

Rising metropoli: The geography of mergers and acquisitions in Germany

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Rising metropoli: The geography of mergers and acquisitions in Germany*

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Abstract

High levels of mergers and acquisitions (M&As) have been a characteristic of the global economy in the 1990s. The overall effects of M&As on economic welfare and its spatial implications, however, remain a profoundly neglected topic. Using three standardized indices representing the relative quantity of takeovers in each German *Regierungsbezirk*, we demonstrate that the recent wave of M&As has resulted in a major concentration of firms and economic activity in the main German metropoli. The paper then turns to the dynamics of M&As and to the study of the flows of M&A transactions. By means of regression analysis, we identify the main drivers of the geographical concentration of firms to be indicators of the general level of agglomeration (i.e. regional GDP and population) and the concentration of political power in the region. The results also indicate that investment in R&D, the general level of education, or unemployment, when considered in combination with agglomeration indicators, play a negligible role in determining M&A flows. With respect to the geographical distance between a merging or acquiring firm and its target, the results are twofold. While, when considered on its own, distance has a very weak or – depending on cases – insignificant association with the dynamics of M&A activity, when estimated in conjunction with agglomeration, proximity appears to play a distinctive role in the geography of M&As in Germany.

Keywords

Mergers & acquisitions, concentration of economic activity, agglomeration, distance, urban regions, Germany

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1 Introduction

From the beginning of the 1980s onwards there has been a rapid growth and diversification of the literature examining the importance of and the interrelationship between cities in a globalising world (e.g. Braudel 1984, Sassen 1984, Castells 1989). Friedman (1986, 1995) established a global urban hierarchy in which London, New York, and Tokyo occupy the top echelon as 'global financial articulations', while other cities, such as Amsterdam or Frankfurt are considered as 'multinational articulations'. Sassen (1991, 1994) regards the dynamism of 'global cities' such as London or 'sub-global cities' (e.g. Frankfurt), as a direct consequence of the spatial dispersion and internalisation of production, leading to the increasing centralization of the management and regulation of major multinational companies, of financial and business services, and government. Global, sub-global, and lower rank cities become interrelated in an emerging 'world city network' (Taylor, 2001a), where the functional links between cities are strengthened beyond physical contiguity (Castells, 1996).

Taken to its limits, this interpretation leads to the emergence of what Veltz (1996, 2000) has called an 'archipelago economy', an economy in which the connections between cities with similar roles in a world economy are greatly enhanced, regardless of distance, as they become increasingly detached from their regional and national contexts. This process is driven both by technological and informational change and by, among others, the increasing importance of national and supranational mergers and acquisitions (M&As), which rocketed during the 1990s. This decade saw a wave of acquisition- and merger-driven consolidation throughout the world, accounting for approximately 70% of the total value of inward investment in developed countries, making M&As a more important component than greenfield investments in foreign direct investment (UN, 1995).

In contrast to the literature underscoring the links between large urban agglomerations, irrespective of distance, other scholarly research analysing the location of economic activity has tended to draw attention to the role of proximity as a determinant in the development of economic activity. Distance, for example, represents a key factor in the new economic geography, where backward and forward linkages and the importance of transportation costs are two important elements behind the rise in economic agglomeration (Krugman 1991, Fujita et al. 1999). Recent literature on innovation has pinpointed the existence of significant distance decay effects affecting, among others, the diffusion of technological spillovers (e.g. Jaffe et al. 1993, Grossman and Helpman 1994, Audretsch and Feldman 1996, Rigby 2000).

And the identification of the economic importance of untraded interdependencies (Storper 1997) further reinforces the role of physical proximity as a determinant in the location of economic activity.

In this paper, we look at these issues in Germany, by focusing on the spatial significance and impact of M&As during the 1990s. Despite the fact that ‘M&A events are intimately connected to a massive organisational and geographical restructuring’ (Dicken and Öberg 1996: 115), the impact of M&As on economic welfare and their spatial implications remain profoundly neglected topics in spatial sciences (see Dunning 1997 or Markusen 2001). Although there have been some analyses of the spatial impacts of recent waves of M&As (e.g. Green 1990, Ashcroft and Love 1993, Lo 1999, 2000, Aliberti and Green 2000, Chapman and Edmond 2000, Nuhn 2001), these studies have been few and have generally tended to focus on specific industries or on large firms for which appropriate data can be compiled (SBA, 1998). A major reason for the lack of research into the M&As phenomenon is linked to the limited availability of comprehensive data covering M&As across regions or cities (e.g. Sachwald 1994). The purpose of the study is to partially fill this gap by examining to what extent M&A activity may be considered a major force shaping recent changes in the economic geography of Germany. By analysing the close to 30,000 M&A transactions that took place in Germany between 1990 and 1999 – contained in the *M&A Review* database – we try to explain the recent evolution of the geography of firms in Germany and to identify the factors behind the concentration of economic activity in large urban areas.

The aim of the present paper is thus twofold. We first examine to what extent urban areas, in general, and large cities in particular, are increasingly becoming the main foci of economic activity as a consequence of the concentration of M&As in cities during the 1990s. Second, we study the factors associated with the increasing concentration of company headquarters in metropolitan areas. The paper contains four additional sections. The next section deals with the theoretical foundations of the interlink between firms, M&As, and cities. The third section reports the results of the empirical analysis of the data on M&As in Germany, by first identifying the urban agglomerations that have benefited the most from the M&As wave of the 1990s and then turning to the dynamics of M&As and analysing the flows of M&A transactions in each of the top German metropoli. The factors behind the geographical concentration of M&As in Germany are presented in section four. Section five provides some concluding remarks.

2 M&As, economic development, and urban regions

A large body of scientific literature has been built in recent years around the idea that the globalisation of the world economy is associated with the genesis of a new territorial pattern, which basically benefits large urban regions. In Castells (1996) 'space of flows' approach, for instance, world cities are considered as the nodes within the global network of financial and business firms. Despite the fact that advances in technology and deregulation trends have rendered capital and information highly mobile, empirical studies have stressed how both factors have become increasingly concentrated in large metropolitan areas. It is argued that the expansion of trade and the development of networks is fostering an ever greater urbanization of capital and decision-making structures and leading to the concentration of wealth and production (Sassen 1990, O'Brien, 1992, Hall 1993, Castells 1998) and to the agglomeration of company headquarters (Bosman and de Schmidt 1993) in core financial and administrative regions. In addition, many large urban areas also display considerable links between political and economic power (Rodríguez-Pose 1998: 81).

Agglomeration economies, i.e. localisation as well as urbanization economies, play a central role in this process (e.g. Sunley 2000, Eberts and McMillen 2000). Economic agglomeration generates positive externalities which lower the production costs of one establishment as the output of others increases. The externalities result from businesses sharing non-excludable inputs, such as a large and proficient labour pool, technical expertise, communication and transportation networks, or a good infrastructural endowment, and from the untraded interdependencies emerging from the interaction of a large number of economic and social agents in a relatively small geographical area (Storper 1997). Financial and business service firms are considered a further major player fostering the concentration of economic activity in urban regions. These areas generally feature a strong link between advanced industries integrated in world economic circuits, on the one hand, and market-oriented services, on the other.

The urbanization of capital and the rise of agglomeration economies are at the heart of a flourishing scholarly literature on world cities. Following Friedmann's (1986) seminal 'world city hypothesis' – which postulates the existence of a global hierarchy of cities developed as 'command and control centres' housing the headquarters of multinational corporations (MNC) – Sassen (1991) has highlighted that the key characteristic of world or global cities is their concentration of advanced producer services. Beaverstock et al. (1999) have resorted to

Sassen's focus on producer services in order to classify cities as alpha, beta and gamma world cities based on the presence of accountancy, advertising, banking/finance, and law firms.

World city studies have fundamentally dwelt on the attributes of particular cities. The relationships between cities have traditionally attracted somewhat less attention. Recently, however, there has been a shift in research focus towards the analysis of the expanding links between large urban areas (e.g. Taylor 2000, 2001a and 2001b, Fosseart 2001, Taylor et al. 2002) and methods to measure the extent of the global connectivity of leading cities across the world have been developed (e.g. Taylor et al. 2001). From this perspective, Taylor (2001a) defines the world city network as an 'interlocking network' in which world or global cities represent more than international financial centres. They are 'the locales for the production of knowledge-rich service products such as in inter-jurisdictional legal services, in place-sensitive international advertising campaigns, and in many new financial instruments' (Taylor 2001b: 3). Hence world cities are defined 'in terms of the critical masses of creative and professional labour organised through global service firms' (ibid.), whose main role is to provide a flawless service for their clients by creating the connections between world cities through their office networks. Geographical distance plays a negligible role in this construct. Following Castells' (1996) network society approach, it is argued that the rise of new enabling technologies in computing and communication has allowed to overcome physical distance in the relationship between world cities.

Accordingly, many of the studies dealing with intercity relationships in a global world have tended to stress the interconnection among large urban areas to the detriment of their relationship with their immediate regional or national hinterland. Pierre Veltz's (1996, 2002) approach, for instance, proposes the progressive replacement of the links between urban centres and their immediate surrounding areas by 'an "archipelago economy" in which horizontal, frequently transnational, relations increasingly outmatch traditional vertical relations with the hinterland' (Veltz 2000: 33).

This metropolization of the world economy is driven to a significant extent by the increasing importance of M&As. According to what has been outlined so far, large urban areas are perceived to be the perfect laboratories for interfirm relationships and for the completion of M&As, especially at a time when M&As have grown exponentially across the globe. M&As waves tend to be a cyclical phenomenon. Five waves of mergers have been identified during the 20th century by the literature on M&As, coinciding with periods of expansion in the world economy (e.g. Aliberti and Green 2000, Picot 2000). The last and

most important wave in terms of overall volume took place during the 1990s and in particular during the second half of the decade. The total volume of cross-border M&As in the world increased more than six-fold during the 1990s (Rodríguez-Pose 2002: 25). In Germany the expansion was even greater. In 2000 the value of corporate transactions in Germany attained a volume of € 467 billion, compared to € 194 billion in 1999 or € 26 billion in 1990 (M&A, 2001).

