the outcome of the interaction supports that the cross-border merger activity does not mitigate the power of unions to set up higher wages for its members.

The Unionization variable has a positive but insignificant impact in both the fixed effects and random effects estimations. Thus, a higher level of unionization in the UK labor market does not imply higher wage rates for workers, result which is not consistent with expectations.

As to the control variables, the non-merger variables that impact the average wages of industry sectors are inferred from the existing literature and the results obtained mostly do not follow the

empirical findings. The Capital Intensity appears to have a negative coefficient but no significant impact under fixed effects regression. However, the random effects estimation exhibits a negative and significant effect of the capital intensity over wages which contradicts the prediction and results obtained by Lawrence (1985). The Female Participation appears to not have a significant impact on the average wage rates neither under the fixed effects or random effects estimations.

The Operational Profit exhibits no statistically influence on wages, an outcome which indicates that the companies profits are not necessarily reflected in the rents increases. The Employment Growth appears with positive coefficients but with no significant influences on the average wages, which indicates that the expanding industries do not always results in higher wages for its employees. Finally, the last control variable, Value Added, has no significant impact on the average wage rates. Thus, workers who contribute more to the value added do not derive higher wages out of their „premium effort”.

Table 4 exhibits the empirical results for two regression estimations based on equation (10) which test if a higher value of the cross-border merger activity leads to higher wages, a higher degree of unionization leads to higher wages and a higher value of interaction of cross-border merger and unionization leads to lower wages.

As in Table 3, I show the regression estimations under both fixed effects method and random effects method. The empirical results across the two regression specifications are in general consistent, significant and meet the expectations outlined.

Table 4 - The Effect of the Value of Cross-border Mergers on Wages

Dependent variable: Natural logarithm of Wage

Estimation Method	Fixed-Effects		Random-Effects	
Independent Variables	Coefficient	t-value	Coefficient	t-value
Value of Total Merger Activity	0.162***	3.91	0.0690	0.28
Value of Total Mergers * Unionization	-0.361***	-4.35	-0.137	-0.28

Value of Cross-border Mergers * Unionization	0.0351	1.18	-0.644***	-3.54
Value of Cross-border Mergers	-0.0173	-1.30	0.295***	3.65
Unionization	0.198*	2.03	0.0597	0.60
Capital Intensity	-0.0204	-0.05	2.95	1.13
Female Participation	-0.161	-0.26	-0.540	-0.14
Operational Profit	-0.595	-0.05	2.33	0.41
Employment Growth	0.203	1.09	-0.245*	-2.56
Gross Value Added	-0.708	-1.04	0.191	0.04
Constant	12.08***	4.81	8.521*	2.08
Observations		78		78
R-squared Within		0.6875		0.6875
R-Squared Between		0.0014		0.0014
R-Squared Overall		0.0070		0.0070

Note: *t* statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The dependent variable is the natural logarithm of wages at 9 SIC UK 2003. A full set of year dummies is included. Coefficients of Value of Total Mergers *Unionization are multiplied by 10^3 , Coefficients of Value of Total Merger Activity are multiplied by 10, Coefficients of Capital Intensity are multiplied by 10^3 , Coefficients of Female Employment are multiplied by 10^2 , Coefficients of Gross Value Added and Employment Growth are multiplied by 10^3 .

The value of R-Squared Within appears to be higher than .68 which indicates a relatively strong relationship between variables and a well specified model. As mentioned at the review of Table 3, the model suffers from the low number of observations employed in regressions caused by insufficient data of unionization variable on 2-digit SIC UK 2003. In this case as well, the standard error and Hausman test could not be included due to the low number of observations.

The Value of Total Merger Activity has a positive and highly significant effect on the average industrial sector wages in the fixed effects estimation which suggests that higher values of mergers lead to higher wages for employees. However, under random effects regression there appears to be no significant influence of the merger variable on the wage rates of workers.

Further, the interaction of the Value of Total Merger Activity and Unionization has a strong, negative impact on the wage rates of workers under fixed effects estimation. The negative coefficient might be explained by the share of cross-border mergers of the total activity, which would be in line with the expectations. The random effects estimation, however, does not exhibit a significant relationship between the dependent and the independent variable.

I find as well that the Value of Cross-border Share is positive and highly significant (a t-value of 3.65) in the random effects regression. This result is in line with the expectation of positive spillover effects derived from the cross-border mergers, which it leads higher values of cross-border activity to be reflected in higher average wage rates for employees. As stated in the discussion of Table 3, the cross-border activity captures the premium wage above the positive effect due to the total merger activity.

