

# **The Position of the Zuidvleugel within Worldwide Economic Networks**

Dr. Ir. Ronald Wall

**WALL RESEARCH**

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# The Position of the Zuidvleugel in Worldwide Economic Networks

## Introduction to world city networks and their importance to urban development:

The urban planning tradition of locally based, blue-print planning is today being increasingly destabilized by the irreversible processes of globalization (Graham and Marvin 2002). In this way, planning, which is still 'centered in old traditions of permanence,' is being 'irrevocably destabilized in cities marked by economic networks, massive infrastructures, and growing estrangement' (Sassen 2003). Hence, Tafuri's prediction (1973) that spatial planning professions would someday be swamped by capitalism has become a harsh reality! The impact of exogenous forces on cities is clearly epitomized by the current financial crisis, revealing the precarious interdependence of global economics and urban development. For instance, Dubai's recent crash relates to the fact that it is the most globally integrated of the Gulf cities, and hereby vulnerable to world economic instability (Wall 2010). In this light, an uneasy uncertainty has settled upon the urban planning professions, as they have lost their previously established ability (and credibility), to control the forces which now impact upon cities. Therefore, if planners still aim to effectively and qualitatively improve urban environments, it is important that the profession evolves - where planners cease to be 'helpless puppets of the institutions they inhabit' (Harvey 2006), and avoid the vested interests of those trumpeting that no alternative exists to our current world. This requires that these spatial disciplines start to confront the 'massiveness of the urban experience', and go 'beyond notions of high-tech architecture, virtual spaces, simulacra, theme parks, and materialities of power' (Sassen 2003). Planners and architects should embrace the paradox of the globally connected, but locally disconnected urban landscape, and hereby develop cities as integral components of a world city network (Amin and Graham 1999). Furthermore, because cities are increasingly unpredictable, blue-print type planning should be avoided (Neuman 1998), and instead a new planning must be developed that intervenes at strategic points and scales of the urban system (Portugali 2000) - points at the intersection of social, economic or physical networks. It concerns interventions at the border between complexity and order, where urban planners mediate between global forces of economic production and the local ideals of the production of space (Lefebvre 2003). This requires a reflexive, adaptive planning, which is hyper-aware of its multi-scalar context, and which can effectively accommodate rapid changes in the world economy! In this context, urban planning should not simply be the product of economic demand, but should form an important determinant and regulator of economic flows within and between cities.

Over the past decades, there is increasing interest in the economic networks between cities, in which it is argued that the rise of the *network economy* is the result of advances in ongoing globalization, transport and communication technology, common markets, the individualization of production and the growth of multinational firms. It is said that these aspects significantly impact on the spatio-economic structure of cities and regions (e.g. Batten, 1995, Anas et al., 1998), in which the monocentric city is transforming into a polycentric urban network. However, paradoxically academics and policymakers persistently focus on sub-national regions as the essential unit of economic activity. In general, most studies and policies fail to conceptualize regional development in an era of globalization (Dicken and Malmberg 2001). Instead, it is arguable that a combined strategy of global production networks and regional assets should be pursued, in which activities are understood across different geographical scales (Coe et al., 2004, Dicken et al., 2001). However, today, only a limited number of world city network studies exist (due to scarcity of available network data) - e.g. international banking (Meyer 1986), producer service firms (Taylor, 2004), MNC governance (Alderson and Beckfield, 2004), and corporate directorates (Carroll, 2007).

Because economic processes take place at larger spatial scales than that of the traditional city (Kloosterman and Musterd, 2001, Van Oort et al., 2008), local administrative boundaries have become increasingly inadequate (Friedmann, 1986). This is because today, urban competition is primarily determined by what flows between cities, rather than what is fixed within them (Castells, 1996). Therefore, a city's competitiveness should be seen as a function of its network - in which urban development cannot be understood without addressing the networks to which cities belong (Rozenblat and Pumain, 2006). Interest in competitiveness has led to many ranking lists, in which cities are compared to each other e.g. economic performance (Kresl and Singh, 1999), multinational presence (Godfrey and Zhou, 1999) creativity (Florida, 2005), accessibility and services (Kaufman et al., 2005), or sustainability (Dutzik et al., 2003). These studies assume that all cities are in competition with each other, and do not measure competition as a relationship between cities. In this light, most national planning policies (e.g., 'Randstad 2040' (2006) still simply consider the spatial proximity of cities as critical to their economic performance, ignoring the coexistence of transnational networks (Van Oort et al., 2006, Taylor et al., 2008). This is odd, considering the many studies (e.g., Camagni and Salome, 1993, Davies, 1998) that stress the need for an 'intellectual transition' in the conceptualization of urban external relations (Meijer's, 2007). Therefore, in order to validate urban competitiveness, it is important to understand the extent to which cities compete with each other and where this competition comes from (Markusen and Schrock, 2006). In this light, the central argument of this report is that to effectively develop the Zuidvleugel in today's globalizing world, we need to empirically understand the relationship between its local significance (as a place) and its global significance (as a network).

Studies on global city networks are not entirely new. Gereffi et al. (1994) defined global commodity chains as interorganizational networks of products that link enterprises and states to each other within the world economy. Earlier, within a more city-related context, Friedmann and Wolff (1982) developed a conceptualization of world cities as 'command centers', regulating the 'new international division of labor.' These approaches have led to various theoretical studies on cities and globalization (e.g., Sassen, 1991, Castells, 1996, Godfrey and Zhou, 1999), but the number of empirical world city network studies remains limited due to scarcity of 'relational' data (Taylor, Walker and Catalano, 2002). To date, only a handful of relational studies exist, e.g., on international banks (Meyer 1986), advanced producer firms (Taylor 2004), MNC governance (Alderson and Beckfield, 2004), and corporate directorates (Carroll, 2007). Therefore, the results of this network study for the Zuidvleugel forms a unique contribution to understanding cities.

### **The two research questions investigated in this study:**

This report is based on previous studies that I have carried out, and new research done exclusively for the Provincie Zuid-Holland. Two types of data are used - i.e. 'corporate ownership' data and 'foreign direct investment' (FDI) data. The data and methodology will be discussed in more detail further on. Based on the arguments made in the introduction, two central research questions have been formulated. *First, which cities does the Zuidvleugel collaborate with in terms of economic interactions?* In this it is of interest to understand which firms are situated in the Zuidvleugel and what their economic relations are with firms in other cities, at the local, regional and global spatial scale. In this way a relative understanding of the Zuidvleugel is made. It is argued that this is important for the Zuidvleugel's development, because a region needs to know what its economic identity and significance is within the global economic system. This concerns revealing the region's industrial strengths, its hierarchy or rank amongst other cities, and the strengths of its relations to firms in other cities. In a way, it is similar to a natural ecosystem, in which different animal and plant species exist at different geographic locations, hold different functional purposes and characteristics, and ultimately interact with other species in order to survive.

*Second, it is questioned which other cities are the true competitors of the Zuidvleugel, in terms of economic network relations.* In the context of this study, competition is defined as other cities that have very similar network characteristics as the Zuidvleugel. Two cities are competitors if) they are economically connected to the same other cities worldwide, and that they both have the same type of industries. This explained later on. Essential to answering these two questions is to verify if economic relationships to distant cities are far more important to the Zuidvleugel's development than relationships at the local level.

The following chapter concerns a historical introduction to world city networks, and the interdependence between economic networks and city development. This is followed by a short chapter on the data and methodology used. In the chapter after that, the meaning of the Zuidvleugel within corporate ownership data is explored, followed by a similar analysis using mergers and acquisitions data. Finally, in the last chapter the conclusions and recommendations for the Zuidvleugel are discussed.

### **An examination of city networks over the past centuries and the significance of these networks to city development.**

In the book *The Human Web*, J.R and W.H. McNeill (2003) explain that human history essentially concerns the expansion of social networks across the globe. This, it is said, relates to the increased scale of economic interaction, infrastructural development, technological innovation, and declining transport costs (Bordo, Taylor and Williamson, 2005) - in which new patterns of demand, output, and employment have been created (Maddison, 1995). Another important factor is the development of the nation-state, inaugurated by the Westphalia Treaties in 1648 (Kentor, 2005). However, although the importance of nation states grew over the past centuries, in the last few decades of the 20<sup>th</sup> century, this system has started to fracture - primarily due to the growing importance of multinationals (Taylor, 2004) - because these firms have dispersed production and labor across the globe (Sassen, 1991). Multinationals have become the foundation of a new dimension of economic power, enabling them to increasingly circumvent regulations formally controlled by the nation-state (Kentor, 2005). Through this process, multinationals and their subsidiaries are now situated in thousands of cities across the globe, leading to an extremely complex intercity corporate network. The hierarchy of these networks is determined by the relative power of the corporations residing within these cities, expressed in terms of their control over the economic activity in other cities (Ross, 1994). Related to the arguments above, the four maps (Figure 1) illustrate how economic networks have developed since the start of the Industrial Revolution. This transition is based on four succeeding phases of technological innovation, namely: (1) *steam power, mechanization, and railways*, (2) *electricity, steel, and heavy engineering*, (3) *oil, motorization, and mass production*, and finally, (4) *information and communication technologies*. Each period is illustrated with geographic information system (GIS) maps that represent specific phases of network formation, based on various data (Chandler, 1987, van Susteren, 2007). It is argued that the contemporary global network is the result of an evolutionary process, in which intercity linkages not only diversified and strengthened over time, but more efficient technologies have led to faster and higher volumes of exchange between cities. Furthermore, core, semi-periphery, and periphery relationships have developed over time into an increasingly complex structure. In these maps, the primary cities of the core (London in the first two maps and New York in the second two maps), have increasingly served as locations of leading technologies and central markets, revealing the diversity and intensity of connections that they have with semi-peripheral and peripheral cities. From this, increased transnational interaction has led to the spread of regional and local sub-centers, consisting of networks of smaller types of firms.

In the 17<sup>th</sup> century, the previously city-centered economies became organized into state-centered ones (through the Westphalia Treaties), in which city interactions flourished more than ever before (Bairoch, 1989). This led to the rapid emergence of large cities and an unprecedented rise of demand and trade. In this era, the Dutch excelled at international trade, hereby shifting the locus from Venice and Genoa to Amsterdam (Findlay and O'Rourke, 2007). Because Amsterdam was strongly linked to colonial settlements, the Dutch economy can be regarded as 'the first modern economy' (Vries de, v.d. Woude, 1997). The Dutch East India Company, headquartered in Amsterdam, was the first multinational corporation in the world, making Amsterdam the primary world center for trade and finance (Ames 2008). As is demonstrated in these maps, the rapid development of cities since the start of the Industrial Revolution is strongly related to the development of economic networks between these cities. In this way, the fate of cities has become increasingly tied to their relative position in international flows of corporate investment (Alderson and Beckfield 2004). Therefore, to understand the competitive nature of cities we need to know the relationship between what flows through them and what is fixed within them (Taylor 2004). In this light, making a tentative elaboration of Sullivan's original phrase 'form follows function', it means that effective urban planning in a globalizing world will depend on understanding how 'form follows function follows flows'. To explain this idea, a hypothetical diagram is used (Figure 2).

In the diagram four cities, A, B, C and D are found. Between these cities investments take place from one city to another. For instance, City-A has 200 corporate investments into City-B. The firms in City-B which are making the investments are usually headquarters, who invest in the firms in city-B, the so called subsidiaries. Similarly, the headquarters in City-B have 50 investments into subsidiaries in City-A. Other investments also take place with City-C and City-D. The arrows indicate the direction of the investment – in other words, which firms in a particular city are investing in firms in another city. Looking at City-A, we see that it holds a total of 570 investments into and out of it. Similarly, City-D has 450, City-B 250, and City-C 170 total investments. The magnitude of these investments determines the size of the city (grey dots). So far we have only discussed network data. Besides this data, other types of data can be collected on the urban performance of these individual cities, such as city GDP, education levels, urban attractiveness, degree of innovation, infrastructure levels, or creativity. These indicators measure different dimensions of a city's development. What my research shows is that there is a high correlation between a city's development level (its meaning as a place) and its total intercity corporate investments (its significance within the network). This is shown in the correlation table (Table 1). The data is explained in detail further on. On the one hand, it concerns 9243 investments between thousands of cities worldwide, which in turn determines city ranks - in which for instance New York, London, Paris and Tokyo are ranked at the top. On the other hand, the data concerns development indicators collected from various sources, such as the World Bank and UNDP. These two types of data are statistically compared to each other, in which a correlation coefficient around 0.6 indicates a strong relationship, and a score of 0.8 and above - a very strong relationship. As seen, all scores are good. Although this does not explain the causality between the indicators, it does indicate the coherence between development and a city's network strength. In other words, a city's development levels at the local level are strongly related to its strength within the global corporate system. Taking this further, the following table (Table 2) shows the results of a regression analysis. Here softer variables have been included, such as the 'quality of a city's institutions' and its 'openness to trade with other cities' (indicated with stars). Both these variables (and others) show strong significance. In the provided graph (Figure 3), the changing rank of cities over time is explored. More specifically, only cities found in the Gulf (Middle East) and their investments to cities worldwide have been explored. Evident, is the changing position (rank) of these cities over the period of 2005 to 2009. It is clear that these cities boomed between 2005 and 2006, with a sharp decline towards 2010 (recession), and ultimately the bankruptcy of Dubai in 2010. The importance in showing these results is to confirm that indeed, an understanding of the Zuidvleugel's position with global economic networks is essential to understanding its general development.