The reasons for the considerable increase of M&A activity are multiple and are addressed in the appropriate literature on foreign direct investment (FDI), though, at least for the time being, no unified theory of M&As or FDI exists (see Aliberti and Green 2000). Initial contributions to the theory of FDI, in general, and of mergers or acquisitions, in particular, have been put forward in Hymer's (1960) finance and port-folio theory, in Augmon's and Lessard's (1977) diversification theory of FDI, in Williamson's (1975, 1985) transactions cost economics, and in Dunning's (1979) eclectic approach (or OLI-theory). FDI can take a number of different forms, one of which includes the acquisition of a business enterprise or its assets. The multivariate and partly interrelated motives and theories which have been developed to explain these investment decisions are classified by Cooke (1988) as strategic (e.g. diversification, innovation, or efficiency), behavioural (i.e. interaction between the motives of management and the external environment) and economic (such as synergy, economies of scale, growth or multiple sourcing)¹.

The amount of literature focusing on the locational implications of M&As and on their impacts on economic development is, unfortunately, rather small. Initial attempts to investigate the relationship between economic integration, M&As, and regional economic development have been undertaken by Ashcroft and Love (1993) and by Chapman and Edmond (2000). The latter authors, in their analysis of M&As in the EU chemical industry, observe that 'the shift in the motivation for, and the general increase in the level of merger/acquisition activity is consistent with the a priori expectations regarding the effects of economic integration' (Chapman and Edmond 2000: 755). Globalisation and economic integration thus affect the behaviour of firms – which had grown accustomed to local or nationally'protected environments – in such a way that greater competition leads to moves by firms to secure and/or enhance their market share by means of a greater concentration of resources. This greater concentration of resources is basically achieved through M&As and the restructuring has important implications not just for the survival of the firm, but also for the economic weight of localities and regions. The consequences of a merger or an acquisition

affect the product-mix, the production capacity and the various corporate functions between centres of activity. The impact of such changes upon places finds expression in the level and type of employment and affects inter-firm linkages and supply chains. Despite the fact that the geographical implications of these changes are not entirely clear, Chapman and Edmond (2000: 763) observe that M&As bring about changes in corporate control which, at the European scale, appear to favour the large urban areas of the northern 'core' countries, to the detriment of smaller urban areas within the 'core' and of the southern 'periphery'. The consequences of the latest wave of M&As are hence likely to encourage the geographical concentration of high-level functions, a trend which is partly reflected in the increasing importance of international financial centres as the preferred location for corporate head-offices (see also Clark 1993).

The regional development implications of this phenomenon would depend on the degree to which the management of the enlarged enterprise permits the decentralization of power and responsibility. Young et al. (1994) emphasise the existence of a permanent tension between centralizing and decentralizing tendencies within large companies and that the balance of these forces is crucial in assessing the consequences of M&A activity for regional economic development. However, this is an unequal battle. As the decision-making powers lie in the company headquarters, centralizing forces generally hold the upper hand. The consequence is that M&A transactions are therefore expected to trigger greater backwash than spread effects, fostering economic development in large urban areas.

Does geographical distance play a role in determining the pattern of M&As? As already indicated, in a large number of theories dealing with the increasing concentration of economic activity, in general, and of the growing urbanisation of corporate control, in particular, geographical distance is regarded as almost irrelevant or merely attributed a minor role. In what is basically considered a space of flows, geographical distance is easily superseded by technological progress in telecommunications and by deregulation (O'Brien 1992, Castells 1996). Hence, M&As – as almost any other economic transaction – happen in a world which 'is no longer well ordered by distance, clearly layered [...] between short- and long-span economies' (Veltz 2000: 38). Even if this does not necessarily mean that the significance of distance disappears completely, 'the territory that counts is more and more the territory of social interaction, not merely of physical proximity' (ibid.). From this perspective, the dynamics of M&As are governed by the interpersonal contacts of highly mobile and

telecommunications-literate individuals, whose perception of distance is radically different from the simple geographical distance.

This supposed ‘neutralisation’ of distance stands, however, in sharp contrast with other recent research strands looking at the location of economic activity which have tended to stress the importance of physical proximity in determining the interaction between economic actors. One of these strands is the new economic geography. Despite the fact that the new economic geography has hardly been concerned with the individual behaviour of firms and regards individual firms as basically identical, this approach suggests that the agglomeration or dispersion of economic activity is governed by factors like transport costs, knowledge spillovers, and labour market pooling effects (Krugman 1991, Venables 1998, Fujita et al. 1999), and all these factors are subject to significant distance decay effects (Fujita and Thisse, 1996). As costs increase with distance, high transport costs in a new economic geography framework would favour the dispersion of economic activity, whereas a drop in transport costs will encourage agglomeration. The level of interaction between firms would thus be greatest the lower the transportation costs and the lower the distance (Duranton and Puga, 2000: 547). The new economic geography approach also shares with most strands dealing with innovation the idea that the costs of the transmission of tacit knowledge and knowledge spillovers rise with distance (Audretsch and Feldman 1996, Narin et al. 1997), making the transmission of innovation across geographical distance costly and mainly achieved through pre-existent economic and research networks (Rodríguez-Pose 1999: 78). Finally the increasing importance accorded to transactions costs (Scott 1988) and untraded interdependencies (Storper 1997) implies that spatial proximity can lead to agglomeration economies and to significant cost reducing effects in the interaction among firms.

While, in many cases, the combination of transport and transaction costs, knowledge spillovers, and untraded interdependencies leads – as in Castells’ (1998) space of flows and similar approaches – to the agglomeration of economic activity in urban areas, the way of achieving this agglomeration varies significantly. Whereas in Castells’ framework agglomeration is the result of the interaction among firms sharing common functions, but often located in far away cities, in the approaches highlighting the role of transportation costs, spillovers and untraded interdependencies, agglomeration is achieved by the interaction of firms in nearby physical locations with the presence of a significant distance decay effect. When these theories are applied to the dynamics of M&As, this implies that in the former M&As are likely to be a fundamentally inter-urban phenomenon, in which the level of

economic affinity and the networking between cities would play a much greater part than distance. In the latter, in contrast, interaction between firms is likely to take place within large urban agglomerations and to be significantly affected by geographical distance.

3 Territorial distribution and dynamics of M&As in Germany

The number of studies testing these issues empirically is, however, relatively small. In this paper we will try to address these questions by looking at the dynamics of M&As² in Germany during the 1990s. Using the M&A Review database³, which contains geographical information about the 29,900 M&As that took place in Germany between 1990 and 1999, we study the 24,599 cases in which both firms involved in the transaction were located in Germany. The M&A Review database represents the most comprehensive record available for recent M&A activity in Germany, but it is not problem free. The main shortcoming of the data source is that, although the geographical location of the firms involved in the transaction is recorded, precious few cases contain any detailed information about the size of firms or about the economic volume of the transaction. Hence, any research conducted using this database is necessarily limited to the number of M&As occurring in different locations, since reliable, consistent, and comparable measures of the economic significance of different transactions are not always available.

In order to be able to map the location of all M&As in Germany, we assigned postcodes to each individual transaction⁴ and then allocated all M&As to the 40 German *Regierungsbezirke* (NUTS II) (see Annex 1), the administrative unit below the German *Länder*, according to where both the acquiring and the target firms were located.

Given the theoretical discussion presented in the previous section, our hypotheses are:

- (1) that the high levels of economic activity in large urban areas should be associated with high relative rates of M&As;
- (2) that market size and economic agglomeration are likely to be important in this process, leading to an increasing concentration of economic activity in the largest German cities;
- (3) that geographical distance – as well as other factors such as the local endowment of human capital, the concentration of R&D activities and of political power – may also matter in the dynamics of M&As.

The combination of these hypotheses implies that the wave of M&As in Germany during the 1990s would have led to the concentration of economic activity in large urban regions, with developed financial and/or real estate markets and a competitive socio-economic fabric. In the German context, this would mean that the large German metropoli hosting the main corporate and financial centres, such as Frankfurt, Düsseldorf, Munich, or Hamburg, as well as the top capital cities of the German *Länder* (*Landeshauptstädte*) would emerge as the winners from this process.

In order to test these hypotheses we first conduct an analysis of the relative frequency of transactions by *Regierungsbezirk*, taking into account the size of the region in terms of population, total GDP and total number of firms. Then we turn to the mapping of flows of M&A transactions from the main centres of economic activity. Finally, the factors behind the dynamics of M&A activity are studied by means of regression analyses, in which the number of M&As from each of the top German urban centres is regressed on a series of factors identified in the theoretical section.

3.1 Territorial distribution of M&As in Germany

In order to identify the main centres of M&As in Germany, we estimate three location quotients of M&A activity per region. The first index $MApR_{(comp)}-I$, represents an index of the M&As per region, standardized by number of companies in each region. It adopts the following formula:

$$MApR_{(comp)}-I = \frac{\sum_{t_0}^{t_1} MA_i / \sum_{t_0}^{t_1} C_i}{\sum_{t_0}^{t_1} MA_{Ger} / \sum_{t_0}^{t_1} C_{Ger}}$$

where MA depicts the absolute number of M&A transactions, C represents the total stock of taxable companies, t_0 and t_1 denote the period of analysis and i stands for the regional unit of analysis (*Regierungsbezirk*); Ger , finally, corresponds to the whole of Germany. The two remaining indices $MApR_{(gdp)}-I$ and $MApR_{(pop)}-I$ take the total regional GDP and the population as the standardizing variable:

$$MApR_{(gdp)}-I = \frac{\sum_{t_0}^{t_1} MA_i / \sum_{t_0}^{t_1} GDP_i}{\sum_{t_0}^{t_1} MA_{Ger} / \sum_{t_0}^{t_1} GDP_{Ger}}$$

$$MApR_{(pop)} - I = \frac{\sum_{t_0}^{t_1} MA_i / \sum_{t_0}^{t_1} POP_i}{\sum_{t_0}^{t_1} MA_{Ger} / \sum_{t_0}^{t_1} POP_{Ger}}$$

GDP denotes the regional GDP (in million ECU), and *POP* the size of the population (in thousands). In all indices the German average is equal to 1.

Figures 1 to 3 present the results of the analysis⁵. The results underline, as expected, that M&As are a fundamentally urban phenomenon, as shown by the strong concentration of M&As during the 1990s in the top German metropoli.