When the unionization variable is included and interacts the Value of Cross-border Share variable, the empirical result involves a negative effect on the wage rates (under random effects regression). This outcome is consistent with the expectations predicted and captures the negative bargaining effect generated by the cross-border mergers. The higher the value of cross-border mergers, the lower the wages of employees. This results might be caused by the union's ability to ensure wage premium rates for its members which is diminished by the cross-border merger activity. Under the fixed effects estimation, the Unionization variable appears to have a positive impact on the average wages. A higher rate of unionization in a certain industry will generate higher wages. The outcome is consistent with expectations and supports the main purpose of the existence of unions, which is to increase the wages for its members.

Furthermore, the Capital Intensity variable exhibits no significance under both regression estimations employed. The Female Participation variable appears to have the expected negative coefficient, however there is no significance of this non-merger variable on the average wages.

The Operational Profit does not follow previous findings which support the idea that higher profits in a certain industrial sector are reflected in higher rents for the employees. The Employment Growth yields a negative strong coefficient estimates under random effects specification, thus, contrary to the expectations, the developing industries do not increase the wages of its workers. Finally, the Gross Value Added variable does not imply any significance on the average wage rates in none of the estimation regressions.

Thus, the empirical results across the two different regression specifications do not follow entirely the predictions stated, therefore it is noteworthy to develop the discussion about the results obtained.

Conclusion and Discussion

Due to the continuous expansion of the cross-border mergers across industrial sectors and the research gap of their impact on indigenous wages, I integrate in one approach two important perspectives of this subject: the positive spillover effects and the negative bargaining effects derived from the cross-border merger activity.

As predicted in a theoretical model, I test the likelihood of cross-border activity to generate decreases of the workers wage rates under high unionization rates. Besides considering the number of mergers, I employ as well the value of cross-border transactions.

In order to test these theoretical predictions, a panel data set is engaged consisting of measures on the merger and acquisition activity, the unionization and the average wages based on 9 UK industry groups over the period 1995-2005.

The empirical results partially find support for the theoretical predictions. The cross-border merger activity defined as a share of the total number of mergers tend to increase the domestic wage rates. However, when the unionization factor comes at play, I did not find a significant effect of the interaction between the cross-border activity and the unionization on wages. Therefore, according to the obtained results, I find no support for the existing literature which states that this interaction has a negative impact on the indigenous wages.

Additionally, the Value of Cross-border Share is considered in the regression analysis and the outcome comes to strengthen the predictions. Taken itself, a higher value of the cross-border mergers leads to an increase of the workers wage rates, a fact that in essence captures the positive spillover effects. However, when unionization factor is included, the interaction between the two variables generates a negative impact on the average wages. This result captures the bargaining power that companies have over the unions which allows them to set lower indigenous wage rates in the industrial sector with high union density.

The differential results obtained regarding the number of cross-border mergers taken as a share of total number of mergers and the value of cross-border mergers taken as a share of the total value of mergers rise further predictions worthwhile to be researched. When the unionization factor is considered, the value of cross-border activity is more important and has more influence over the wage rates compared to the number of cross-border mergers which seems to not have any influence.

Important to notice as well is the long term decline over the last 20 years in union membership in United Kingdom. One important reason of the decrease is the growth in the number of small enterprises which most of them do not need unions. The high number of cross-border transactions (due to a higher number of firms in UK) and the low union membership may underlie the result of the analysis which states that the interaction term (total number of cross-border mergers and unionization) does not influence the wage rates. However, these assumptions need to be further developed and there is still space for research on the difference between the number and value of cross-border M&A in UK market.

The results obtained in this study are in line with the previous literature and indicate that the cross-border mergers do affect labor market and wages, and the unionization plays a pivot role in this relationship. As Pagel, Wey (2012) notice, the presence of labor unions provides an additional motive to cross-border mergers and companies „enjoy” their bargaining power over the unions as they can move the production above. This „threat effect” of international mergers and acquisition addresses the concern of Eden, Lenway (2001) that globalization of economic activity may determine negative effects in the environment and labor market since „multinational enterprises are in business; they are not social agencies (2001:389)”.