## Data and methodology:

The data used in the analyses concern multinational networks, which are important to the global economy. For instance, the top 200 global corporations (1999) accounted for approximately 30% of world GDP (Anderson and Cavanaugh, 2000), and the top 500 multinationals (2004) accounted for 90% of world FDI and 50% of global trade (Rugman, 2005). Much of this activity consists of transnational transactions which are typically controlled by corporate headquarters that determine the magnitude of foreign investment, the transfer of technology, access to international markets, the repatriation of profits, the number of employees, etc. Similarly, the data used in this research concerns ownership relations (51% or more share) between headquarters to subsidiary firms worldwide (Wall, 2009a). Although multinationals have global reach, they differ by economic size and geographic location, which subsequently determines the total number of corporate connections and strengths of the ties between cities. Furthermore, firms connect networks together at local, supra-regional and global scales. For the analyses, two types of data have been used. The first type of data is from previous studies and concerns 'corporate ownership', which means a 51% or more share of one firm into another. The second type of data, collected specifically for this assignment, concerns 'mergers and acquisitions' (M&As) between firms.

Concerning the first type of data, the ownership data, three comparative datasets (global, European and Dutch) have been collected, based on *Fortune*, *Lexis-Nexus* and *Reach* sources (2005). Each dataset includes the top 100 headquarters located either in the world, Europe or the Netherlands. It is important to note that the difference between the three datasets lies in the varying economic sizes, and the geographic locations of their initial top 100 headquarters. However, the subsidiaries for all three networks are worldwide. For instance, the top 100 global headquarters are economically stronger than those of other scales, and are located in cities across the globe. In the case of the top 100 Dutch headquarters, these are less financially powerful and are located only in Dutch cities. However, in both these cases, the headquarter networks to subsidiaries, span the globe. The *global* ownership network holds 9,243 corporate ties, connecting 2,259 unique cities worldwide. The *European* ownership dataset holds 8,307 ties to 2,369 different cities across the globe, while the *Dutch* ownership dataset holds 9,012 connections to cities worldwide. In this way, the data is unique because cities are not preselected (as is usually the case), but instead includes all cities that exhibit headquarters or subsidiary ties. Nonetheless, this data has two limitations. Firstly, the data only reveals that there is an ownership linkage between firms, but unfortunately does not provide the financial value of these linkages. However, recent research shows that there is a high correlation between the number of linkages that a city has and the total value of these linkages. Therefore, it is safe to say that the results stemming from this the ownership gives a reliable indication of what the valued network would be. The other limitation is that the ownership data is limited to only one year (2005), therefore only allowing for a cross-sectional analysis of that year.

The second type of data used, is based on the *Zephyr* database (2000 – 2009), and concerns M&As between European firms and other firms of the world. Unlike the ownership data, this data covers a period of nine years and the true value of the investments are known. M&As represent investments of one firm into another, - with the incentive of gaining a degree of control over that firm's operations. Because M&As are said to represent 78% of global investments (Brakman et al. 2006), it serves as a good indicator of FDI. These investments are fundamental to urban development, and are controlled by a relatively limited number of firms. In fact, only the top 500 multinationals in 2004, accounted for 90% of global FDI (Rugman 2005), effectively boosting urban development and accelerating the speculative construction of space. Furthermore, the fact that after the mid-1980s, FDI grew much faster than trade, and today claims a huge share of global GDP - shows that it has become the primary mechanism of today's global economy, and impacts strongly on the process of urbanization. In fact, as a whole, today's share of urban infrastructure in total FDI stocks globally, is approximately 10%, compared to only 2% in

1990 (World Investment report 2008). The penetration of foreign capital through inter-urban competition is said to generate urban growth faster than previous forms of industrialization (Harvey 1989). In this sense, it has led to today's "entrepreneurial city" (Jessop et al. 2000), in which the city is not only structure, but also agent, generating urban growth by pursuing place-based dynamic competitive advantages to capture mobile capital and fix this in place (Cox and Mair 1991). In its absorption of FDI, the entrepreneurial city introduces new types of urban space for producing, serving, working, consuming, etc. - like technopoles, intelligent cities and cross-border cities. It also introduces new methods of space or place production to create location-specific advantages for producing goods and services or other urban activities, like the installation of new physical, social and cybernetic infrastructures. Based on these arguments, M&A data serves as an important type of network data to explore - in which the development of cities in general and the Zuidvleugel in particular, can be studied. One limitation of this data is that it does not include M&As of Switzerland and Norway.

Based on the two types of data, the corporate *centrality* (rank position) and *structure* (linkage structure) of cities has been determined. *Centrality* is a statistical measure of the total corporate ties that a city has with other cities. This can be measured in two ways. *Outdegree* is a measure of a city's headquarters ties to subsidiaries in other cities and represents a city's economic power over other cities (Alderson and Beckfield, 2004). *Indegree* is a measure of a city's subsidiary linkages to headquarters in other cities. It is a measure of how dependent other cities are on a particular city. *Structure* is a measure of the strength of individual linkages between cities. In this way, network measures can define a city's relational positional within the global system. For those interested, an elaborate description of these techniques can be found in the book Netscape (Wall 2009a). Using these techniques, the two different types of economic network data are explored to determine a relative understanding of the Zuidvleugel. The first part concerns results related to the corporate ownership data. In the next part, results concerning the M&A data will be discussed.

## **PART 1: Exploring the Zuidvleugel within Corporate Ownership Networks:**

### **G4 cities within global, European and Dutch corporate networks:**

#### *G4 cities within the global corporate network:*

In the provided map (Figure 4), the network of corporate ownership between 2,259 unique cities is shown. The network has been visualized by means of geographic information systems (GIS) software, and represents approximately 50% of the global GDP of all OECD countries in 2005. It has been found that 82% of these ownership ties take place 'between' cities that are distant from each other, while only 19% takes place 'within' their municipal boundaries (Wall 2009a). This confirms that nowadays, cities obtain significance by what flows between them, rather than what is fixed within them. Similarly, it has been found that only 17% of the observed cities carry headquarter connections - in which New York, Paris, Tokyo and London together claim 25% of the total. It is therefore not surprising that these well developed, powerful cities hold the world's largest financial stock markets. On the other hand, it has been revealed that subsidiary firm connections are dispersed over all 2,259 cities (Wall 2009), revealing the immense global control of multinationals. Furthermore, the map shows that the spatial distribution of today's multinational network is clearly uneven, polarized into three core regions, namely North America, Europe and Asia Pacific. Africa in particular, is marginalized from the world economy, claiming a mere 1% of all corporate investments. As can be seen, Dutch cities are well situated within the intense corporate connectivity of the European region.

In the list (Table 3) the centrality scores of the global top 100 headquarter networks is shown, in which New York is 1<sup>st</sup> both in terms of headquarter (outdegree) and subsidiary (indegree). Düsseldorf is 2<sup>nd</sup>, Munich 3<sup>rd</sup> and Zurich 4<sup>th</sup>, proving to be top global cities, where London at 6<sup>th</sup> position, Paris 7<sup>th</sup> and Tokyo 22<sup>nd</sup> are weaker than expected. The global centrality strengths of moderately populated cities like Düsseldorf, Munich and Zurich, confirm Powell's (1990) conception of network organization, that modestly populated cities can specialize in services, and hereby elevate their status in the urban hierarchy. Concerning the Randstad (G4) cities, it is seen that, in terms of outdegree, Amsterdam claims 9<sup>th</sup> position and The Hague 11<sup>th</sup> position in the global economy. However, The Hague's position is mainly related to Shell's presence in this city. Furthermore, it is observed that Rotterdam and Utrecht do not have headquarter functions within the global network. However, considering subsidiary relationships, Rotterdam ranks 21<sup>st</sup> and Utrecht 31<sup>st</sup>. In terms of subsidiaries, Furthermore, Amsterdam claims a disproportionately high share of the G4's connections (Wall, 2009b). Hence, the global position of the Randstad is highly dependent on the corporate activities of Amsterdam. Regarding the linkage strengths seen in the table (Table 4), Amsterdam has strong outdegree relations with subsidiaries in Paris, Brussels and Hong Kong, while, alternatively, Amsterdam has strong indegree relations with headquarters situated in Brussels, Paris, Dusseldorf and London. See also the global network diagram (Figure 5).

#### *G4 cities within the European corporate network:*

The second dataset concerns worldwide networks generated by top European 100 multinationals (Wall, 2009b). It is evident in the list (Table 5) that Paris and London have risen, relative to the ranking in the global network, to 1<sup>st</sup> and 2<sup>nd</sup> position, in both headquarter and subsidiary functions, followed by Zurich. The most important non-European subsidiary cities are Singapore 6<sup>th</sup>, Hong Kong 8<sup>th</sup> and Buenos Aires 10<sup>th</sup>. Looking at ranks of Randstad cities, a higher ranking is evident than at the global scale. Amsterdam now ranks 4<sup>th</sup> as a headquarter city, meaning that it plays a stronger role in the European network than the global one. Furthermore, Utrecht ranks 30<sup>th</sup> and Rotterdam 38<sup>th</sup>, while The Hague's headquarter status has become relatively less important, arguably because its petroleum operations (Shell) are less important to the Europe than to the world. In this dataset, Amsterdam, for instance, has strongest outdegree relations with London, Zurich and Tokyo (Table 4) and is alternatively highly controlled by headquarters in Paris and Vevey. See also the Europe network diagram (Figure 6).

#### *G4 cities within the Dutch corporate network:*

The next scale concerns The Netherlands top 100 corporate network (Wall, 2009b), in which it is evident that in terms of outdegree, Amsterdam ranks 1<sup>st</sup>, Utrecht 2<sup>nd</sup>, Rotterdam 3<sup>rd</sup> and The Hague 4<sup>th</sup> (Table 6). In terms of indegree, Dutch subsidiaries are more important to international cities like London 2<sup>nd</sup>, and Paris 3<sup>rd</sup>, than to other Dutch cities. This shows that the main corporate relations of the Randstad are related to cities outside The Netherlands. Amsterdam's strongest linkages are to Paris and London (Table 4). Looking at which cities are most connected to the Randstad top four (Table 7), it is clear that Amsterdam's strongest outdegree linkages are to subsidiaries within Amsterdam, then Paris. Rotterdam, which is primarily connected to London and Walton on Thames, is therefore more related to the UK than to The Netherlands. Utrecht is mostly oriented towards Amsterdam, but also strongly connects to Luxembourg and Brussels. It is also highly connected to Willemstad (Dutch Antilles). The Hague is firstly linked to Wilmington, due to Wilmington's importance in petroleum insurance. Looking at the internal relations between Dutch cities (Figure 7), it is evident that Amsterdam and Utrecht are strongly connected forming a powerful region, while Rotterdam and The Hague have moderate ties to each other. Cities in the Noordvleugel are therefore not strongly connected to cities in the Zuidvleugel, verifying that Randstad cities are weakly connected to each other (Van Oort et al., 2006).

*A detailed analysis on Dutch city relations within The Netherlands and internationally:*

In the previous three scales of top 100 networks, only Amsterdam, Utrecht, The Hague and Rotterdam play a significant role. In the next part, a more elaborate dataset has been developed to obtain deeper insight into the corporate interdependencies of Dutch cities and see whether other Dutch cities also play an important role. This data concerns the top 10 000 corporate headquarters of firms located in The Netherlands, (Reach database 2007) and their 111 883 corporate connections to subsidiary firms in and beyond The Netherlands. The data specifies city to city relations within The Netherlands, but unfortunately does not specify international cities, but only countries to which Dutch cities are connected. The firms are also specified by industrial codes, by which specific sub-analyses could be carried out. The first analysis revealed that 42159 (38%) of the corporate connections are found within The Netherlands, while 69724 (62%) connections are international. This clearly shows that the Dutch economy is primarily globally oriented, and in terms of connectivity per capita, is the most corporately connected country in the world.

In the ranking list (Table 8), the corporate strengths of Dutch cities are revealed. The first column shows their international importance, where it is clear that Amsterdam (1<sup>st</sup>) is by far the most internationally connected city. It is roughly three times stronger than Rotterdam (2<sup>nd</sup>), Utrecht (3<sup>rd</sup>) and The Hague (4<sup>th</sup>). Furthermore, it claims 31% of all Dutch international connectivity. The combined G4 cities hold 60% of all Dutch international connectivity. If we look at the connectivity of the Noordvleugel and Zuidvleugel, it is found that the former claims 43% of international linkages, while the latter claims 24%. It is clear that the Noordvleugel is approximately twice as globally oriented as the Zuidvleugel. In the table, the boxed cells represent cities of the Noordvleugel, while the grey cells represent Zuidvleugel cities. This is useful to compare the relative strengths of these cities to each other, and to other cities of The Netherlands. The remaining Noordvleugel cities (without Amsterdam) together only claim 12% of international connectivity. Hilversum (17<sup>th</sup>), Alkmaar (24<sup>th</sup>) and Almere (30<sup>th</sup>) hold very modest international connectivity levels. It is interesting that new town Almere claims higher connectivity than the more established cities of Haarlem and Amersfoort. In the network diagram (Figure 8), the corporate connectivity between Dutch cities and different nations is seen. Note, only linkages greater or equal to 30 are shown, hereby representing the most important network. It is evident that Amsterdam has the strongest linkages (thickness), but also the highest diversity of nations to which it connects. This shows that Amsterdam is the most globally 'integrated' Dutch city. Its strongest linkages are to the U.S., the U.K., Germany and Spain. Rotterdam is strongly linked to the U.K., Italy and Germany and the U.S. - but has less diversity of international connections. Similar to Amsterdam, Utrecht is well linked to the U.K., Belgium, France and Germany - while The Hague, similar to Rotterdam, is connected to the U.K., Italy, Germany and the U.S. It is notable that Amsterdam and Utrecht have the same linkage preferences, as do Rotterdam and The Hague. Other Noordvleugel cities like Almere, Hilversum and Alkmaar play a more moderate role in the network. It is also evident that the U.K., the U.S., Germany and France are pivotal to the Dutch economy.