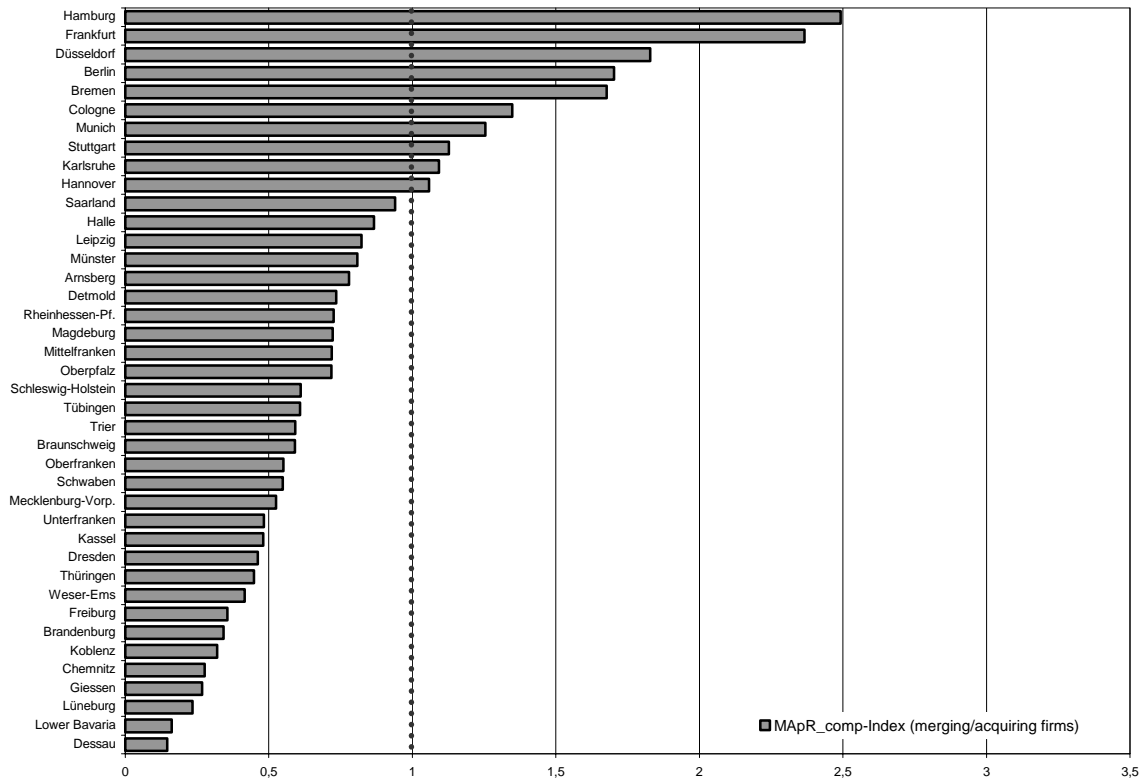


Figure 1. Territorial distribution of merging/acquiring firms in Germany, 1990-99
($MApR_{(comp)}-I$, standardized by *companies*; German average = 1)

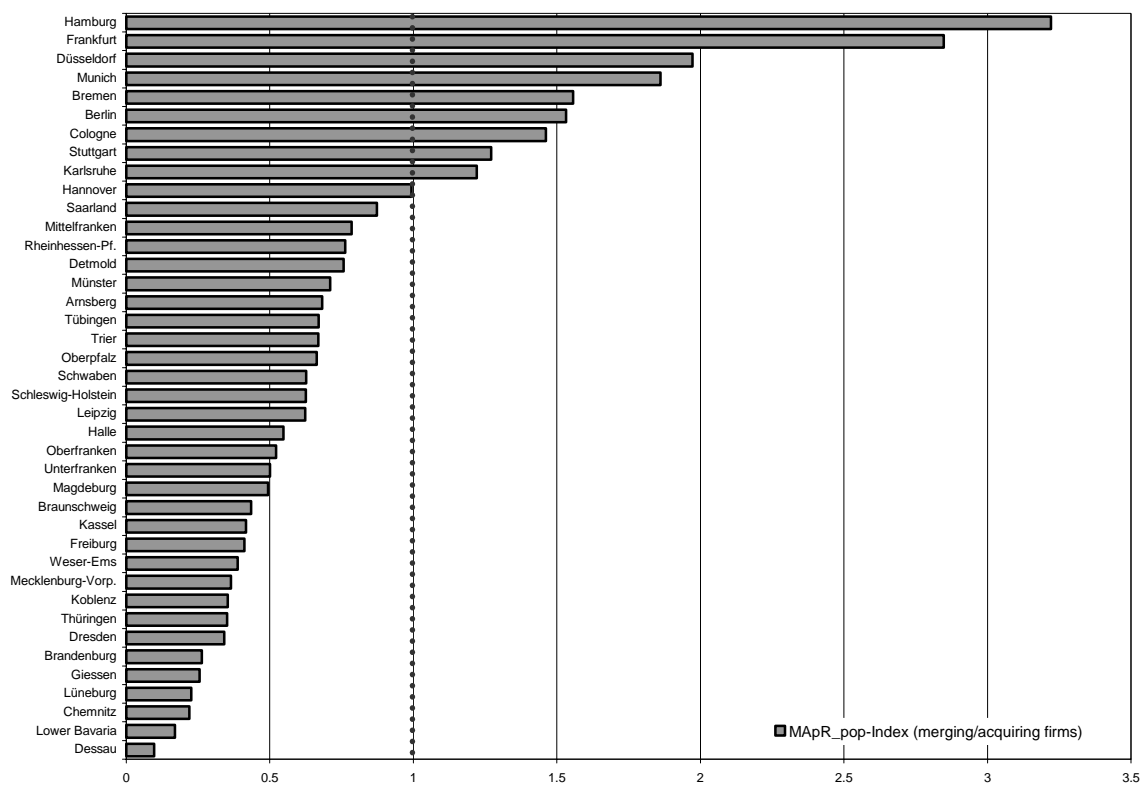


Figure 2. Territorial distribution of merging/acquiring firms in Germany, 1990-99
 $(MApR_{(pop)}-I$, standardized by *population per Regierungsbezirk*; German average = 1)

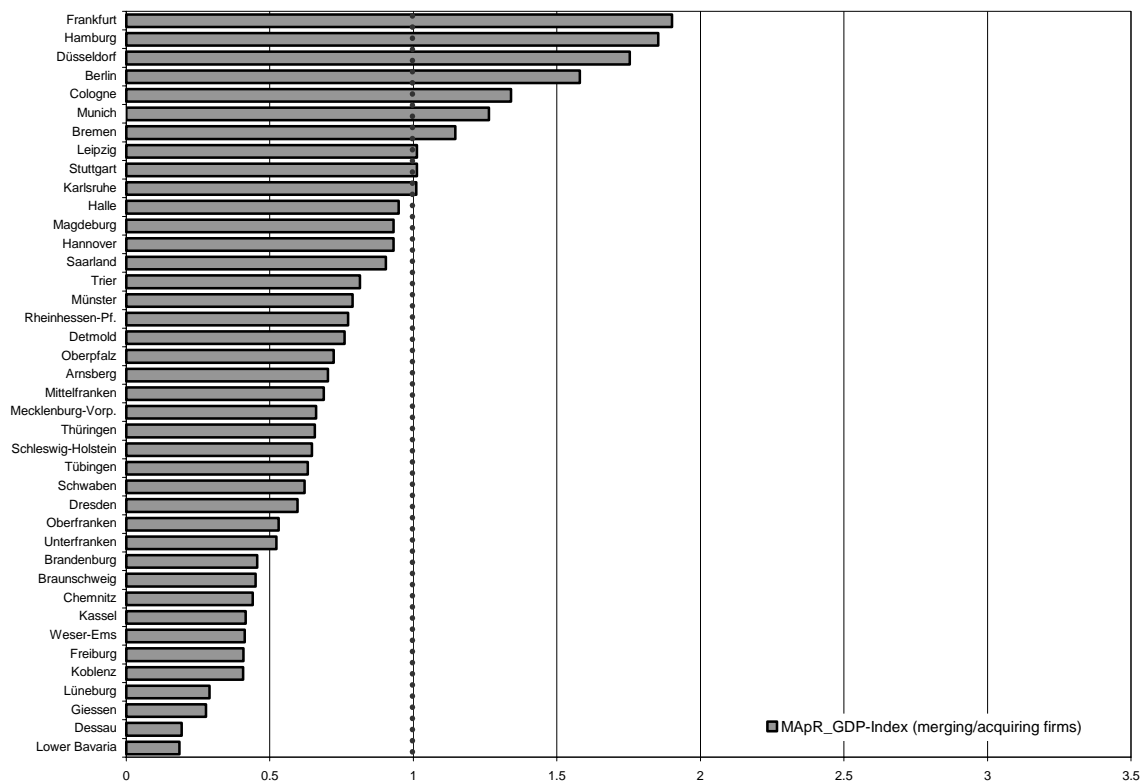


Figure 3. Territorial distribution of merging/acquiring firms in Germany, 1990-99
 $(MApR_{(gdp)}-I$, standardized by *regional GDP*; German average = 1)

Nine agglomerations perform above the German average in all three indices. These include Berlin, Bremen, Cologne, Düsseldorf, Frankfurt, Hamburg, Karlsruhe, Munich, and Stuttgart⁶. Hanover scores above the German average in one index ($MApR_{(comp)}-I$). None of the remaining thirty German *Regierungsbezirke* is above the German average in any of the indices. In the relatively rural regions which lack an articulating urban pole, such as Lower-Bavaria, Lüneburg, or Dessau, the incidence of M&As tends to be lower than one fifth of the German average.

There are, however, important differences in the relative incidence of M&As among the top German metropoli. Frankfurt, Hamburg, and Düsseldorf are by far the greatest poles of M&A activity. They appear as the top three agglomerations in the three indices, and Hamburg's and Frankfurt's scores are more than twice the German average when M&As are weighted by the number of companies and the total GDP of the region. Other large cities, such as Karlsruhe and Stuttgart, in contrast, barely exceed the German average in the three indices. Frankfurt, Hamburg, and Düsseldorf are followed by the German capital, Berlin, and by Munich and Cologne⁷ (see Figure 3). These six cities account for almost 55% of all M&As that took place in Germany between 1990 and 1999, and it is by no means a coincidence that precisely these six cities are regarded as the only German cities in the world city network (Taylor 2000b: 10). If Bremen, Hanover, Karlsruhe, and Stuttgart are included the percentage of German M&As concentrated in the top ten German cities increases to 69%.