References

- Aitken, B.J, Harrison, A. E. & Lipsey, R.E. 1996. Wages and foreign ownership. A comparative study of Mexico, Venezuela and the United States. *Journal of International Economics*.
- Aitken, B. J. & Harrison, A. E. 1999. Do domestic firm benefit from direct foreign investment? Evidence from Venezuela. *American Economic Review*.
- Balsvik, R. 2012. The bargaining sector of cross-border M&A on wages - working paper draft *Morten Sthre Norwegian School of Economics (NHH)*.
- Blomstrom, M. & Kokko, A. 2003. The economics of foreign direct investment incentives. *NBER Working Paper No. 9489*.
- Blomstrom, M., Sjöholm, F. 1999. Technology transfer and spillovers. Does local participation with multinationals matter? *European Economic Review*. Elsevier, vol. 43(4-6), pages 915-923, April.
- Brakman, S., Garretsen, H., Van Marrewijk, C. Cross-border mergers and acquisitions on revealed comparative advantage and merger wave. *Tinbergen Institute Discussion Paper*
- Braun, S. 2008. Should trade unions welcome foreign investors? Evidence from Danish matched employer-employee data, Discussion paper 7. *Centre for Economic and Business Research*.
- Caves, R. 1996. Multinational enterprise and economic analysis. *Cambridge, Cambridge University Press*.
- Child, J., Faulkner, D. 2001. The management of international acquisitions. *Oxford, Oxford University Press*.
- Choi, M. 2001. Threat effect of foreign direct investment on labor union wage premium, Working paper 27. *Political Economy Research Institute*.
- Clougherty, J. A., Gugler, K., Sorgards, L. 2011. Cross-border mergers and domestic wages. Integrating positive spillover effects and negative bargaining effects. *Department of Economics, University of Economics and Business Vienna*.

- Conyon, M. J., Girma, S., Thompson, S. & Wright, P. W. 2002. The productivity and wage effects of foreign acquisitions in the United Kingdom. *The Journal of Industrial Economics*.
- Eden, L., Lenway, S. 2001. Introduction to symposium multinationals: The Janus face of globalization. *Journal of International Business Studies*.
- Fosfuri, A., Motta, M. 2001. Foreign direct investment and spillovers through workers' mobility. *Journal of International Economics*. 205-222.
- Gaston, N. & Nelson, D. 2002. Integration, foreign direct investment and labour markets: Microeconomic perspectives. *The Manchester School*. 420-459.
- Glass, A. J., Saggi, K. 2002. Multinational firms and technology transfer. *Scandinavian Journal of Economics*.
- Globerman, S. 1979. Foreign direct investment and spillovers efficiency benefits in Canadian manufacturing industries. *Canadian Journal of Economics*.
- Haaker, M. 1999. Spillovers from foreign direct investment through labor turnover: the supply of management skills. Discussion paper. *London School of Economics*.
- Helpman, E. 1999. The structure of foreign trade. Harvard Institute of Economic Research, Working paper 1848. *Harvard – Institute of Economic Research*.
- Javorcik, B.S. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages, *American Economic Review*.
- Lommerud, K. E., Straume, O. R., Sorgard, L. 2006. National versus international mergers in unionized oligopoly. *Journal of Economics*. 212-233.
- Makaev, T. 2010. The dynamics of international mergers and acquisitions. *University of Maryland*.
- Martines, P.S 2008. Foreign ownership, employment and wages in Brazil: Evidence from acquisitions, divestments and job movers. *IZA*, Discussion paper 3542.

Manchin, M. 2004. Determinants of European cross-border mergers and acquisitions. *Economy European Commission Directorate-General for Economics and Financial Affairs – Economic Paper*.

Mudabi, R. 2004. The location behavior of multinational enterprise: Some analytical issues. *Growth and Change*. 491-524.

Neto, P., Brandao, A & Cerqueira, A. 2008. The impact of FDI, cross-border mergers and acquisitions and greenfield investments, Working Paper 291. *University of Porto, Faculty of Economics Porto*.

Qiu, Larry D. 2010. Cross-border mergers and strategic alliances. *The Quarterly Journal of Economics*.

Tong, S.Y., Youxin, A. 2003. Initial Evidence from Chinese Manufacturing *Faculty of Business and Economics The University of Hong Kong December 15-16*.

Vasconcellos, Geraldo M. & Richard J. Kish. 2006. Cross-Border Mergers and Acquisitions. *The Encyclopedia of Finance. United Kingdom and The Netherlands: Kluwer Academic Publishers*, 664-675.

Vijaya, R.M. & Kaltani. 2007. Foreign direct investment and wages: a bargaining power approach. *Department of Economics Richard Stockton College of New Jersey*

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