*The national centrality and structure of Dutch cities:*

Looking at only those connections which take place within The Netherlands (Table 8), we see that Rotterdam heads the list (second column), holding 12% of all national connections. It is one and a half times stronger than Amsterdam (2<sup>nd</sup>) at this level. The combined G4 cities claim 33% of national connectivity. Utrecht (3<sup>rd</sup>) and The Hague (4<sup>th</sup>) maintain the same rank as they do internationally. Interestingly, there is lot of variance between the international and national lists, where cities below the G4 have little overlap. For instance, Amersfoort (40<sup>th</sup>), is much stronger nationally (18<sup>th</sup>), while Almere (30<sup>th</sup> and 33<sup>rd</sup>) maintains a similar strength within both networks. Or that Westland (23<sup>rd</sup>) is only significant within the national network. This clearly shows that cities play different

roles within the economic system. The combined cities of the Noordvleugel hold 20% of the national network, which is half of that of the international network. Hence, the Noordvleugel is primarily internationally oriented. The Zuidvleugel cities together hold almost 30% of national connections, which is higher than their international share. In this light, the Zuidvleugel is more nationally oriented. If we look at the linkages strengths (Figure 9) between Dutch cities, it is firstly evident that Rotterdam has the highest diversity of unique connections. Therefore, Rotterdam is the most nationally integrated city, with strong connections to Utrecht, Amsterdam and Rijssen. Amsterdam is evidently less integrated within The Netherlands. Its strongest connection is to Utrecht, followed by The Hague and then Rotterdam. Utrecht is well connected to Amsterdam and Rotterdam, but it is striking that no significant connection is found between Utrecht and The Hague. The Hague is well connected to Amsterdam, followed by Rotterdam. A small regional sub-network is seen between Haarlemmermeer, Hoofddorp and Schiphol. Amersfoort and Hilversum have strong connections with Rotterdam, while Almere has moderate ties to Amsterdam. The arrow direction shows that headquarters in big cities hold shares in subsidiaries in smaller cities. It is also seen that many of the cities that Rotterdam and Amsterdam are connected to, are within their own immediate region, revealing the importance of regional proximity. Hence, smaller cities tend to service their own immediate core cities. However, the strengths of these connections are far less than at national and international levels. Again, this underlines that cities play different roles within the economic system, and should be developed accordingly.

#### *Sectoral differences of corporate network between Dutch cities:*

In this analysis the national network is separated into various levels of industrial sector (Table 8). At the highest level, the network is split into goods and information related firms (column 3 and 4). As expected, Rotterdam holds the majority of goods connections, which is almost three times stronger than Amsterdam. Utrecht holds 5<sup>th</sup> position in goods, succeeded by Nieuwegein (3<sup>rd</sup>) and Rijssen (4<sup>th</sup>). Hilversum (21<sup>st</sup>) Amersfoort (42<sup>nd</sup>) and Almere (86<sup>th</sup>) play a weaker role in goods than in information industries. Amsterdam tops the list of information industries, followed by Utrecht, Rotterdam and The Hague. The differences between the G4 cities are far less than in the goods sectors, indicating that information firms are more evenly spread in the Randstad. Hilversum (10<sup>th</sup>), Amersfoort (15<sup>th</sup>) and Almere (23<sup>rd</sup>) are clearly stronger in information than in good related activities. In the next part, we look at several important sub-sectors of the network (Table 8). Important with these is that the network is split into headquarters and subsidiaries, indicated as (H) and (S) in the columns. Column five shows the business services headquarter relations, in which Rotterdam heads the list (1<sup>st</sup>), followed by Almelo (2<sup>nd</sup>), Gouda (3<sup>rd</sup>), Amsterdam (4<sup>th</sup>) and Utrecht (5<sup>th</sup>). In column six we see the business service subsidiary networks. Rotterdam, Amsterdam and Utrecht top the list.

In the headquarter relations of the insurance sector, Utrecht (1<sup>st</sup>) and Amsterdam (2<sup>nd</sup>) top the list, followed by Zeist (3<sup>rd</sup>), Rotterdam (4<sup>th</sup>) and The Hague (5<sup>th</sup>). The Hague evidently is strongest in insurance subsidiaries (column eight), followed by Amsterdam, Utrecht, Capelle a.d. IJssel and Rotterdam. In terms of real estate headquarters, column nine shows Rotterdam (1<sup>st</sup>), Heerlen (2<sup>nd</sup>), Amsterdam (3<sup>rd</sup>), The Hague (4<sup>th</sup>) and Naarden (5<sup>th</sup>). This sector also proves to be Hilversum's (6<sup>th</sup> and 7<sup>th</sup>) strongest sector. Interestingly, Utrecht only ranks 19<sup>th</sup> in this sector's headquarter relations - however, in terms of real estate subsidiaries (column ten), Utrecht is 5<sup>th</sup>. In the last two columns wholesale trade networks are revealed. Utrecht, Rotterdam and Amsterdam top both these lists, but The Hague plays a weak role in wholesale trade. From this study it is evident that the centralities and structures of cities are also dependent on the specific industrial sectors observed.

## **Explanations on the relationship between corporate network centrality and performance indicators of various cities in The Netherlands:**

### *Economic, social and spatial environments versus connectivity, at the Dutch corporate scale:*

In general, it can be argued that cities that have a better business climate also attract more corporate establishments. From a functional point of view, cities are composed of various place characteristics that shape the business climate (Marlet and Woerkens 2003). In this research, a distinction is made between three broad categories: the *economic environment*, the *socio-economic environment*, and the *spatial environment*. The economic environment of cities is linked to the production structure and economic activities present in a city. The social-economic environment is linked to the labor market and employment climate in a city. Finally, the spatial environment is linked to physical attractiveness of a location, in terms of accessibility and amenities. It should be noted that the causality between the business climate of cities and urban network connectivity remains unclear. On the one hand, a city with a good economic, socio-economic and spatial environment, is more likely to draw firms and workers, which in turn would improve urban network connectivity. On the other hand, being well connected within the urban network is an asset in itself and can boost business climate and urban performance. In other words, business climate can be regarded as both a cause and consequence of urban network connectivity.

### *The economic environment of cities*

The focus here is on three dimensions of the economic environment of cities: *economic density*, *entrepreneurial activity*, and *specialization in producer services*. Concerning *economic density*, it is arguable that densely clustered economic localities are likely to accommodate knowledge-generating institutions (e.g., universities, R&D laboratories, trade associations). Moreover, the presence of a large internal market offers a larger degree of stability and lowers transaction costs of firms. *Economic density* is expressed here as the number of establishment (CBS). *Entrepreneurial activity* is expectedly related to connectivity. Cities with a high proportion of entrepreneurs are considered places of variety. Jacobs (1969) argued that the variety present in a city augments its economic growth. Next, cities specialized in *producer services* tend to be better connected to the urban network (Taylor, 2004). Not only are producer services the largest and fastest growing sector of the Netherlands, but is the sector in which network formation is strongest. In the results, (Figure 10) it is seen that a moderately positive relationship exists between *economic density* and city network connectivity. Cities like Amsterdam, Rotterdam, The Hague, Apeldoorn, Amersfoort and Alkmaar, fit the model well, meaning that the number of establishment is quite proportionate to the connectivity of these cities. What this model tells us is that when a city increases its number of business establishments by 1%, the corporate network connectivity to other cities is predicted to increase by 0.429%. For cities to improve their connectivity above average, they will need to increase their number of establishments. In general, there exists a strong positive relationship between *entrepreneurial activity*, measured as the number of starting entrepreneurs as a percentage of the working population (Marlet and Van Woerkens, 2003), and urban network connectivity (Figure 11). The results show that if a city increases its entrepreneurial activity by 1%, this increases its connectivity with 1.204%. Amsterdam and Alkmaar best fit this model. Cities specialized in *producer services*, have higher network connectivity than cities specialized in other sectors. Of the three indicators, producer services contribute most to corporate networks. Hence, if a city increases its specialization in producer services with 1%, connectivity rises with 1.295% (Figure 12). Cities like Amsterdam, The Hague and Amersfoort best fit this model.

### *The social-economic environment of cities*

In order to examine the relationship between the socio-economic environment and urban network connectivity, the socio-economic index, as presented in the *Atlas voor Gemeenten* report of 2003 (Marlet and Van Woerkens, 2003) is used to make the estimations. The socio-economic index consists of labor market and employment factors that are important for the local economy, such as the degree of unemployment, participation of women in the labor market, education, and poverty. Here, it is contended that a good socio-economic environment contributes to the business climate of cities. In the results we see that this relationship is quite moderate (Figure 13). Similarly, a moderate relationship between human capital and connectivity can be seen (Figure 14). On average, if the proportion of the working population that has a low education level (lower than HBO) decreases with 1%, urban network connectivity increases with 0.33%. For other tested relationships within the dimension of social economic environment, including safety and wages, no relationship to network connectivity is found. In this light, social variables have far less to do with a city's network strength.

### *The spatial environment of cities*

In order to examine the relationship between the spatial environment and urban network connectivity, the attractiveness index is used, as presented in the *Atlas voor Gemeenten* report of 2003 (Marlet and Van Woerkens, 2003). The attractiveness index is a score composed of different variables, such as physical accessibility, cultural amenities, proximity to scenic areas, and the presence of universities. Looking at the relationship between the urban attractiveness index and urban network connectivity (Figure 15), a moderate positive relationship is observed. On average, an increase of 1% on the urban attractiveness score, increases network connectivity with 0.65%. Focusing on two dimensions of the urban attractiveness index, *physical accessibility* and *amenities* (Figure 16 and 17), we observe that there is a weak relationship between a city's physical accessibility and its corporate connectivity to other cities. This means that improving a city's infrastructure does not contribute much to improving its corporate connectivity. However, a very strong relationship is found between connectivity and the amenities present in cities. Cities like Amsterdam, Amersfoort and The Hague fit this model well. However, Rotterdam forms an outlier here. It means that if a city like Rotterdam improves its amenities (physical attractiveness) by 1%, the corporate connectivity will expectedly increase by 0.597%.

## **PART 2: Exploring the Zuidvleugel within Mergers and Acquisitions Networks:**

### *Networks of city collaboration within the M&A network*

Unlike the previous results, the following section concerns outcomes based on M&As. As discussed in the methodological chapter, the two advantages of this data is that it covers the period 2000 – 2009, and that the true value of the investments between firms is known. Using the same statistical techniques discussed in the methodology, the centrality scores for cities within this network have been determined. In the table (Table 9), the outdegree and indegree scores of the M&A data can be seen. The left side of the table concerns the acquiring firms (usually headquarters), who acquire financial control over target firms (usually subsidiaries). It shows the investment power of particular cities over others. The right side concerns the firms in cities that have been acquired, and are known as the targets. It reveals the attractiveness of certain cities to inward investments. The second column refers to the deal values (log) being made in the acquisition. For instance, London ranks 1<sup>st</sup> as the greatest acquiring city within the total nine year period of the network of European M&As, followed by Paris, New York and Amsterdam (4<sup>th</sup>). As with the studies on ownership data, Amsterdam is a strong contender within the world economy, and again proves to be far more powerful than Rotterdam (23<sup>rd</sup>), Den Haag (25<sup>th</sup>) and Utrecht

(45<sup>th</sup>). Even when the investments of these cities are combined, Amsterdam still remains 1.5 times stronger than the rest. In terms of target cities, that are attractive sites to invest in, Amsterdam (4<sup>th</sup>) appears to be more attractive to investors than Rotterdam (32<sup>nd</sup>) and The Hague (42<sup>nd</sup>). Nonetheless, even though these cities score lower, their ranks are still relatively very high considering that 4,406 unique cities exist within the dataset. In this light, we can say that the cities of The Netherlands play an exceptional role within the global economy. Not all cities can rank at the top, but fortunately The Netherlands has one core city. It therefore becomes more interesting to understand the different roles and strengths of Dutch cities, and how their complementarity can be improved. However, this goes beyond the scope of this assignment, but can certainly be interesting for future research.