An intra-regional analysis of M&As indicates an even greater concentration of economic activity. Most of the transactions take place within the municipal boundaries of the core city with a relatively small percentage in the regional hinterland. Even if Berlin, Bremen, and Hamburg – where all M&As are concentrated in the city-region – are not included, a strong agglomeration of M&A activities in core areas is also evident. Munich hosts 82% of all M&As that take place in the *Regierungsbezirk* of Upper-Bavaria, the city of Hanover 80% of those taking place in its region, and 62% of the acquiring firms in the Darmstadt region are located in Frankfurt. The main exceptions to the rule are those regions where more than one key urban centre can be identified. This is the case of Düsseldorf (with secondary M&As centres in Essen and Duisburg), Cologne (Bonn), and Karlsruhe, where the main centre is located in Mannheim. Even so, the city of Cologne witnessed almost 50% and Düsseldorf almost 40% of M&As in their respective region. In addition, there seems to be a strong distance decay effect, since neighbouring regions do not particularly benefit from their proximity to large agglomerations. The *Regierungsbezirke* of Giessen (next to Frankfurt),

Lower-Bavaria (Munich), Brandenburg (Berlin), Freiburg (Stuttgart), Lüneburg (Hamburg), or Koblenz (located between Cologne and Frankfurt) are some of the regions with the lowest M&A indices.

In light of these results, it could be claimed that M&As in Germany are not just an urban phenomenon, but one that is increasingly concentrated in large metropolitan areas. With the exception of the period between 1990 and 1994, when firms in the *New Länder* of the former East Germany became the target of a flurry of acquisitions in the wake of German reunification (Zademach 2001), there has been a growing tendency for M&As to take place in the largest German metropoli. These results confirm those reached by other authors using case study analyses, which identify Frankfurt as the dominant centre for M&A in Germany with Düsseldorf, Munich, Berlin, Stuttgart, and Cologne as additional centres (Lo 2000: 7-8). Assuming that the merger of two companies and the acquisition of a company by another involves a shift in terms of decision making structures, the results of the analysis corroborate the view that the recent wave of M&As in Germany is fostering a systematic concentration of corporate control in the main German metropoli.

3.3 Dynamics of M&A: the flows of transactions

The following section discusses in greater detail the dynamics of the concentration of firms and corporate control and decision making structures in the six main centres of M&As in Germany. We have mapped the flows of M&As in Germany in the 1990s, taking all the acquiring firms located in Frankfurt, Düsseldorf, Hamburg, Berlin, Munich, and Cologne as the starting point and analysing where the target firms are placed. The results of this exercise are presented in Figure 4.

Three important facts emerge from the analysis. First and foremost is that a large proportion of M&As takes place within the same agglomeration. In the six cases examined the proportion of transactions in which the acquiring and the target firm are both located in the same region hovers between 20% and 30%. This percentage is greater in Berlin, Hamburg, and Munich, where the share of transactions taking place within the metropolitan area is close to 30% (Figure 4) and in Bremen, where it reaches 40%. In the three remaining cities depicted in Figure 4, as well as in Stuttgart and Hanover, the share of intra-regional transactions is between 21 and 25%. If all M&As that took place in Germany between 1990 and 1999 are considered, the proportion rises slightly above 30% (Zademach 2001).

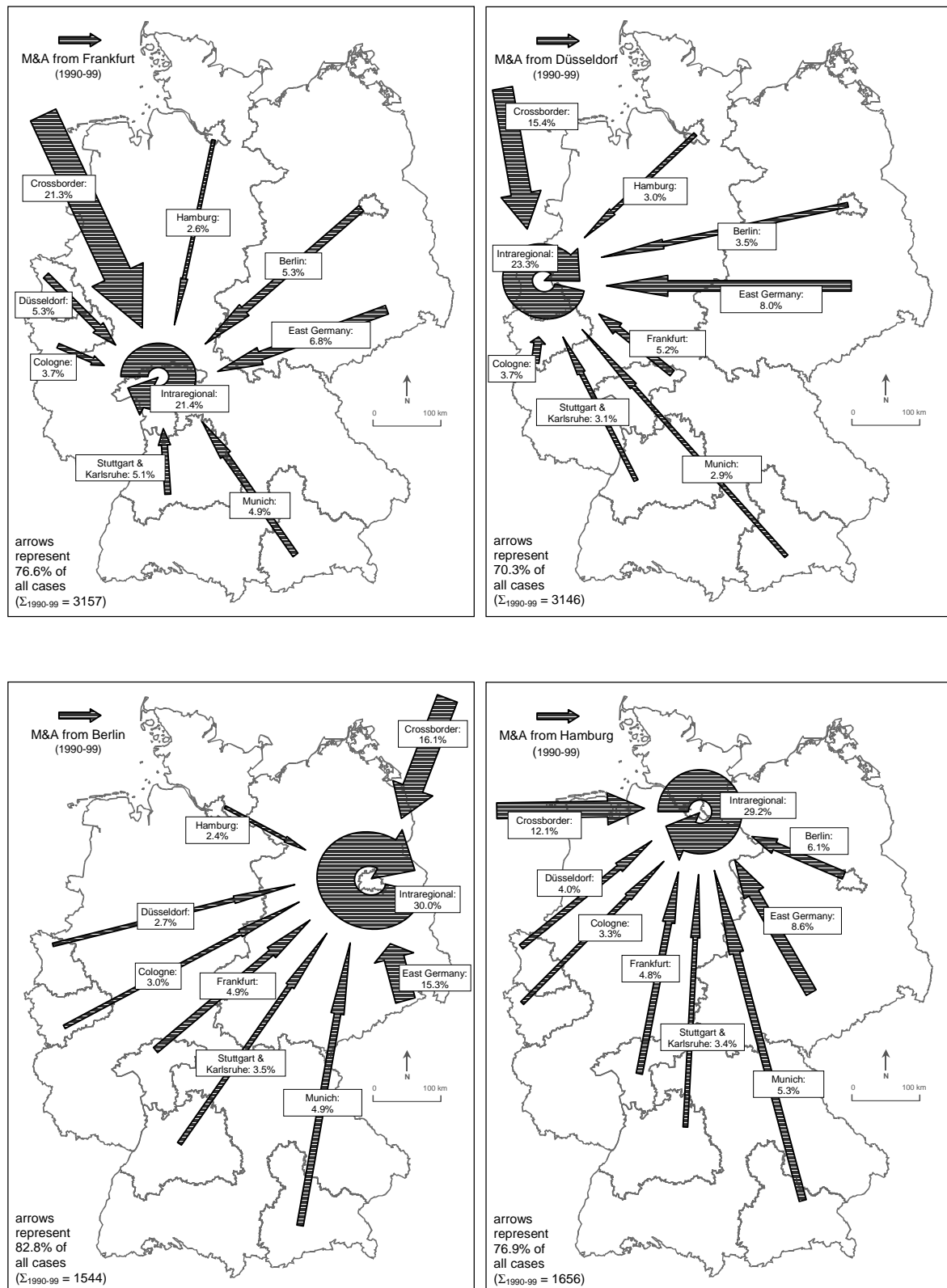


Figure 4. Spatial distribution of M&A targets acquired from the most important German metropoli (1)

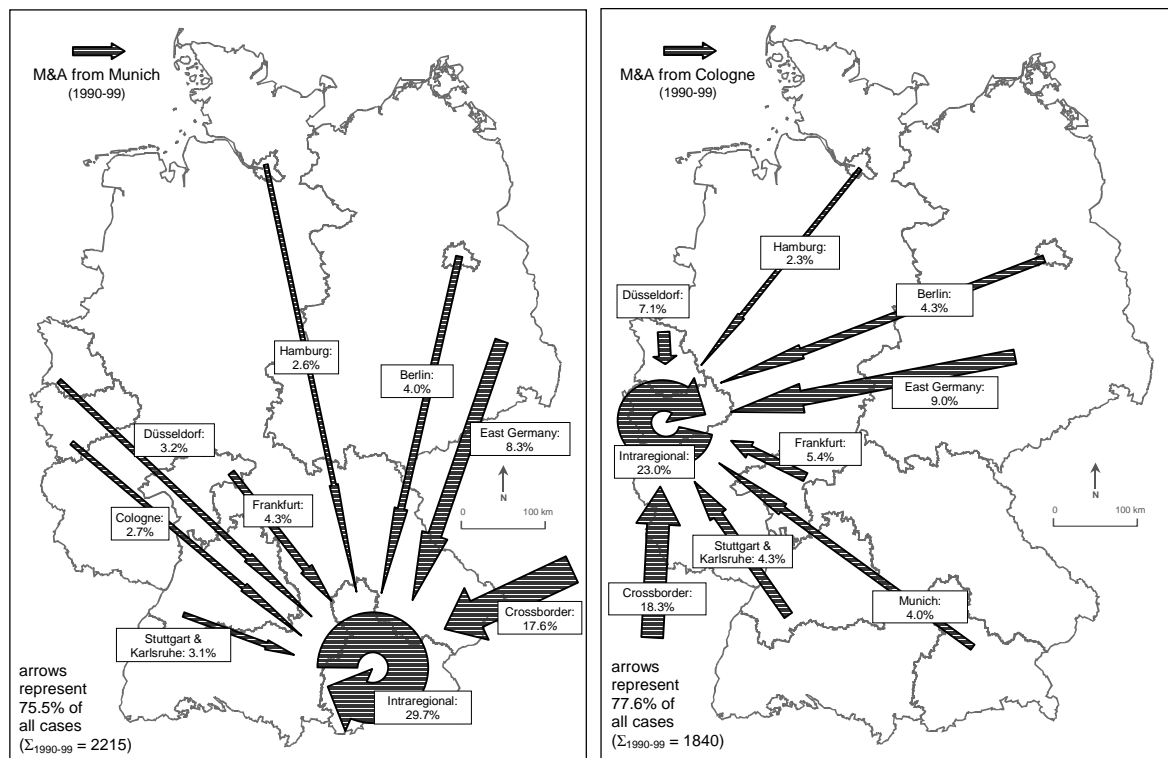


Figure 4. Spatial distribution of M&A targets acquired from the most important German metropoli (continued)

A second factor stemming from Figure 4 is the considerable degree of interconnectivity between the most important metropolitan areas. A significant share of all transactions takes place among the key German nodes of M&As. As a general rule, between 2 and 5% of the firms that have been acquired by local firms in the six largest German M&As centres were located in another of the five large urban agglomerations or in Stuttgart and Karlsruhe. As a whole, the transactions involving just the seven most important German M&As centres account for close to 50% of the overall level of M&As activity in each of these cities during the 1990s. This share rises to more than 56% in the case of Hamburg.

The final fact is the considerable and growing number of M&As involving German corporations where the target firm is foreign. Frankfurt has the greatest share of cross border transactions, with more than one fifth of M&As involving foreign firms (Figure 4). In the remaining five cities the proportion of cross-border M&As is between 12 and 18% of the total. Outside the main centres the figures are similar. The proportion of cross-border transactions in Stuttgart and in Karlsruhe is close to 19% of the total M&As. Cross-border M&As also became more important as the decade progressed. A sharp increase in the cross-border M&A activity can be reported in all of the six cities included in Figure 4. In Frankfurt the proportion of cross-border transactions grew from levels of 19.4% in 1990, to over 24% in

1995, and 30.4% in 1999. In Berlin cross-border transactions represented 11.3% in 1990, 18.9% in 1995, and 32.6% at the end of the period of analysis. The German case confirms Chapman and Edmond's view for the whole of Europe that 'the number of cross-border deals has increased more rapidly than domestic transactions and there is no doubt that this activity has been at historically high levels over the last 10 years' (2000: 754).

Figure 4, in combination with the evidence from the previous section, shows that the dynamics of M&As in Germany seem to be stressing the emergence of some of the features of an 'archipelago economy', in which corporate control becomes increasingly concentrated in a few key locations, whose economic connection with its immediate hinterland is rather limited. In order to assess whether this picture is entirely correct, we now turn to the factors lying behind the identified patterns of M&As.

4 The factors shaping the geography of M&As in Germany

In this section, we address in greater detail which are the factors shaping the new geography of M&As in Germany. In order to achieve this goal we first regress the number of M&A transactions taking place from the core urban metropolitan areas on a set of independent variables which reflect the arguments outlined in the theoretical section. This is followed by a stepwise multiple regression analysis in which the main indicators behind the dynamics of M&As in Germany are considered in combination.

4.1 Individual regressions: agglomeration vs. proximity

Which factors explain the distinct and increasing concentration of corporate control in the most important German metropoli? In the theoretical section it was outlined that different strands of research have pointed out to diverse factors as the main drivers of the concentration of economic activity. Agglomeration, physical proximity, distance, the level of urbanisation, political power, and a host of local characteristics were among the elements highlighted by most approaches to the concentration of economic activity. In order to check the relevance of these factors, we construct a series of indicators in order to test what is their individual relationship with the number of M&As taking place from each of the main German urban regions. These indicators are introduced in the following model:

$$\ln M\&A_{itf-t0} = f \{ \text{samereg}, \text{neighreg}, \ln \text{dist}, \ln GDP_{t0}, \ln GDP/cap_{t0}, \ln POP_{t0}, \text{agriculture}_{t0}, \\ \text{industry}_{t0}, \text{services}_{t0}, \text{education}_{t0}, R\&D_{t0}, \text{unemploy}_{t0}, \text{capital} \}$$

in which the number of M&As taking place between region i and each of the remaining German regions (with the acquiring firm being located in region i) during the period of analysis t (1990-99) is a function of a series of indicators representing agglomeration, geographical distance, and the socio-economic and political characteristics of individual regions. The agglomeration independent variables include the dummy variable *samereg*, which controls for the fact, stressed in the previous section, that a large percentage of M&As take place within the same region. Other proxies for agglomeration include the total regional GDP (*GDP*) and the total population (*POP*) in 1991. Geographical distance is captured by two variables: *neighreg* is a dummy variable representing the *Bezirke* that share borders with the region being analysed, and *dist*, which depicts the geographical distance by the shortest road route between the main cities in the regions included in the analysis. Finally a series of other independent variables represent some of the basic characteristics of individual regions. The overall level of prosperity at the beginning of the period of analysis is captured by the initial GDP per capita (*GDP/cap*). The three variables *agriculture*, *industry*, and *services* represent the respective proportion of employees in each sector at the beginning of the period. *Agriculture* also acts as a proxy for the degree of rurality of a region. *Education* stands for the share of the population with a university degree in 1995, *R&D* depicts the investment in R&D in % of regional GDP in 1996⁸, *unemploy* stands for the unemployment rate (in %) and *capital* is a trichotomous dummy variable, with the value of 0 given to regions that do not host the capital of the Land, 1 to regions where the *Landeshauptstadt* is located, and 2 to the German capital, Berlin. This last variable represents a proxy for the concentration of political power.

Data in the analysis stem from the European Statistical Office (Eurostat) and from the German *Statistisches Bundesamt*. Natural logarithms for some of the independent variables (*GDP*, *POP*, and *GDP/cap*), as well as for the dependent variable, are used in order to avoid problems of non-linearity. The regressions are conducted including all forty German regions with the *samereg* independent variable, and excluding the region for which the analysis is taking place in all other cases.

The outcome of regressing the number of M&As in which a firm from Frankfurt, Düsseldorf, Berlin, Hamburg, Munich, or Cologne was involved as the acquiring firm between 1990 and 1999 on the individual independent variables is presented in Table 1 (and those for Stuttgart, Hanover, Bremen, and Karlsruhe in Annex 2). These results confirm the importance of intraregional transactions. In all cases, *samereg* has a positive and highly

Table 1. M&As taking place from the six most important German metropolis regressed on the independent variables (1)

a.) Frankfurt

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.456***	3.113	0.209	1,38
without <i>samereg</i>	<i>neighreg</i>	- 0.009	- 0.053	0.000	1,37
	<i>ln dist</i>	- 0.069	- 0.419	0.005	1,37
	<i>ln GDP</i>	0.739***	6.678	0.547	1,37
	<i>ln GDP/cap.</i>	0.347***	2.252	0.121	1,37
	<i>ln POP</i>	0.782***	7.627	0.611	1,37
	<i>% agriculture</i>	- 0.609***	- 4.666	0.370	1,37
	<i>% industry</i>	- 0.185	- 1.145	0.034	1,37
	<i>% services</i>	0.433***	2.921	0.187	1,37
	<i>education</i>	0.175	1.083	0.031	1,37
	<i>investment in R&D</i>	0.532***	3.817	0.283	1,37
	<i>unemployment</i>	- 0.202	- 1.256	0.041	1,37
	<i>capital city (political power)</i>	0.476***	3.289	0.226	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

b.) Düsseldorf

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.513***	3.682	0.263	1,38
without <i>samereg</i>	<i>neighreg</i>	0.497***	3.484	0.247	1,37
	<i>ln dist</i>	- 0.414***	- 2.766	0.171	1,37
	<i>ln GDP</i>	0.700***	5.966	0.490	1,37
	<i>ln GDP/cap.</i>	0.293*	1.863	0.086	1,37
	<i>ln POP</i>	0.793***	7.910	0.628	1,37
	<i>% agriculture</i>	- 0.621***	- 4.813	0.385	1,37
	<i>% industry</i>	- 0.304*	- 1.944	0.093	1,37
	<i>% services</i>	0.537***	3.876	0.289	1,37
	<i>education</i>	0.222	1.382	0.049	1,37
	<i>investment in R&D</i>	0.402**	2.672	0.162	1,37
	<i>unemployment</i>	- 0.039	- 0.239	0.002	1,37
	<i>capital city (political power)</i>	0.456***	3.114	0.208	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

c.) Berlin

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.444***	3.056	0.197	1,38
without <i>samereg</i>	<i>neighreg</i>	0.274*	1.732	0.075	1,37
	<i>ln dist</i>	- 0.232	- 1.449	0.054	1,37
	<i>ln GDP</i>	0.442***	3.001	0.196	1,37
	<i>ln GDP/cap.</i>	- 0.045	- 0.272	0.002	1,37
	<i>ln POP</i>	0.724***	6.391	0.525	1,37
	<i>% agriculture</i>	- 0.278*	- 1.763	0.078	1,37
	<i>% industry</i>	- 0.180	- 1.114	0.032	1,37
	<i>% services</i>	0.288*	1.830	0.083	1,37
	<i>education</i>	0.492***	3.437	0.242	1,37
	<i>investment in R&D</i>	0.454***	3.103	0.206	1,37
	<i>unemployment</i>	0.137	0.843	0.019	1,37
	<i>capital city (political power)</i>	0.578***	4.312	0.334	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

Table 1. M&As taking place from the six most important German metropolis regressed on the independent variables (2)

d.) Hamburg

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.432***	2.955	0.187	1,38
without <i>samereg</i>	<i>neighreg</i>	0.115	0.703	0.013	1,37
	<i>ln dist</i>	- 0.264	- 1.662	0.069	1,37
	<i>ln GDP</i>	0.624***	4.855	0.389	1,37
	<i>ln GDP/cap.</i>	0.199	1.233	0.039	1,37
	<i>ln POP</i>	0.759***	7.087	0.576	1,37
	% <i>agriculture</i>	- 0.428***	- 2.883	0.183	1,37
	% <i>industry</i>	- 0.337**	- 2.178	0.114	1,37
	% <i>services</i>	0.507***	3.577	0.257	1,37
	<i>education</i>	0.278*	1.761	0.077	1,37
	<i>investment in R&D</i>	0.459***	3.144	0.211	1,37
	<i>unemployment</i>	0.005	0.029	0.000	1,37
	<i>capital city (political power)</i>	0.574***	4.265	0.330	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

e.) Munich

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.486***	3.432	0.237	1,38
without <i>samereg</i>	<i>neighreg</i>	0.176	1.090	0.031	1,37
	<i>ln dist</i>	- 0.184	- 1.141	0.034	1,37
	<i>ln GDP</i>	0.540***	3.907	0.292	1,37
	<i>ln GDP/cap.</i>	0.176	1.088	0.031	1,37
	<i>ln POP</i>	0.648***	5.177	0.420	1,37
	% <i>agriculture</i>	- 0.398**	- 2.642	0.159	1,37
	% <i>industry</i>	0.091	0.554	0.008	1,37
	% <i>services</i>	0.097	0.594	0.009	1,37
	<i>education</i>	0.256	1.608	0.065	1,37
	<i>investment in R&D</i>	0.380**	2.499	0.144	1,37
	<i>unemployment</i>	- 0.045	- 0.274	0.002	1,37
	<i>capital city (political power)</i>	0.407***	2.711	0.166	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

f.) Cologne

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.480***	3.376	0.231	1,38
without <i>samereg</i>	<i>neighreg</i>	0.187	1.158	0.035	1,37
	<i>ln dist</i>	- 0.235	- 1.473	0.055	1,37
	<i>ln GDP</i>	0.586***	4.395	0.343	1,37
	<i>ln GDP/cap.</i>	0.150	0.925	0.023	1,37
	<i>ln POP</i>	0.754***	6.972	0.556	1,37
	% <i>agriculture</i>	- 0.479***	- 3.317	0.229	1,37
	% <i>industry</i>	- 0.088	- 0.535	0.008	1,37
	% <i>services</i>	0.287*	1.826	0.083	1,37
	<i>education</i>	0.367**	2.397	0.134	1,37
	<i>investment in R&D</i>	0.423***	2.841	0.179	1,37
	<i>unemployment</i>	0.045	0.272	0.002	1,37
	<i>capital city (political power)</i>	0.529***	3.792	0.280	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

significant association with the number of M&As. The standardized β -coefficients always exceed 0.4 and reach 0.5 in Düsseldorf (0.513) and Bremen (0.558). This confirms the fact that firms searching for other firms to acquire or to merge with often tend to look for firms located in the same city and/or region.