In the diagram (Figure 18), the M&A network of all the cities within the Zuidvleugel have been mapped. Expectedly, Rotterdam and The Hague are by far the most powerful cities in this network. The significance of the other cities like Leiden, Capelle a.d. IJssel and Delft is very marginal. This does not mean that these cities are unimportant but that their role within the global economy is limited. Their importance is likely to be more at a regional and local level, forming sub-networks that support Rotterdam and The Hague. In the next section, all cities related to the Zuidvleugel have been combined and the related investments calculated. These can be seen in the table (Table 10). On the left side the outward investments from the Zuidvleugel to other cities are seen. It is found that over the period 2000 – 2009, the Zuidvleugel has invested in 132 independent cities. Interestingly, only 7% of these investments are with cities within The Netherlands, while 93% have been transnational. London proves to be the city in which the Zuidvleugel has invested the most (46.5%). This is again similar to the previous results on ownership networks. Next, New York (19.4%) appears to be the second most attractive destination for Zuidvleugel investments, followed by Tokyo (8.6%). In this context, the Zuidvleugel is more economically attracted to the UK, US and Japan than to The Netherlands and the rest of Europe. As an attractive site for inward investments, (right part of the table) it is found that 79 cities invest in the Zuidvleugel. It means that far less cities are attracted to the Zuidvleugel than its own interests in other cities. The list of cities, from Sydney (1<sup>st</sup>) to Utrecht (12<sup>th</sup>), shows in declining order the essential investors into this region. Again it is seen that most investments are from foreign cities (72%). Therefore, because M&As are vital to the development of cities in our globalizing world, and because most of the Zuidvleugel's investments come from afar – it proves that policymakers, planners and developers should incorporate this type of knowledge into their strategies.

#### *Networks of city competition within the M&A network*

So far, all results have only concerned the strengths of economic ties between cities i.e. their collaboration. In this section an entirely different characteristic of city networks is revealed, namely competition networks. To explain this, the scheme (Figure 18) is provided. In this scheme, cities are competitors if they comply with two essential criteria. The first criterion is that these cities be connected to the same cities (market overlap). The second criterion is that these cities should be connected to the same industries. If cities are similar in these aspects, they are regarded as true competitors. In the scheme, we see in criterion 1 that City-A and City-B are connected to exactly the same three cities (A, C, and D). Therefore they have 100% market overlap, and are hereby true competitors. City-C is only connected to two same cities, therefore its market overlap compared to the first two cities, is only 67%, and is therefore less of a competitor. City-D in turn, is not connected to the same cities – as the others, and therefore is not a competitor of the other cities. In the bottom part of the scheme, concerning criterion 2, we see the same approach. In this case it concerns cities A – D and their relationship with industries A – D. The question is how much these cities are connected to the same types of industrial sectors. We see that City-A and City-B have 100% sectoral overlap, while City-C has 33% overlap. City-D has no sectoral overlap with the other three cities. Hence, cities are in competition if they are similar in both market and industrial sector overlap. In this context, City-A and City-B are true contenders of each other, City-C only partially, and City-D not at all.

Based on this approach, the true city competitors within the M&A dataset have been derived. These can be seen in the table (Table 11). The closer cities are to each other the more they are competitors. Therefore, the Zuidvleugel's most important competitors in terms of M&As are (1) Brussels and Amsterdam, followed by (2) Milan and Rome, then (3) London and Stockholm, and so forth. In the network diagram (Figure 19), the Zuidvleugel and its competitors are indicated (red dots). The horizontal line of cities (grey squares) at the middle of the diagram shows all those cities in which their markets and industrial sectors overlap. The Zuidvleugel is in competition with these other red cities, for the simple reason of this overlap. The open squares represent other cities which the competitors are dissimilarly connected to.

### **Conclusions and recommendations:**

In this report it is demonstrated that today cities and urban regions like the Zuidvleugel are greatly impacted on by global corporate networks, such as foreign direct investments and ownership networks between firms. Economic booms and recessions within this worldwide system have strong effect on the fate of cities. These firms of these networks increasingly span the globe searching for cost effective ways of producing goods and services or finding new markets to sell in. Through this process, networks of collaboration and competition between cities have come into existence. In this context it is also shown in this report that economic networks between cities are nothing new, and have been evolving for centuries, evolving through various technological innovations such as electricity, motorization and ICT. In this way, it is shown that the importance of cities has a lot to do with their network developments over time. These networks have gradually destabilized previously monocentric cities into polycentric urban systems, meaning that today exogenous influences are just as influential to the development of a city as the activities happening within a city's municipal boundaries.

Furthermore, it is argued that although various scholars have similarly demonstrated the importance of the coexistence of intercity and inner-city forces, policymakers and planners do not take this into account when strategizing about the future of the city. One of the main reasons for this is that almost all theories on the importance of networks have never been empirically verified, and if so, with little relevance to a particular city. Therefore, the given assignment to empirically show the relative importance of the Zuidvleugel within worldwide economic networks has been an important opportunity. The research has been carried out based on two research questions. The first has aimed to reveal which cities the Zuidvleugel collaborates with within different types of network and the hierarchies of their importance, while the second question has aimed to show which cities in the world are the Zuidvleugel's main competitors. Central to these two questions has been the interest in discovering how much economic impact comes from far away, compared to how much happens at a local level. Two types of economic network data have been explored to answer these questions. The first type of data concerns the ownership shares of one firm in another, while the second type of data concerns foreign direct investments between firms. Furthermore, because network data is very scarce, the results presented in this report are unique.

In the results it is firstly shown that not just the Zuidvleugel, but the whole of The Netherlands is highly dependent on international economic linkages, while only a small part takes place within its boundaries. It is shown in different datasets that that Amsterdam is by far the most internationally connected Dutch city, and three times stronger than Rotterdam. It is argued that Amsterdam's importance is due to its centuries old history as an international city. Amsterdam is strong within global, European and Dutch scales of corporation, meaning that it serves as an important connector between different scales of firm. Rotterdam and The Hague only increase in importance as the scale drops from global to local. Furthermore, the Noordvleugel is twice as globally connected as the Zuidvleugel. However, at the national level, Rotterdam is the most powerful city, and is one and a half times stronger than Amsterdam. It is therefore recommended that the Noordvleugel should be the main focus for the

improvement of The Netherlands' international importance within the global economy, while the Zuidvleugel should be developed more as a national powerhouse. This does not mean that the Zuidvleugel should not develop its international relations, but that the emphasis should be different to that of the Noordvleugel. It is also seen that other Dutch cities play an extremely limited role in the global and European network and that only within Dutch regional networks do their importance rise. What all this shows is that strong hierarchies of importance exist amongst cities, in which they all play different roles. In this light, it is observed in all the provided studies that only a handful of cities hold the lion's share of economic ties and that these few cities are the ones that command the world economy. For instance, it has been shown that only New York, London, Paris and Tokyo claim 25% of world economic activity. Amsterdam falls into the second category of cities, below these four, but still plays a vital role in the world and Europe. It is via Amsterdam that The Netherlands gets its strong world economic status, and it is suggested that other Dutch cities find ways to improve their ties with Amsterdam. This recommendation is reinforced by the fact that the Noordvleugel and Zuidvleugel's hardly collaborate while their competitors are essentially in distant places. Therefore it would be more interesting to see how different levels of Dutch cities can be complimentary and reinforce each other, to take on the growing challenges in places like Pacific Asia, the US and Latin America. The idea of complimentary is reinforced even further by the fact that the Zuidvleugel is primarily a goods economy oriented region while the Noordvleugel is essentially related to information economies. Although this discovery is not entirely new, it is new in the sense that it verified within analyses based on network data. In a study on the relationship between urban indicators and network strength, it has been shown that the most important indicators are those cities that specialize in producer services, cities that stimulate a high density of entrepreneurial activity, and cities that are most attractive. Because cities in the Noordvleugel generally score better on these qualities than cities in the Zuidvleugel, they therefore score far higher in international economic relations, which ultimately benefit these regions better. The above findings are derived from the research based on corporate ownership networks. The next part of the conclusion stems from the analysis on FDI networks.

Again Amsterdam is by far the most powerful city in terms of investing in other cities, as well as being an attractive destination for investments from abroad. When observing only investments related to the Zuidvleugel, it has been found that the vast majority of inward and outward investments are international and that only a few occur within the boundaries of The Netherlands. Almost all these investments are related to Rotterdam and The Hague, and other cities like Leiden, Delft and Capelle a.d. IJssel play a very marginal role. London proves to be the primary city for the Zuidvleugel's outward investments, followed at a distance by New York then Tokyo. Sydney, Cagliari, New York and London prove to be the greatest investors into the Zuidvleugel over the past nine years. Therefore, because M&As are vital to the development of cities in our globalizing world, and because most of the Zuidvleugel's investments come from afar – it proves that policymakers, planners and developers should incorporate this type of knowledge into their strategies.

In the next analysis, a special technique has been used to identify the true competitors of the Zuidvleugel based on market and industrial sector overlap. Brussels and Amsterdam prove to be the main competitors of the Zuidvleugel. As mentioned before, in a steadily globalizing world economy, it would be more interesting to see how the Noordvleugel and Zuidvleugel can collaborate more, and compete less. More interesting is to see how the Randstad as a whole can take on the challenges from afar, by forming a complimentary unit. Other important competitors are Milan and Rome, Stockholm and London. Interestingly London is both a strong competitor and collaborator of the Zuidvleugel – a phenomenon known as co-opetition in the literature. It means that ideally cities should both compete and collaborate to a certain degree.

In the final analysis, by applying forecasting techniques to the nine year period of M&As, an approximate estimation of cities has been made up until 2015 (Table 12). The major competitors of the Zuidvleugel have been included. Because London holds a much higher share of total M&As to the rest of these regions, it imbalances the final graph. Therefore it has been left out. The important thing to know is that London's trend is expected to drop in the coming years. Furthermore, the impact of the current recession is evident in both graphs. The top graph represents the expected investments of these cities into other cities of the world. As can be seen, the Zuidvleugel's ability to invest in other cities is predicted to drop slightly in the coming years. Rome and Stockholm's investments will expectedly drop far steeper. Amsterdam, Brussels and Milan's investments into other areas are expected to rise strongly. Next, in terms of attractiveness to investments from afar, the second graph indicates that Milan, Amsterdam and Brussels are expected to be highly attractive to outside investments in the coming years. Rome, Stockholm and the Zuidvleugel are predicted to drop moderately in terms of attractiveness to foreign investments.

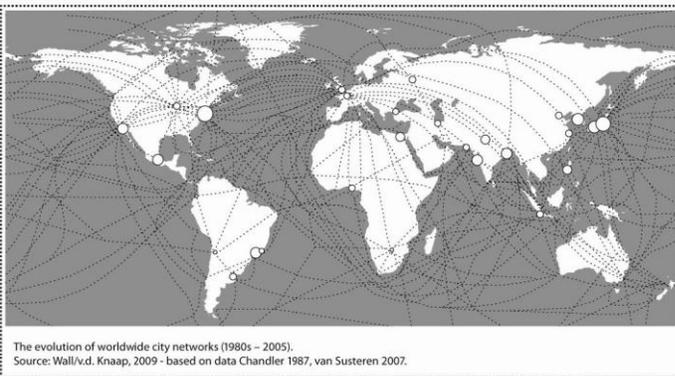
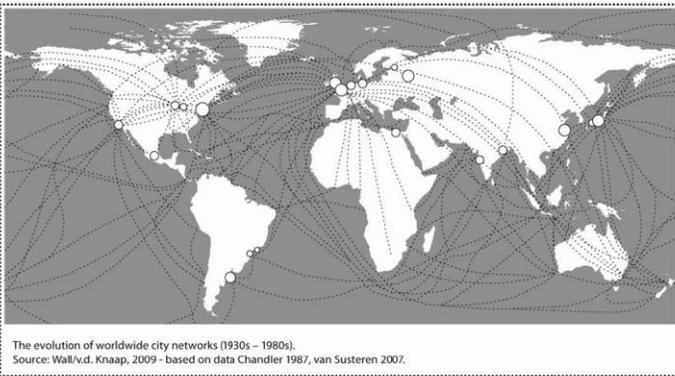
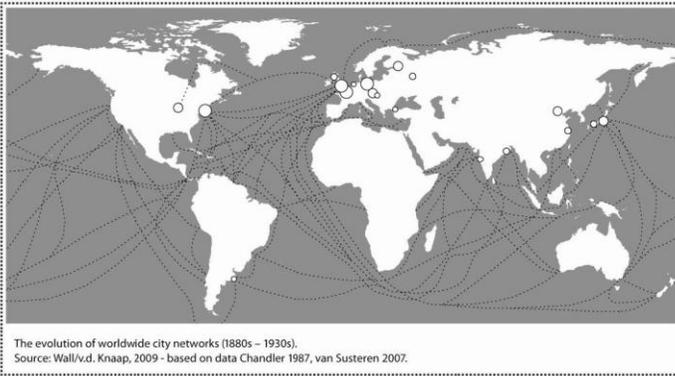
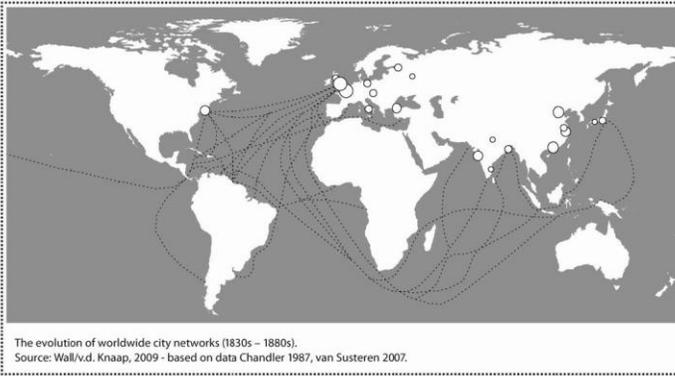
This report has contributed to an understanding of the relative importance of the Zuidvleugel within the world economy and has shown that its development is just as much dependent on foreign economic activities as those found within its borders. It has served as a first exploration into developing a complimentary tool which can be used to develop the Zuidvleugel within the global economy. Furthermore, partner and competitor cities of the Zuidvleugel have been identified, plus its sectoral strengths and weaknesses. It is also evident that this region's growth in investments has been moderate in the past years and will expectedly drop in the near future. Within this context it now becomes interesting to not sit back and watch the Zuidvleugel decline, but to instead come up with strategies on how to improve its attractiveness to foreign investments. Two specific recommendations will now be made on how future research can tackle this issue.