The variable representing neighbouring regions indicates that regional borders matter in the geography of German M&As. *Neighreg* tends to be not significant in most cases. These include Frankfurt, Hamburg, Munich, Cologne, and Hanover and, to a lesser extent, Berlin. Düsseldorf represents the only exception to the rule among the top six German corporate centres (Figure 1) with Bremen, Karlsruhe, and Stuttgart also displaying positive and significant coefficients (Annex 2). In the case of Düsseldorf, the attraction of companies in neighbouring regions for local companies is possibly related to the location of some key economic centres, such as Bonn, Cologne, or Dortmund on its borders. Karlsruhe and Stuttgart are in a similar situation, since they both border the *Regierungsbezirk* of Darmstadt, the region where Frankfurt is located.

The lack of relevance of geographical proximity when considered as an individual variable in the dynamics of German M&As is reinforced when introducing the road distance between acquiring and target firm in the regression. As in the case of *neighreg*, *dist* is not robust in the majority of the top German M&As centres. No significant distance decay effect is observed in the M&As taking place from Frankfurt, Berlin, Hamburg, Munich, Cologne, or Hanover (Table 1 and Annex 2). Düsseldorf, Bremen, Karlsruhe, and Stuttgart are again the exceptions (Table 1 and Annex 2). These results suggest that, as a general rule, geographical proximity and being close to one of the large metropolitan areas has little or no influence on the behaviour of firms when looking for other firms to acquire or merge with. The main exception is being located in the same urban region, but in this case the significance of the results may be attributed to a series of factors related to economic agglomeration and clustering rather than simply to physical distance.

Economic agglomeration, in contrast, matters for M&As. The larger the size of the agglomeration in terms of total GDP or population plays an important part in determining where the target firms are located. Both the original GDP and population of the target firm's region are highly robust variables in explaining the choice of partners and targets by acquiring firms. The population of the target region is positive and highly significant in every single case. It is the strongest variable in all cases bar Bremen and explains, as a general rule, more

than 50% of the variance. *GDP* is also positive and significant in all regressions, with the exception of Bremen and Karlsruhe (Table 1 and Annex 2).

The association between the specific socio-economic features of individual regions and the dynamics of M&As in Germany varies across independent variables. With respect to the sectoral division of labour, whereas the share of employment in industry in the target regions generally bears no significant connection with M&As, employment in services and in agriculture are, for most cities, robust. Employment in services in the target region is positively associated with decisions to acquire or merge in the region of origin. The share of employment in agriculture – which can also be interpreted as a proxy for rurality – is, as expected, negatively associated with M&As. R&D investment has in all cases positive and significant coefficients. The overall level of education of the population of a target region is only positively connected to the number of M&As from Berlin, Hamburg, Cologne, Hanover, and Karlsruhe, but not from the remaining cities. The coefficients of the unemployment rates in target regions tend to be insignificant and vary sign across regressions. And the regional GDP per capita tends to be insignificant, with the exception of M&As taking place from Frankfurt and, to a lesser extent, from Düsseldorf and Stuttgart. Finally, the presence of a *Land* capital or of the federal capital, Berlin, in the target region – with its implications in the form of the concentration of political decision-making capacity – has a robust and positive connection with the number of M&As to that region from every single major M&As node in Germany.

This analysis of individual variables presents a panorama close to that pictured by Sassen, Taylor, and Veltz. The dynamics of M&As in Germany during the 1990s seem to have led not just to a greater concentration of economic activity in the main urban metropoli, but also to a greater economic interaction among large urban centres, with neighbouring and rural regions playing almost no part in the process. Hence, the results seem to support, once again, the hypothesis of the emergence of an ‘archipelago economy’.

4.2 Multiple regression analysis

Does this image of an ‘archipelago economy’ hold, however, when instead of considering the relationship between dependent and independent variables individually, the interaction among independent variables is taken into account in a multiple regression analysis? In this section, we perform a stepwise multiple regression analysis for the M&As performed from the

same urban economic centres and including the same independent variables. For different reasons some variables have been taken out of this part of the analysis. *Samereg* has been excluded in order to prevent the distortion that the high percentage of intraregional M&As would provoke. As a consequence, the analysis only takes into account the M&As from one region to the remaining 39 German regions. The dummy for neighbouring regions (*neigh*) has been dropped, since the inclusion of the geographical distance between the main cities is a more accurate indicator of proximity. A strong level of multicollinearity between *POP* and *GDP* prevents the introduction of both variables together in regressions. *POP*, which is a more significant variable, has been chosen, although the results of the analysis including *GDP* and *dist* are also reported. Since *agriculture* and *services* are often the two sides of the same coin, only the first variable is considered. The model adopts the following form:

$$\ln M\&A_{itf-10} = \alpha + \beta_1 \ln dist + \beta_2 \ln POP + \beta_3 \ln capital + \beta_4 agriculture + \beta_5 education + \beta_6 R\&D + \beta_7 unemploy + \varepsilon$$

Table 2 reports the results of the analysis for all M&As taking place from the six key German economic centres (the results for Bremen, Hanover, Karlsruhe, and Stuttgart are presented in Annex 3).

The results of the first two models, in which the number of M&As taking place from each city is regressed on distance as well as on one of the measures of agglomeration (*POP* in model 1 and *GDP* in model 2), confirm the importance of agglomeration as a driver of M&As in Germany. The size of the target region, both in terms of population and total GDP, is an important explanatory factor in the geography of M&As. The findings also reveal a much more complex role played by geographical distance than implied by the individual regressions. When considered in conjunction with population as an agglomeration indicator (Model 1), geographical distance becomes significant at the 1% level in all cases, except Frankfurt. The existence of a distance decay effect is also evident in connection to GDP as an agglomeration variable (Model 2), even though in this model the number of exceptions also include the main southern German nodes of Munich, Stuttgart, and Karlsruhe (Table 2 and Annex 3). These results highlight that, once agglomeration is controlled for, firms searching for partners to merge with and for other firms to acquire tend to look in nearby rather than in distant locations. Hence, in combination with agglomeration, M&A activity increases with spatial proximity. This result introduces important nuances in the perception of the panorama

Table 2. Explaining M&A activity in the key German nodes of M&A (1)**a.) Results of the multiple regression analysis in Frankfurt**

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.115 (-1.122)	0.068 (0.600)	-0.212** (-2.108)	-0.092 (-0.961)	-0.052 (-0.531)
<i>ln POP</i>	0.789*** (7.707)	-	0.685*** (6.757)	0.576*** (6.041)	0.475*** (4.949)
<i>ln GDP</i>		0.752*** (6.619)	-	-	-
<i>capital city (political power)</i>			0.297*** (2.752)	0.241** (2.490)	0.211** (2.209)
<i>% agriculture</i>				-0.320*** (-3.304)	-0.367*** (-3.456)
<i>education</i>					0.318** (2.100)
<i>investment in R&D</i>					0.001 (0.011)
<i>unemployment</i>					-0.304** (-2.239)
<i>Constant</i>	-6.535*** (-3.643)	-7.103*** (-3.375)	-4.209** (-2.271)	-3.462** (-2.096)	-3.108* (-2.015)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	29.923	22.094	26.114	27.865	19.683
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.624	0.551	0.691	0.766	0.816
Adj. R ²	0.604	0.526	0.665	0.739	0.775

Notes: t-statistics in parentheses
 ***, **, and * indicate significance at the 1, 5, and 10% level respectively

b.) Results of the multiple regression analysis in Düsseldorf

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.275*** (-2.966)	-0.205* (-1.687)	-0.392*** (-4.650)	-0.293*** (-3.598)	-0.344*** (-3.896)
<i>ln POP</i>	0.741*** (7.994)	-	0.596*** (6.830)	0.535*** (6.671)	0.504*** (5.437)
<i>ln GDP</i>		0.633*** (5.212)	-	-	-
<i>capital city (political power)</i>			0.343*** (3.871)	0.295*** (3.662)	0.225*** (2.679)
<i>% agriculture</i>				-0.254*** (-3.146)	-0.326*** (-3.580)
<i>education</i>					0.227 (1.607)
<i>investment in R&D</i>					-0.086 (-0.903)
<i>unemployment</i>					-0.014 (-0.117)
<i>Constant</i>	-3.168** (-2.106)	-1.552 (-0.805)	-0.603 (-0.419)	-0.351 (-0.273)	-0.203 (-0.143)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	42.273	20.108	44.123	43.979	28.010
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.701	0.528	0.791	0.838	0.863
Adj. R ²	0.685	0.501	0.773	0.819	0.833

Notes: t-statistics in parentheses
 ***, **, and * indicate significance at the 1, 5, and 10% level respectively

Table 2. Explaining M&A activity in the key German nodes of M&A (2)**c.) Results of the multiple regression analysis in Berlin**

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.325*** (-3.182)	-0.630*** (-4.511)	-0.250** (-2.616)	-0.292*** (-2.861)	-0.169 (-1.151)
<i>ln POP</i>	0.764*** (7.472)	-	0.651*** (6.527)	0.613*** (5.862)	0.536*** (5.194)
<i>ln GDP</i>		0.769*** (5.505)	-	-	-
<i>capital city (political power)</i>			0.306*** (3.029)	0.297*** (2.946)	0.244** (2.568)
<i>% agriculture</i>				-0.120 (-1.141)	-0.133 (-1.188)
<i>education</i>					0.314* (2.005)
<i>investment in R&D</i>					0.082 (0.690)
<i>unemployment</i>					-0.083 (-0.522)
<i>Constant</i>	-6.988*** (-3.483)	-1.995 (-1.048)	-6.217 (-3.399)	-4.835* (-2.210)	-6.741** (-2.236)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	30.522	17.032	28.028	21.527	16.221
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.629	0.486	0.706	0.717	0.786
Adj. R ²	0.608	0.458	0.681	0.684	0.737

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

e.) Results of the multiple regression analysis in Hamburg

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.207* (-2.000)	-0.261** (-2.122)	-0.182* (-1.941)	-0.182* (-1.964)	-0.220** (-2.170)
<i>ln POP</i>	0.743*** (7.194)	-	0.623*** (6.126)	0.567*** (5.193)	0.521*** (4.292)
<i>ln GDP</i>		0.623*** (5.070)	-	-	-
<i>capital city (political power)</i>			0.315*** (2.994)	0.305*** (3.023)	0.270** (2.403)
<i>% agriculture</i>				-0.134 (-1.324)	-0.090 (-0.712)
<i>education</i>					0.067 (0.363)
<i>investment in R&D</i>					0.153 (1.117)
<i>unemployment</i>					-0.046 (-0.276)
<i>Constant</i>	-7.785*** (-3.708)	-4.211* (-1.868)	-6.312*** (-3.216)	-5.108** (-2.382)	-4.550* (-1.847)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	29.154	15.155	26.721	20.910	12.357
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.618	0.457	0.696	0.711	0.736
Adj. R ²	0.597	0.427	0.670	0.677	0.677

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

Table 2. Explaining M&A activity in the key German nodes of M&A (3)**e.) Results of the multiple regression analysis in Munich**

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.315** (-2.674)	-0.211 (-1.555)	-0.400*** (-3.503)	-0.453*** (-4.083)	-0.571*** (-4.396)
<i>ln POP</i>	0.707*** (5.990)	-	0.607*** (5.236)	0.512*** (4.343)	0.544*** (4.447)
<i>ln GDP</i>		0.551*** (4.052)	-	-	-
<i>capital city (political power)</i>			0.315** (2.615)	0.319*** (2.787)	0.208* (1.742)
<i>% agriculture</i>				-0.253** (2.210)	-0.406*** (-2.918)
<i>education</i>					0.171 (0.907)
<i>investment in R&D</i>					-0.093 (-0.685)
<i>unemployment</i>					0.174 (0.929)
<i>Constant</i>	-4.238** (-2.180)	-2.258 (-1.001)	-2.129 (-1.077)	0.234 (0.109)	0.115 (0.055)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	19.203	9.131	17.158	15.517	10.600
Significance (F)	0.000	0.001	0.000	0.000	0.000
R ²	0.516	0.337	0.595	0.646	0.705
Adj. R ²	0.489	0.300	0.561	0.604	0.639

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

f.) Results of the multiple regression analysis in Cologne

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.308*** (-3.064)	-0.341** (-2.647)	-0.385*** (-3.858)	-0.351*** (-3.400)	-0.443*** (-4.842)
<i>ln POP</i>	0.664*** (6.610)	-	0.543*** (5.072)	0.511*** (4.656)	0.415*** (4.036)
<i>ln GDP</i>		0.481*** (3.737)	-	-	-
<i>capital city (political power)</i>			0.248** (2.413)	0.232** (2.245)	0.106 (1.113)
<i>% agriculture</i>				-0.120 (-1.181)	-0.193* (-1.916)
<i>education</i>					0.422*** (2.846)
<i>investment in R&D</i>					0.014 (0.125)
<i>unemployment</i>					-0.091 (-0.715)
<i>Constant</i>	-5.316*** (-3.010)	-1.660 (-0.788)	-3.279* (-1.760)	-2.781 (-1.463)	-2.602 (-1.506)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	36.572	16.282	29.502	22.717	20.838
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.664	0.468	0.711	0.722	0.820
Adj. R ²	0.646	0.439	0.687	0.690	0.781

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

of M&As as an ‘archipelago economy’ and brings the geography of German M&As closer to the strands of economic geographers such as Storper or geographical economists such as Krugman who emphasize that, despite the fact that agglomeration may be considered as one of the most important factor shaping economic activity, distance decay effects can be identified in economic relationships.

The proxy for political power (*capital*) in Model 3 is robustly associated with the number of M&As between any two regions. This implies that firms not only tend to look for firms to acquire or merge within large urban and not too distant areas, but also preferably in those regions where economic and political powers concur.

The introduction of socio-economic variables in models 4 and 5 does not significantly alter the results (Table 2 and Annex 3). Employment in agriculture, for example – which was in most cases significant in the individual regressions – becomes a less important factor in target regions. When considered in combination with other variables, the level of employment in agriculture and the rurality of a region is not a significant element in the M&As taking place from Berlin, Hamburg, Cologne, Bremen, or Karlsruhe. Only M&As originated in Frankfurt, Düsseldorf, Munich, and Stuttgart seem to be affected by the sectoral specialisation of the target region. The unemployment rate also is not significant in nine out of the ten cases considered. The endowment of human capital in target regions is only significant in three out of ten, with Berlin as a borderline case. But the most remarkable change with respect to the individual regressions is the robustness of investment in R&D. This variable was positively associated with the number of M&As and significant in almost every single individual regression presented in the previous section. Yet, when considered in conjunction with other factors, the technology effort of target regions becomes irrelevant for companies looking for a firm to acquire or merge with in other regions in every single one of the regressions.

The loss of significance of many of the variables representing socio-economic characteristics with respect to the simple regression analysis implies that, given the robustness of the agglomeration indicators, factors such as the educational endowment of the population or the specialisation in R&D, as well as many other regional characteristics, seem to be encompassed in the level of agglomeration of the target region.

As a whole, the geography of M&As in Germany during the 1990s is basically explained by the combination of agglomeration, distance, and political power of Model 3. The three variables included in this model explain in all cases two thirds of the variance in the

dependent variable. The introduction of additional variables in Models 4 or 5 does not significantly increase the explanatory capacity of the model. The only exception is related to the M&As taking place from Frankfurt, the economic centre that exhibits the highest level of openness as the national economic and financial centre (Wójcik, 2002: 886), since in this case variables such as the level of employment in agriculture, the human capital, and the rate of unemployment of target regions are robust, and, to a certain extent, cover for the lack of significance of geographical distance.

Conclusions

The aim of this paper has been to study the geography of M&As in Germany during the 1990s and to unravel the factors behind its dynamics. Three main conclusions can be extracted from the analysis. The first conclusion is that M&As are fundamentally a large city phenomenon and, thus, are contributing to the economic take-off of the main German metropoli. Regardless of how the geographical incidence of M&As is measured, the results show that the transactions taking place in the largest German cities far outweigh in relative terms all those taking place in other regions. The wave of M&As of the 1990s has hence contributed to a major concentration of firms, company headquarters, and economic activity in the key Germany metropoli. Second, it has been stressed that a large percentage of all M&A transactions take place within the same region or involve companies already located in large urban centres, a factor that concurs with the large body of literature emphasizing the relevance of intercity relationships in an increasingly globalising world. There is also evidence that the number of cross-border transactions grew as the 1990s progressed and is particularly important for the main economic centres in Germany, and especially for Frankfurt. Third, the results show that factors such as economic agglomeration and the concentration of political power are the main drivers behind the dynamics of M&As. Although many local socio-economic characteristics are associated with the dynamics of M&As when considered individually, their effect seems to be encompassed by the inter-relationship between economic and social factors in large cities, when analysed in conjunction with agglomeration indicators. In contrast, geographical distance – which as an individual variable has a negligible role in the geography of M&As – becomes significant in combination with agglomeration indicators. Even if German firms look for target firms primarily in other German large urban areas, there is a greater chance they would look for them in neighbouring rather than in far away urban regions.

Our analysis has presented a general overview of the geography of M&As in Germany, but, in many ways, it also suggests that further research is needed in order to fully understand the conditions that have driven the recent wave of M&As. Studies by sector and industry are required in order to identify different patterns across industries and, when adequate data become available, some of the questions presented in this paper will have to be revisited in order to analyse the geographical impact of M&As on employment and regional GDP. But perhaps the greatest need is for specific case studies examining in detail M&A transactions within and across urban areas in order to untangle in which way the factors and the dynamics taking place within large urban agglomerations become a magnet for M&As not only in Germany, but also possibly across the globe.

Endnotes

1. Whereas a complete examination of FDI theories and approaches focusing the complexity of M&A lies beyond the scope of this paper, we would like to underline that considerable advances have been made in recent years, particularly with respect to the business and managerial factors behind M&As.
2. From a business and economic perspective, mergers and acquisitions are distinguishable. In fact, the quantity of acquisitions involving the transfer of ultimate control from one company to another is far greater than the recorded total of mergers (Chapman and Edmond, 2000). Spatially, in contrast, mergers and acquisitions are indistinguishable as both represent a process which transfers the corporate locus of control from the acquired firm to the acquiring one and possibly from one urban centre to another (Aliberti and Green, 2000). For the purpose of this paper, therefore, no distinction is made between mergers and acquisitions.
3. Made available by the University of St. Gallen and the *Institute for M&A* of University Witten-Herdecke, and also found in the *Wirtschaftsdatenbank Genios*.
4. German postcodes could not be given to every single merger or acquisition included in the database. 6.5% percent of the transactions were lost as a result. The reasons for this loss range from those attributable to the way data was collected (i.e. errors associated to the manual entering of data in the database by Swiss students of University St. Gallen; the lack of postcode, according to the German postcode directory, for a limited number of locations included in the database; and the recording of same place in different ways in the database as, for example, Neustadt/Aisch vs. Neustadt a. d. Aisch) to external factors (i.e. several German locations have the exact same name and there are small differences between German and Swiss spelling). As most of these problems relate to very small locations and the attribution of postal codes to transactions taking place in urban agglomerations is generally straightforward, this has resulted in a slight overdimensioning of M&A events in urban regions.
5. For greater clarity, the names of the Regierungsbezirke of Darmstadt and Upper-Bavaria have been substituted by that of their two main cities, Frankfurt and Munich respectively. In both cases, the main city constitutes by far the main centre of M&As in the corresponding region.
6. Values for Bremen, Hamburg and Berlin are probably overstated with respect to those of other Regierungsbezirke, as the three city-regions have no hinterlands within their administrative borders.
7. Bremen also scores well in two of the indices, although its results may be affected by the relative low number of M&As that took place in the city in comparison with the other cities included in this group.
8. Education data refer to 1995 and regional R&D investment to 1996, since no previous information was available at the regional level for the whole of post-1990 Germany.