As has been discussed before, a new type of planning is needed which integrates the understanding of the Zuidvleugel's economic networks to knowledge of the spatial programming and organization of this regions. This is illustrated in the diagram (Figure 20), in which three layers of understanding are portrayed. At the top we see the layer consisting of the Zuidvleugel's collaborating cities. Beneath that is the layer of the Zuidvleugel's competitors. At the bottom, we see the layer that represents the physical, spatial context of this region. It is argued that planning within a globalizing world depends on the integration of these three systems, or as it were - 'planning beyond borders'. Investors are attracted to places like the Zuidvleugel because they hold certain economic, social and environmental qualities, which can be profitable to business. As can be seen in the provided examples (Table 13), data on these urban characteristics are available for many cities. In this case, data is available on human resources, types of industries, innovation levels, living environments and transportation and infrastructure. By measuring the influence of this type of urban data on the economic network data used in this report, specific urban programs can be identified for cities. This type of regression model can provide a city insight into which social, economic and environmental programs will effectively improve the position of that city over time, within the context of the global economic system.

## Literature

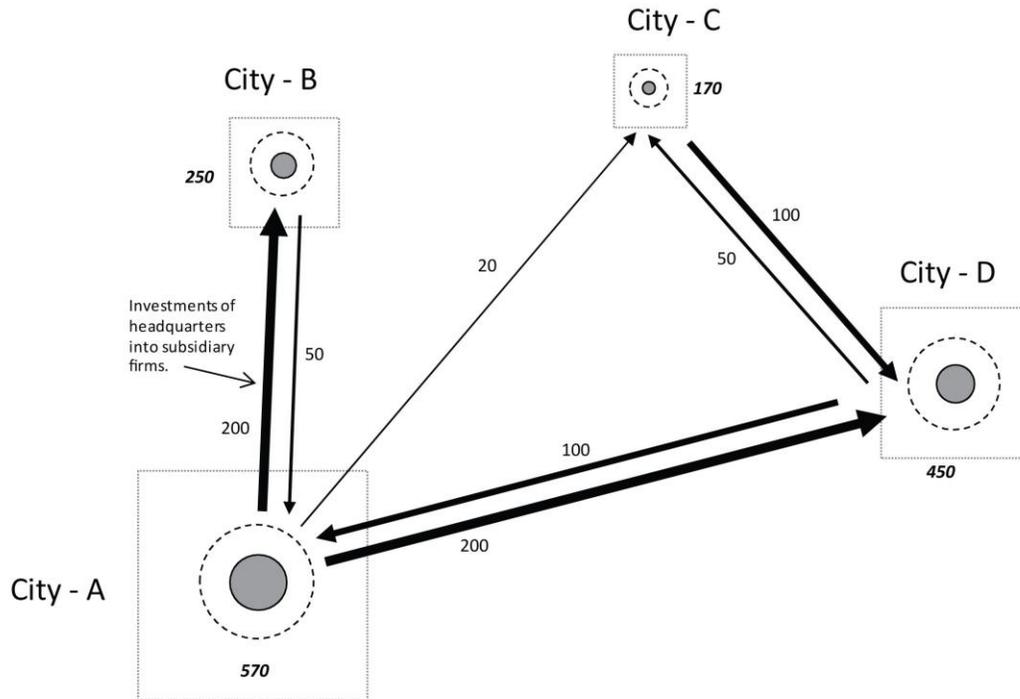
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**Figure 1:** The evolution of world city networks (1830 – 2005).

Source Wall, 2009a – based on Chandler 1987, van Susteren 2007



**Figure 2:** Hypothetical scheme of corporate networks.

Source Wall, 2009

-  Total corporate investments
-  Urban development indicators e.g. innovation, infrastructure, education, attractiveness and creativity

National performance indicators <i>various sources</i>	Global corporate connectivity	
	Outdegree	Indegree
GDP per capita	0.885	0.905
R&D personal	0.651	0.611
Business Efficiency Index	0.742	0.786
Innovation Index	0.837	0.826
Technical Achievement Index	0.746	0.691
Patents Granted	0.681	0.531
Global Competitiveness Index	0.824	0.741
Institutional Development	0.767	0.815
Market Efficiency	0.681	0.708
Technological Readiness	0.782	0.792
Business Sophistication	0.845	0.635
Internet Services	0.817	0.881
Internet Bandwidth	0.841	0.803
ICT Expenditure	0.901	0.902
Infrastructure	0.841	0.741

All significant at the 0.001 level

**Table 1:** Correlations between corporate connectivity and development indicators.

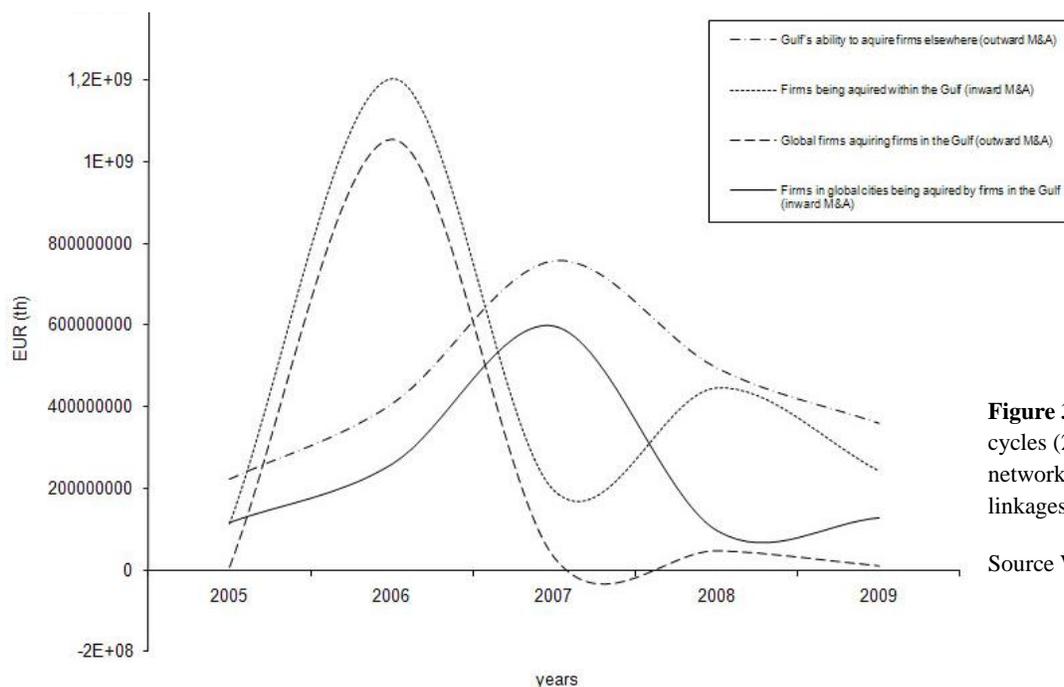
Source Wall, Slegers and v.d. Knaap 2008

	Model (1) - $C_{ij}$	Model (2) - $C_{ij}$	Model (3) - $C_{ij}$	Model (4) - $C_{ij}$
<b>Home Country</b>				
GDP	1.34 (.069)**	1.36 (.076)**		
GDP per worker	0.23 (.076)**	0.24 (.074)**		
Remoteness	★ -1.56 (.154)**	-1.52 (.146)**		
Openness	★ 0.99 (.198)**	1.04 (.141)**		
Technology exports	0.37 (.102)**	0.39 (.100)**		
Stock market capitalization	0.59 (.103)**	0.59 (.097)**		
Credit provision	0.34 (.181)	0.35 (.175)*		
<b>Host country</b>				
GDP	0.62 (.047)**		0.60 (.035)**	
GDP per worker	★ -0.22 (.055)**		-0.23 (.047)**	
Remoteness	★ 1.31 (.161)**		0.95 (.129)**	
Openness	0.35 (.104)**		0.32 (.080)**	
Technology exports	0.05 (.056)		0.05 (.046)	
Fuels exports	0.02 (.037)		0.02 (.031)	
Quality of institutions	★ 0.45 (.091)**		0.46 (.078)**	
Corporate taxes	-0.49 (.451)		-0.73 (.038)	
<b>Bilateral</b>				
Physical distance	-0.70 (.073)**	-0.71 (.073)**	-0.48 (.064)**	-0.41 (.059)**
RIA dummy	-0.13 (.108)	-0.31 (.115)**	0.23 (.101)**	0.15 (.099)
Common language dummy	0.32 (.106)**	0.34 (.175)**	0.35 (.098)**	0.36 (.098)**
Common history dummy	0.22 (.146)	0.14 (.133)	0.70 (.157)**	0.54 (.134)**
Sectoral distance	-0.02 (.050)	0.06 (.110)	-0.03 (.047)	0.06 (.133)
GDP difference	-0.15 (.046)**	-0.15 (.066)*	-0.17 (.033)**	-0.19 (.036)**
Observations	4687	4687	4687	4687
Home country fixed effects	NO	NO	YES	YES
Host country fixed effects	NO	YES	NO	YES
Log pseudolikelihood	-2251	-2170	-1921	-1809
AIC	4547	4587	3957	3936
LR test of overdispersion	1028.2**	685.4**	402.9**	142.8**

\*\*p<0.01, \*p<0.05; robust standard errors in parentheses. All variables are in natural logs, except for dummy variables, quality of institutions, and corporate taxes.

**Table 2:** Regression analysis between corporate connectivity and development indicators.

Source Wall, Burger 2008



**Figure 3:** Merger and acquisition cycles (2005 – 2009) of Gulf city networks (global and national linkages)

Source Wall 2010



**Figure 4:** GIS map of 9,243 multinational linkages (share ownership), between 2,259 unique cities

Source Wall, 2009a – based on Fortune and Lexis-Nexus data, 2005

*Outdegree and indegree of global, European and Dutch corporate networks (data 2005/2006).*

Global headquarter city	Outdegree	Outdegree rank	Global subsidiary city	Indegree	Indegree rank
New York	473	1	New York	135	1
Dusseldorf	234	2	London	82	2
Munich	206	3	Dusseldorf	80	3
Zurich	192	4	Brussels	66	4
PaloAlto	162	5	Paris	65	5
London	147	6	Houston	59	6
Irving	110	7	Frankfurt	54	7
Paris	110	7	<b>Amsterdam</b>	49	8
New Brunswick	109	8	Milan	47	9
<b>Amsterdam</b>	102	9	Zurich	47	9
Brussels	88	10	Madrid	40	10
<b>The Hague</b>	68	11	Vienna	40	10
Frankfurt	67	12	Tokyo	39	11
Chicago	63	13	Singapore	38	12
Houston	60	14	Atlanta	37	13
Atlanta	55	15	Toronto	36	14
Wolfsburg	54	16	Mexico City	34	15
Detroit	52	17	Munich	30	16
Calgary	49	18	Bangkok	28	17
Gerlingen	48	19	Hamburg	28	17
Lausanne	43	20	Dublin	27	18
Stuttgart	43	20	Hong Kong	27	18
Toyota	40	21	Barcelona	26	19
Tokyo	37	22	Buenos Aires	26	19
Cincinnati	36	22	Luxembourg	24	20
Schaumburg	35	23	<b>Rotterdam</b>	23	21
Stavanger	34	24	Berlin	22	22
Philadelphia	32	24	Taipei	22	22
Chesterbrook	31	25	Montreal	20	23
Trieste	28	26	Turin	20	23
<b>Rotterdam</b>	n/a	n/a	<b>Utrecht</b>	12	31
<b>Utrecht</b>	n/a	n/a	<b>The Hague</b>	11	32
199 cities	N = 3,618				

**Table 3:** Global top 100 headquarter (outdegree) linkages with subsidiaries (indegree)

Source Wall, 2009b – based on Fortune and Lexis-Nexus data, 2005

Amsterdam's linkage strengths with other cities at global, European and Dutch network scales.

To city	Outdegree	From city	Indegree
<i>Global corporate network</i>			
Paris	12	Brussels	7
Brussels	8	Paris	6
Hong Kong	7	Dusseldorf	3
London	7	London	3
Atlanta	6	Dearborn	2
Madrid	5	Frankfurt	2
Toronto	5	Munich	2
Velizy	5	New York	2
<i>European corporate network</i>			
London	13	Paris	16
Zurich	8	Vevey	7
Tokyo	8	Munich	5
Madrid	8	Brussels	3
Paris	7	London	3
Frankfurt	6	Aachen	2
Dublin	6	Auburn Hills	2
Toronto	5	New York	2
<i>Dutch corporate network</i>			
Paris	130	Utrecht	357
London	99	The Hague	18
Dublin	66	Rotterdam	13
Singapore	49	Heerlen	7
Brussels	42	Arnhem	5
Milan	42	Eindhoven	4
Redfern	41	Breda	3
Hong Kong	35	Nijkerk	1

**Table 4:** Regression analysis between corporate connectivity and development indicators.

Source Wall, Burger 2008

*Continued*

European headquarter city	Outdegree	Outdegree rank	European subsidiary city	Indegree	Indegree rank
Paris	376	1	Paris	154	1
London	302	2	London	117	2
Zurich	232	3	Madrid	70	3
<b>Amsterdam</b>	87	4	New York	67	4
Basel	83	5	Brussels	55	5
Oslo	77	6	Singapore	47	6
Frankfurt	71	7	Munich	45	7
Vevey	71	8	Hong Kong	42	8
Espoo	62	9	Milan	42	8
Munich	59	10	Vienna	41	9
Dusseldorf	53	11	Buenos Aires	40	10
Chicago	47	12	Zurich	39	11
Berlin	45	13	Dublin	37	12
Brussels	42	14	Frankfurt	36	13
Edinburgh	38	15	<b>Amsterdam</b>	33	14
Tampere	38	15	Tokyo	33	14
Santa Monica	36	16	Barcelona	23	15
<b>The Hague</b>	31	17	Mexico City	23	15
Wolfsburg	31	17	Bangkok	22	16
Göteborg	30	18	Dusseldorf	22	16
Leverkusen	29	19	Johannesburg	22	16
La Courneuve	27	20	Luxembourg	22	16
Saint Paul	27	20	Prague	22	16
Rome	22	21	Budapest	21	17
Trieste	21	22	Jakarta	21	17
Stuttgart	20	23	Lisbon	21	17
Bochum	19	24	Oslo	21	17
Gerlingen	19	24	Toronto	21	17
Voorhees	18	25	Hamburg	20	18
<b>Utrecht</b>	12	30	Athens	19	19
<b>Rotterdam</b>	3	38	<b>The Hague</b>	10	27
			<b>Rotterdam</b>	9	28
			<b>Utrecht</b>	9	28
199 cities	N = 2,820				

**Table 5:** European top 100 headquarter (outdegree) linkages with subsidiaries (indegree)

Source Wall, 2009b – based on Fortune and Lexis-Nexus data, 2005

Continued

Dutch headquarter city	Outdegree	Outdegree rank	Dutch subsidiary city	Indegree	Indegree rank
<b>Amsterdam</b>	2,787	1	<b>Amsterdam</b>	884	1
<b>Utrecht</b>	2,087	2	London	452	2
<b>Rotterdam</b>	1,223	3	Paris	258	3
<b>The Hague</b>	1,155	4	<b>Utrecht</b>	238	4
Arnhem	734	5	Wilmington	213	5
Eindhoven	484	6	Brussels	192	6
Heerlen	294	7	Dublin	190	7
Ritthem	90	8	<b>The Hague</b>	188	8
Rijen	61	9	<b>Rotterdam</b>	178	9
Nijkerk	26	10	Luxembourg	172	10
Meppel	14	11	Hong Kong	161	11
Den Bosch	12	12	Delaware	107	12
Breda	12	12	Singapore	105	13
Best	11	13	Walton	87	14
Bergen op Zoom	10	14	Milan	85	15
Sittard	5	15	Madrid	83	16
Tilburg	4	16	Hamburg	73	17
Rijssen	1	17	Zurich	68	18
Veenendaal	1	17	Stockholm	66	19
Zwolle	1	17	Dover	63	20
New York	n/a	n/a	Shanghai	63	20
Paris	n/a	n/a	Eindhoven	62	21
London	n/a	n/a	New York	62	21
			Lisbon	59	22
			Melbourne	58	23
			Houston	55	24
			Vienna	55	24
			Buenos Aires	54	25
			Bunnik	54	25
			Warsaw	54	25
			Mexico City	50	26
			Arnhem	49	27
			Budapest	49	27
199 cities	N = 9,012				

**Table 6:** Dutch top 100 headquarter (outdegree) linkages with subsidiaries (indegree)

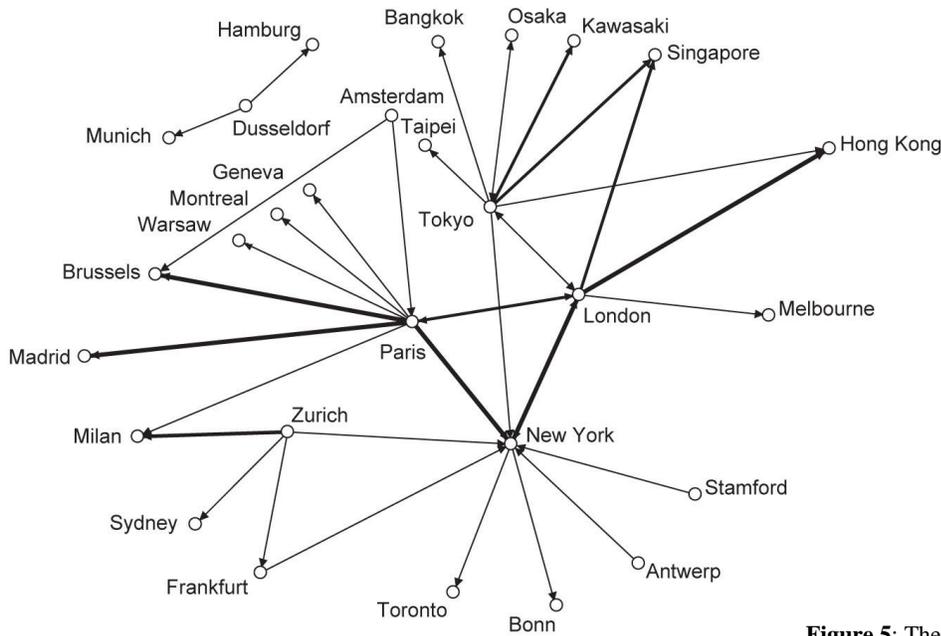
Source Wall, 2009b – based on Reach and Lexis-Nexus data, 2005

*Outdegree strengths of Randstad cities, within the top 100 Dutch corporate network (data 2005/2006).*

Rank	Amsterdam	Rotterdam	Utrecht	The Hague
1	Amsterdam	474	London	120
2	Paris	130	Walton	87
3	London	99	The Hague	68
4	Dublin	66	Rotterdam	62
5	Singapore	49	Dublin	58
6	Brussels	42	Paris	51
7	Milan	42	Hamburg	22
8	Redfern	41	Epping	21
9	Hong Kong	35	Jerusalem	20
10	Sydney	35	Mexico City	19
			Amsterdam	357
			Utrecht	211
			London	105
			Willemstad	118
			Brussels	116
			Luxembourg	110
			London	86
			Rotterdam	83
			Hong Kong	80
			Tortola	49
			Paris	45
			Wilmington	167
			Dover	51
			The Hague	51
			Houston	48
			Melbourne	32
			Cedar Rapids	22
			Delaware	21
			Amsterdam	18
			Edinburgh	18

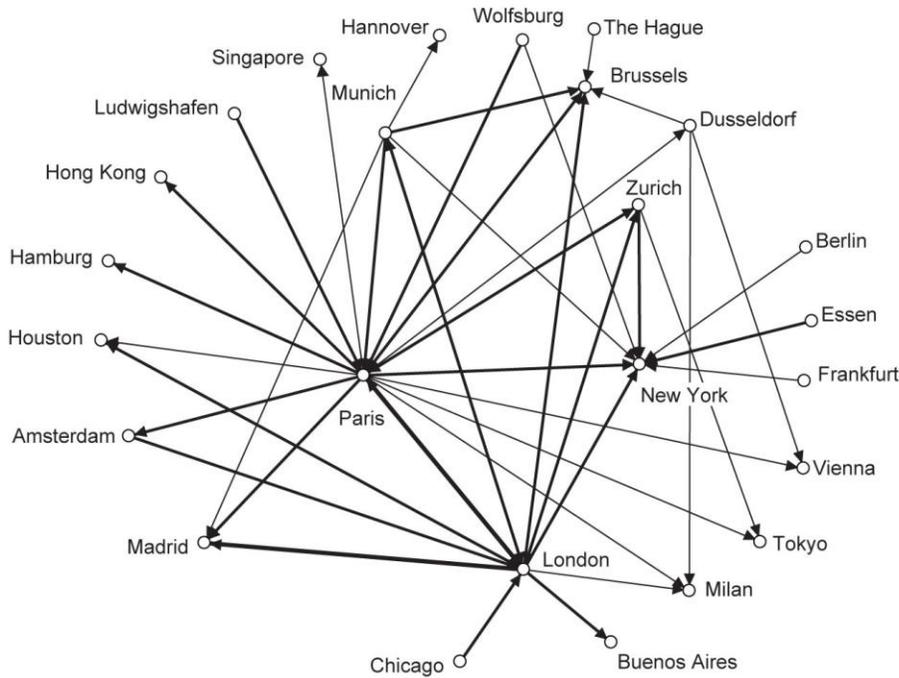
**Table 7:** The strongest linkages of G4 cities to other cities within the top 100 Dutch headquarter network

Source Wall, 2009b – based on Reach data, 2005



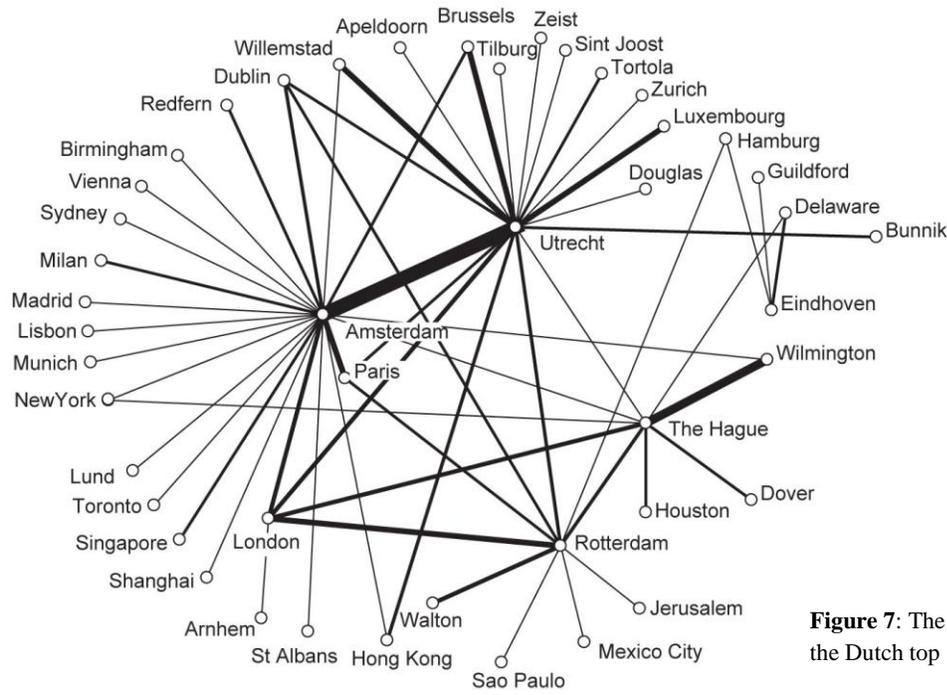
**Figure 5:** The most important linkages within the Global top 100 headquarter network