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Annex 1: Regierungsbezirke in Germany



1. Weser-Ems
2. Lüneburg
3. Hanover
4. Braunschweig
5. Magdeburg
6. Dessau
7. Halle
8. Düsseldorf
9. Münster
10. Detmold
11. Amsberg
12. Köln
13. Kassel
14. Giessen
15. Darmstadt
16. Leipzig
17. Chemnitz
18. Dresden
19. Trier
20. Koblenz
21. Rheinhessen-Pfalz
22. Karlsruhe
23. Stuttgart
24. Freiburg
25. Tübingen
26. Unterfranken
27. Oberfranken
28. Mittelfranken
29. Oberpfalz;
30. Schwaben
31. Upper-Bavaria
32. Lower-Bavaria

(Source: www.ifag.de)

Annex 2: Individual regressions for Stuttgart, Hanover, Bremen and Karlsruhe

a.) Stuttgart

Dependent Variable: <i>ln (M&A)</i>					
	Variable	<i>B</i> (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.431***	2.948	0.186	1,38
without <i>samereg</i>	<i>neighreg</i>	0.326**	2.099	0.106	1,37
	<i>ln dist</i>	- 0.321**	- 2.062	0.103	1,37
	<i>ln GDP</i>	0.676***	5.579	0.457	1,37
	<i>ln GDP/cap.</i>	0.292*	1.855	0.085	1,37
	<i>ln POP</i>	0.745***	6.802	0.556	1,37
	% <i>agriculture</i>	- 0.587***	- 4.412	0.345	1,37
	% <i>industry</i>	0.007	0.041	0.000	1,37
	% <i>services</i>	0.254	1.599	0.065	1,37
	<i>education</i>	0.238	1.492	0.057	1,37
	<i>investment in R&D</i>	0.579***	4.320	0.335	1,37
	<i>unemployment</i>	- 0.239	- 1.494	0.057	1,37
	<i>capital city (political power)</i>	0.351**	2.283	0.123	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

b.) Hanover

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.412***	2.791	0.170	1,38
without <i>samereg</i>	<i>neighreg</i>	0.177	1.093	0.031	1,37
	<i>ln dist</i>	- 0.452***	- 3.080	0.204	1,37
	<i>ln GDP</i>	0.406***	2.700	0.165	1,37
	<i>ln GDP/cap.</i>	0.007	0.045	0.000	1,37
	<i>ln POP</i>	0.610***	4.678	0.372	1,37
	% <i>agriculture</i>	- 0.233	- 1.457	0.054	1,37
	% <i>industry</i>	- 0.436***	- 2.950	0.190	1,37
	% <i>services</i>	0.489***	3.410	0.239	1,37
	<i>education</i>	0.375**	2.464	0.141	1,37
	<i>investment in R&D</i>	0.279*	1.765	0.078	1,37
	<i>unemployment</i>	0.268	1.691	0.072	1,37
	<i>capital city (political power)</i>	0.522***	3.723	0.273	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

c.) Bremen

Dependent Variable: <i>ln (M&A)</i>					
	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.558***	4.148	0.312	1,38
without <i>samereg</i>	<i>neighreg</i>	0.437***	2.957	0.191	1,37
	<i>ln dist</i>	- 0.579***	- 4.316	0.335	1,37
	<i>ln GDP</i>	0.201	1.248	0.040	1,37
	<i>ln GDP/cap.</i>	- 0.025	- 0.153	0.001	1,37
	<i>ln POP</i>	0.342**	2.215	0.117	1,37
	% <i>agriculture</i>	- 0.112	- 0.684	0.012	1,37
	% <i>industry</i>	- 0.660***	- 5.340	0.435	1,37
	% <i>services</i>	0.643***	5.105	0.413	1,37
	<i>education</i>	0.252	1.585	0.064	1,37
	<i>investment in R&D</i>	- 0.042	- 0.258	0.002	1,37
	<i>unemployment</i>	0.290*	1.843	0.084	1,37
	<i>capital city (political power)</i>	0.633***	4.976	0.401	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

d.) Karlsruhe

Dependent Variable: *ln (M&A)*

	Variable	β (stand.)	t-statistic	R ²	df
<i>samereg</i> included	<i>samereg</i>	0.408***	2.753	0.166	1,38
without <i>samereg</i>	<i>neighreg</i>	0.406***	2.699	0.165	1,37
	<i>ln dist</i>	- 0.262	- 1.653	0.069	1,37
	<i>ln GDP</i>	0.513	3.634	0.263	1,37
	<i>ln GDP/cap.</i>	0.112	0.683	0.012	1,37
	<i>ln POP</i>	0.672***	5.522	0.452	1,37
	<i>% agriculture</i>	- 0.373**	- 2.442	0.139	1,37
	<i>% industry</i>	0.144	0.886	0.021	1,37
	<i>% services</i>	0.035	0.212	0.001	1,37
	<i>education</i>	0.322**	2.072	0.104	1,37
	<i>investment in R&D</i>	0.523***	3.735	0.274	1,37
	<i>unemployment</i>	- 0.073	- 0.446	0.005	1,37
	<i>capital city (political power)</i>	0.426***	2.865	0.182	1,37

***, **, and * indicate significance at the 1, 5, and 10% level respectively

Annex 3: Results of multiple regression analysis in the remaining four cities

a.) Stuttgart

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.324*** (-3.338)	-0.159 (-1.279)	-0.394*** (-4.025)	-0.357*** (-4.090)	-0.315*** (2.821)
<i>ln POP</i>	0.747*** (7.691)	-	0.663*** (6.624)	0.555*** (5.863)	0.481*** (5.376)
<i>ln GDP</i>		0.635*** (5.114)	-	-	-
<i>capital city (political power)</i>			0.229** (2.173)	0.202** (2.165)	0.079 (0.897)
<i>% agriculture</i>				0.293*** (-3.253)	-0.384*** (-3.963)
<i>Education</i>					0.409*** (2.985)
<i>Investment in R&D</i>					-0.015 (-0.141)
<i>unemployment</i>					-0.178 (-1.234)
<i>Constant</i>	-6.446*** (-3.347)	-5.357** (-2.089)	-4.504** (-2.208)	-2.548 (-1.338)	-3.242* (-1.897)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	35.049	16.647	27.356	28.783	23.847
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.661	0.480	0.701	0.772	0.843
Adj. R ²	0.642	0.452	0.675	0.745	0.808

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

b.) Hanover

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.486*** (-4.647)	-0.511*** (-3.998)	-0.477*** (-5.092)	-0.490*** (-5.182)	-0.545*** (-4.423)
<i>ln POP</i>	0.636*** (6.079)	-	0.511*** (5.029)	0.552*** (5.035)	0.499*** (4.163)
<i>ln GDP</i>		0.470*** (3.678)	-	-	-
<i>Capital city (political power)</i>			0.320*** (3.153)	0.323*** (3.181)	0.276** (2.370)
<i>% agriculture</i>				0.103 (0.999)	0.093 (0.737)
<i>Education</i>					0.211 (1.114)
<i>Investment in R&D</i>					0.036 (0.266)
<i>unemployment</i>					-0.136 (-0.705)
<i>Constant</i>	-2.828 (-1.371)	0.936 (0.413)	-1.202 (-0.627)	-1.904 (-0.933)	-1.170 (-0.446)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	27.826	13.114	26.473	20.103	11.715
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.607	0.421	0.694	0.703	0.726
Adj. R ²	0.585	0.389	0.668	0.668	0.664

Notes: t-statistics in parentheses
***, **, and * indicate significance at the 1, 5, and 10% level respectively

c.) Bremen

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.545*** (-4.230)	-0.569*** (-4.276)	-0.567*** (-6.285)	-0.566*** (-6.192)	-0.590*** (-5.136)
<i>ln POP</i>	0.277** (2.145)	-	-0.017 (-0.164)	-0.009 (-0.077)	-0.026 (-0.197)
<i>ln GDP</i>		0.170 (1.275)	-	-	-
<i>capital city (political power)</i>			0.628*** (6.222)	0.627*** (6.107)	0.629*** (5.146)
<i>% agriculture</i>				0.015 (0.140)	0.004 (0.029)
<i>Education</i>					0.095 (0.480)
<i>investment in R&D</i>					-0.049 (-0.334)
<i>Unemployment</i>					-0.112 (-0.632)
<i>Constant</i>	2.093 (0.952)	4.063** (2.026)	5.786*** (3.511)	5.659*** (2.975)	6.031** (2.607)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	12.521	10.284	29.999	21.874	11.609
Significance (F)	0.000	0.000	0.000	0.000	0.000
R ²	0.410	0.364	0.720	0.720	0.724
Adj. R ²	0.377	0.328	0.696	0.687	0.662

Notes: t-statistics in parentheses
 ***, **, and * indicate significance at the 1, 5, and 10% level respectively

d.) Karlsruhe

Dependent Variable: <i>ln (M&A)</i>					
	(1)	(2)	(3)	(4)	(5)
<i>ln dist</i>	-0.229* (-1.949)	-0.109 (-0.730)	-0.269** (-2.321)	-0.258** (2.154)	-0.348** (-2.246)
<i>ln POP</i>	0.661*** (5.622)	-	0.562*** (4.478)	0.543*** (4.045)	0.520*** (3.774)
<i>ln GDP</i>		0.478*** (3.188)	-	-	-
<i>Capital city (political power)</i>			0.235* (1.851)	0.228* (1.767)	0.078 (0.582)
<i>% agriculture</i>				-0.058 (-0.451)	-0.112 (-0.787)
<i>Education</i>					0.277 (1.355)
<i>investment in R&D</i>					0.074 (0.463)
<i>Unemployment</i>					0.067 (0.326)
<i>Constant</i>	-4.889** (-2.344)	-2.814 (-1.012)	-3.293 (1.500)	-3.024 (-1.316)	-3.291 (-1.507)
Observations	39	39	39	39	39
Degrees of freedom	2, 36	2, 36	3, 35	4, 34	7, 31
F-value	18.301	6.784	14.166	10.433	7.831
Significance (F)	0.000	0.003	0.000	0.000	0.000
R ²	0.504	0.274	0.548	0.551	0.639
Adj. R ²	0.477	0.233	0.510	0.498	0.557

Notes: t-statistics in parentheses
 ***, **, and * indicate significance at the 1, 5, and 10% level respectively