Source Wall, 2009a – based on Fortune and Lexis-Nexus data, 2005



**Figure 6:** The most important linkages within the European top 100 headquarter network

Source Wall, 2009a – based on Fortune and Lexis-Nexus data, 2005



**Figure 7:** The most important linkages within the Dutch top 100 headquarter network

Source Wall, 2009a – based on Reach data, 2005

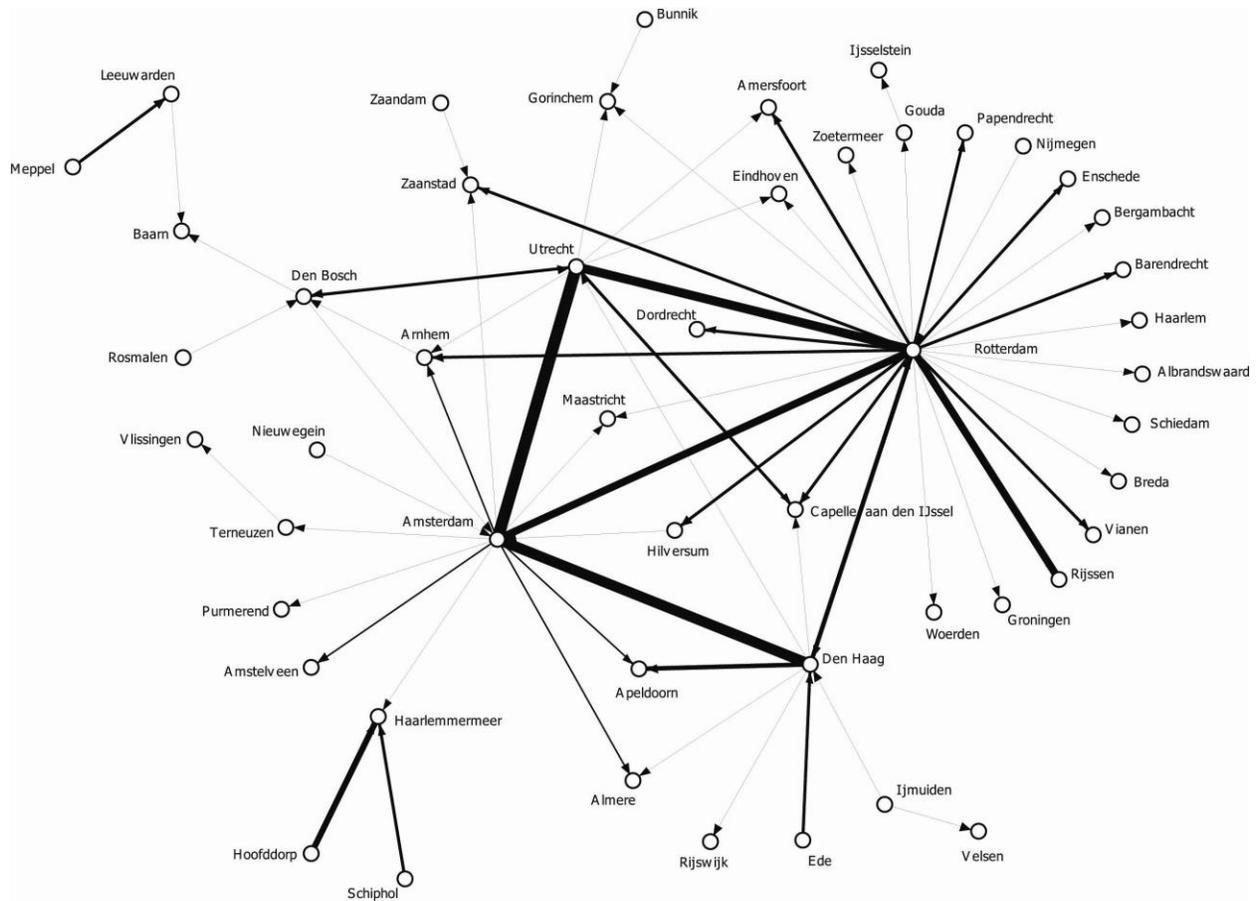
Rank	City	International links	National links	City	Goods	City	Information	City	(R) Business services	City	(S) Business services	City	(R) Insurance	City	(S) Insurance	City	(R) Real estate	City	(S) Real estate	City	(R) Wholesale trade	City	(S) Wholesale trade
1	Amsterdam	12188	14906	Rotterdam	2485	Amsterdam	2703	Rotterdam	330	Utrecht	835	Den Haag	382	Rotterdam	259	Utrecht	576	Rotterdam	382	Amsterdam	321	Amsterdam	382
2	Rotterdam	8298	9834	Amsterdam	930	Amsterdam	2531	Amsterdam	298	Amsterdam	321	Amsterdam	324	Amsterdam	161	Amsterdam	301	Amsterdam	161	Amsterdam	301	Amsterdam	301
3	Utrecht	7045	2999	Nieuwegein	555	Rotterdam	2421	Utrecht	165	Zist	278	Utrecht	222	Utrecht	222	Amsterdam	185	Amsterdam	185	Amsterdam	185	Amsterdam	185
4	Den Haag	5138	2292	Rijssen-Hilvliet	542	Den Haag	2006	Gouda	320	Amsterdam	270	Den Haag	201	Den Haag	201	Den Haag	80	Den Haag	75	Den Haag	75	Den Haag	75
5	Nieuwegein	2027	846	Utrecht	468	Den Bosch	624	Amsterdam	116	Haarlem	116	Den Haag	254	Utrecht	54	Utrecht	94	Utrecht	54	Utrecht	94	Utrecht	94
6	Best	1922	799	Amsterdam	424	Amsterdam	549	Amsterdam	108	Amsterdam	107	Utrecht	236	Utrecht	38	Utrecht	46	Utrecht	38	Utrecht	46	Utrecht	46
7	Amhem	1804	723	Amsterdam	286	Amsterdam	526	Amsterdam	98	Amsterdam	98	Utrecht	67	Utrecht	67	Utrecht	68	Utrecht	68	Utrecht	68	Utrecht	68
8	Amhem	1642	705	Amsterdam	286	Amsterdam	526	Amsterdam	98	Amsterdam	98	Utrecht	67	Utrecht	67	Utrecht	68	Utrecht	68	Utrecht	68	Utrecht	68
9	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
10	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
11	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
12	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
13	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
14	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
15	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
16	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
17	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
18	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
19	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
20	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
21	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
22	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
23	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
24	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
25	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
26	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
27	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
28	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
29	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
30	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
31	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
32	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
33	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
34	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
35	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
36	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
37	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
38	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
39	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
40	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
41	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
42	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
43	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
44	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
45	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
46	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
47	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
48	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
49	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26
50	Amsterdam	1188	1148	Amsterdam	222	Amsterdam	448	Amsterdam	80	Amsterdam	80	Utrecht	59	Utrecht	59	Utrecht	26	Utrecht	26	Utrecht	26	Utrecht	26

Totals 89724 42159 16077 26082 3705 3688 2605 2584 1308 4202 4160

■ Zuidvleugel cities  
□ Noordvleugel cities

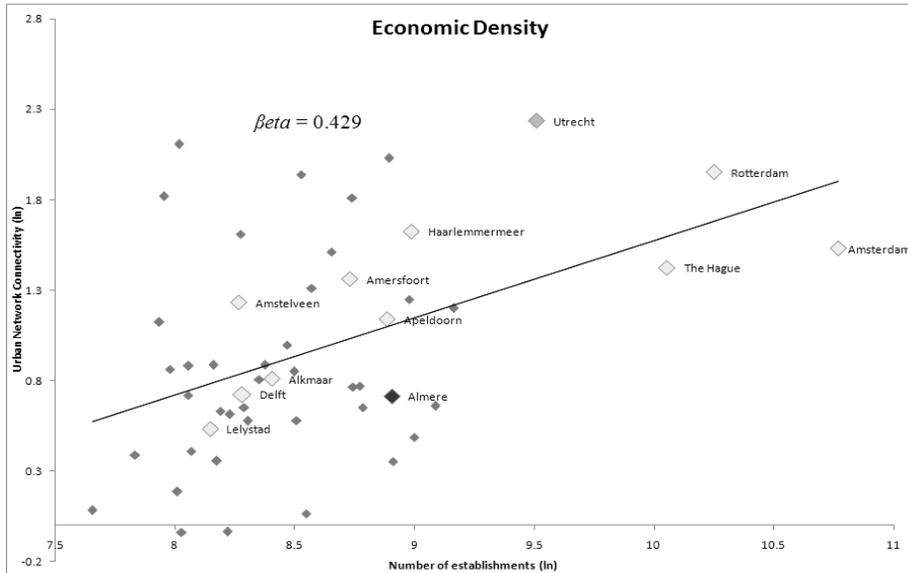
**Table 8:** The most important international and national linkages of Dutch cities (by sector), within a database of 111 883 Dutch corporate connections. H = headquarter relations, S = subsidiary relations  
Source Wall, 2010 – based on Reach data, 2007





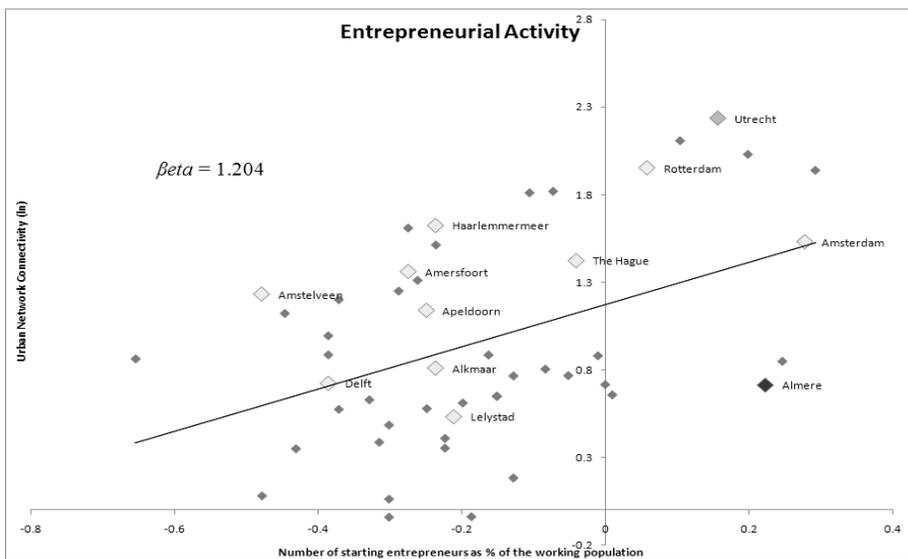
**Figure 9:** The most important linkages between Dutch cities, based on 42159 corporate linkages

Source Wall, 2010 – based on Reach data, 2007



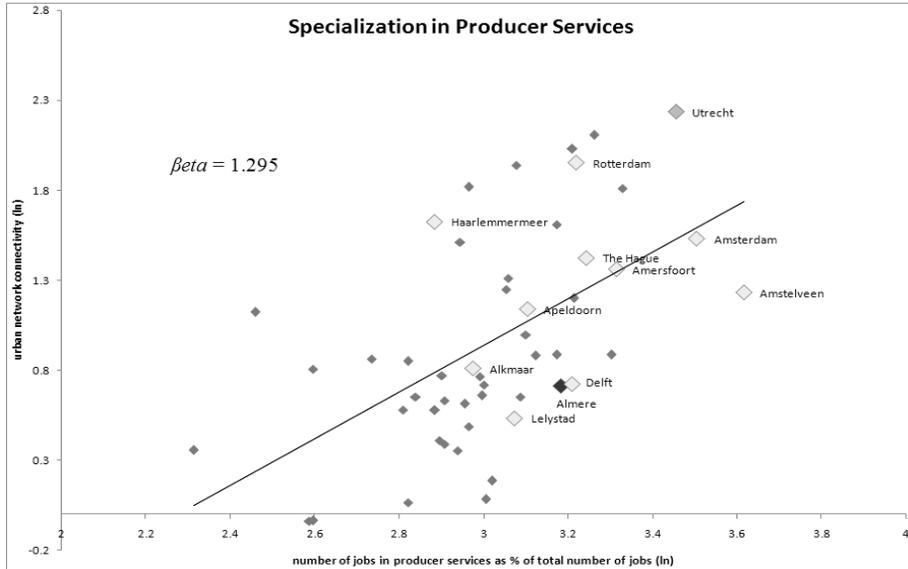
**Figure 10:** Estimating Dutch city connectivity on the basis of economic density (number of establishments located in cities)

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



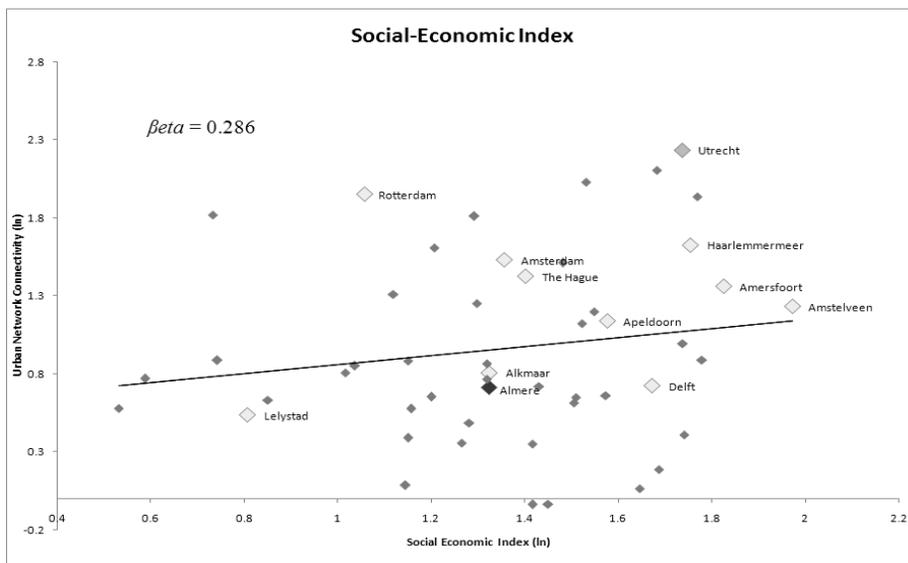
**Figure 11:** Estimating Dutch city connectivity on the basis of entrepreneurial activity

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



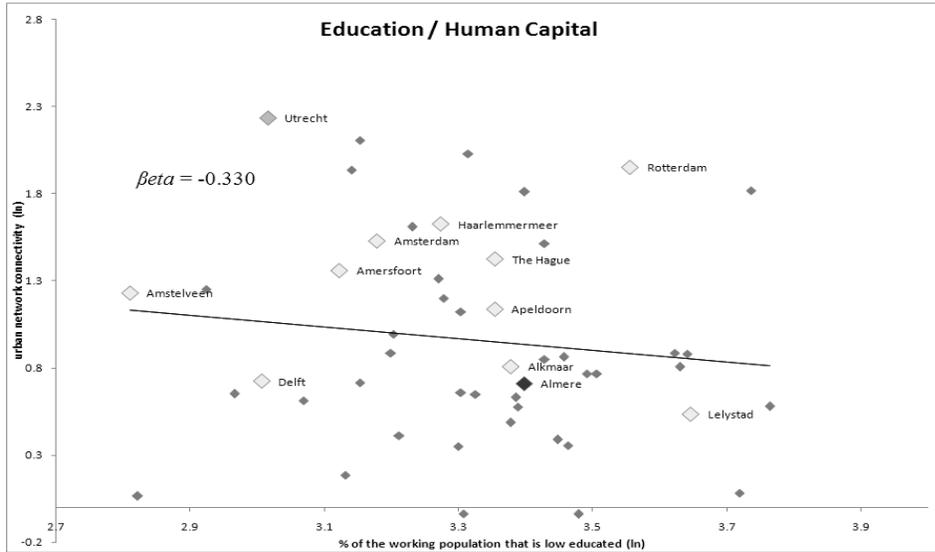
**Figure 12:** Estimating Dutch city connectivity on the basis of specialization in producer services

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



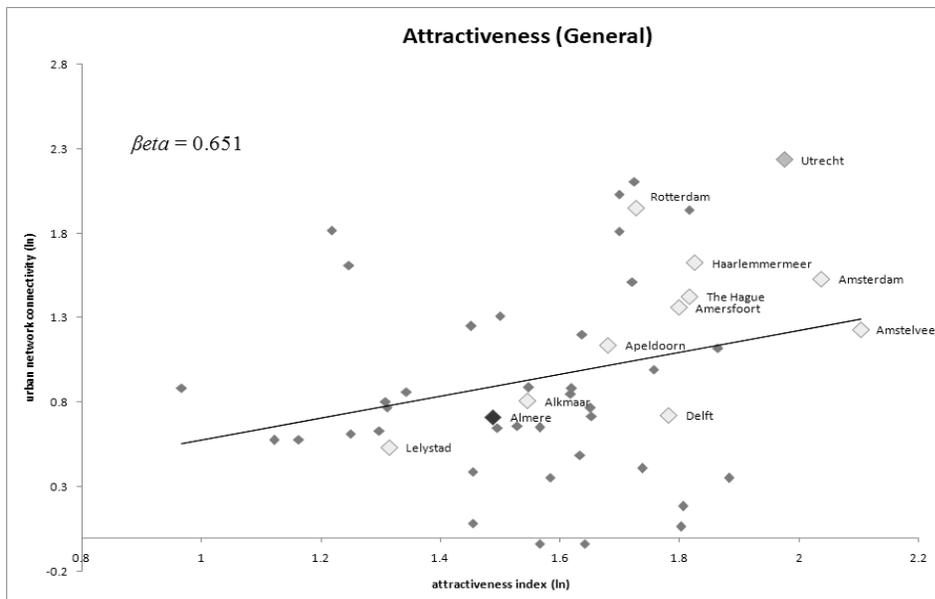
**Figure 13:** Estimating Dutch city connectivity on the basis of the socio-economic index

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



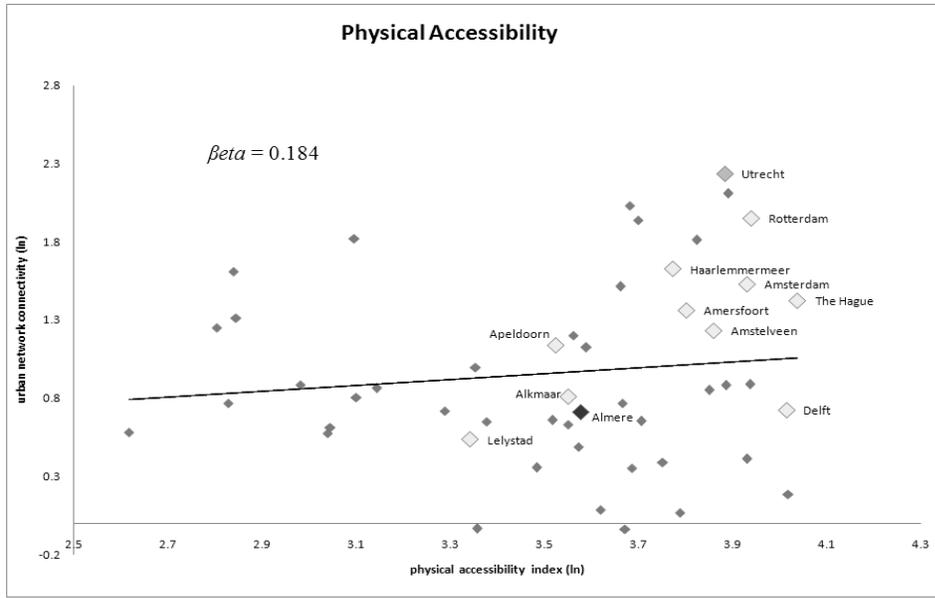
**Figure 14:** Estimating Dutch city connectivity on the basis of education/human capital

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



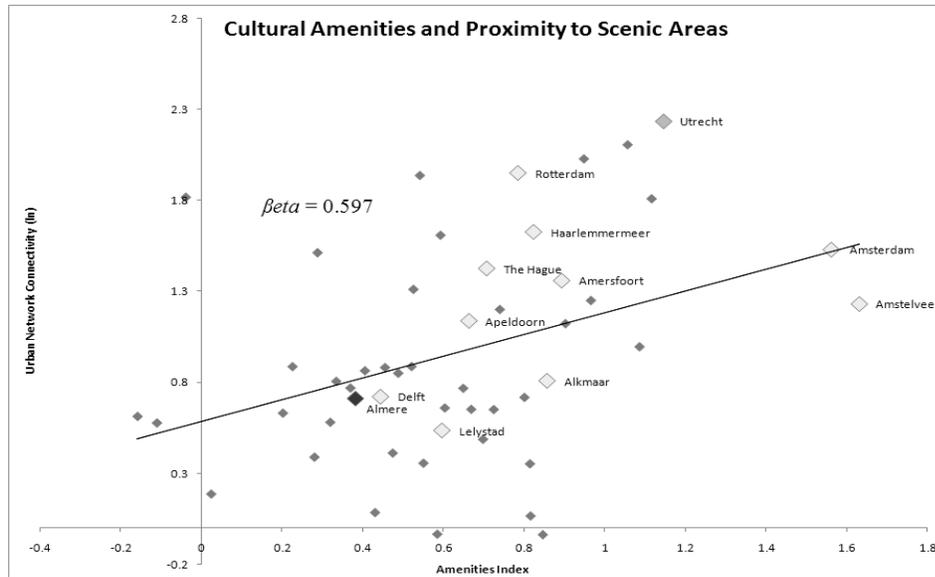
**Figure 15:** Estimating Dutch city connectivity on the basis of attractiveness

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



**Figure 16:** Estimating Dutch city connectivity on the basis of physical accessibility

Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003



**Figure 17:** Estimating Dutch city connectivity on the basis of cultural amenities and proximity to scenic areas

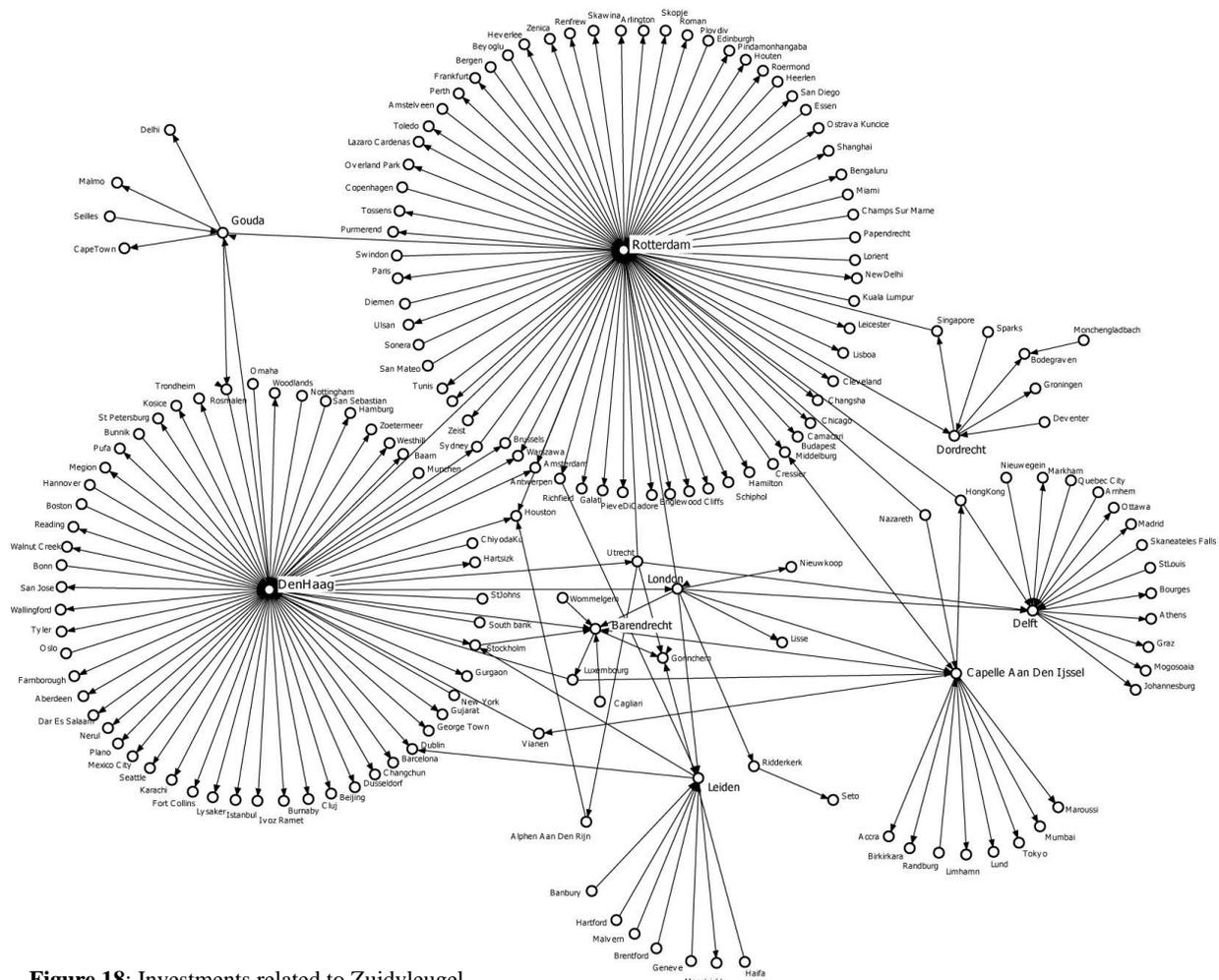
Source Wall and Burger 2008 – based on data Reach 2007 and Nyfer 2003

Outward and inward investments (M&As 2000 - 2009)

Aquiror Headquarter city	Outdegree Outward investments	Outdegree rank	Target Subsidiary city	Indegree Inward investments	Indegree Rank
London	10.663	1	London	4.304	1
Paris	4.572	2	Paris	1.467	2
New York	2.169	3	Madrid	1.149	3
<b>Amsterdam</b>	2.023	4	<b>Amsterdam</b>	956	4
Munchen	2.009	5	Dublin	955	5
Madrid	2.003	6	Milano	936	6
Stockholm	1.993	7	Stockholm	752	7
Milano	1.577	8	Brussels	670	8
Frankfurt	1.442	9	Barcelona	657	9
Brussels	1.175	10	Manchester	623	10
Dublin	1.086	11	Hamburg	577	11
Roma	1.028	12	Cambridge	571	12
Luxembourg	1.020	13	Roma	542	13
Helsinki	959	14	New York	520	14
Edinburgh	889	15	Warszawa	515	15
Boston	872	16	Edinburgh	509	16
Vienna	838	17	Munchen	486	17
Copenhagen	835	18	Leeds	473	18
Barcelona	762	19	Frankfurt	439	19
Tokyo	636	20	San Diego	428	20
Antwerpen	570	21	Dusseldorf	426	21
Lisboa	553	22	Berlin	416	22
<b>Rotterdam</b>	547	23	Bristol	410	23
Zurich	546	24	Praha	401	24
<b>Den Haag</b>	527	25	Moscow	390	25
Dusseldorf	505	26	Vienna	384	26
Goteborg	480	27	Lisboa	380	27
Bilbao	474	28	Helsinki	377	28
Hamburg	438	29	Glasgow	375	29
Birmingham	428	30	Birmingham	368	30
Menlo Park	419	31	San Francisco	352	31
Sydney	392	32	<b>Rotterdam</b>	345	32
Santa Clara	389	33	Bucuresti	340	33
Washington	386	34	Budapest	339	34
Oslo	370	35	Luxembourg	333	35
Schiphol	364	36	Reading	333	36
Newbury	358	37	San Jose	327	37
Geneve	356	38	Mountain View	322	38
Glasgow	355	39	Copenhagen	314	39
Athens	355	40	Aberdeen	292	40
Boulogne	353	41	Santa Clara	278	41
Rueil	352	42	<b>Den Haag</b>	277	42
San Francisco	344	43	Shanghai	273	43
Newcastle	333	44	Koln	272	44
<b>Utrecht</b>	331	45	Oslo	263	45
Warszawa	329	46	Athens	252	46
Essen	326	47	Torino	245	47
Cambridge	323	48	Hong Kong	245	48
Praha	315	49	Levallois	244	49
Singapore	312	50	Tokyo	239	50
2,494 cities			4,406 cities		

**Table 9:** Ranking list of outward and inward investments (acquirers and targets)

Source Wall, 2010 – based on Zephyr data 2000 - 2009



**Figure 18:** Investments related to Zuidvleugel cities 2000 - 2009.

Source Wall, 2010 – based on Zephyr data 2010

Zuidvleugels most important intercity investments (M&As 2000 - 2009)

Outward investments from Zuidvleugel				Inward investments into Zuidvleugel			
Zuidvleugel as acquiror	Target City	Deal values	Deal values %	Acquiror city	Zuidvleugel as target	Deal values	Deal values %
Zuidvleugel	London	72928806	46,5	Sydney	Zuidvleugel	6394328	11,7
Zuidvleugel	New York	30424619	19,4	Cagliari	Zuidvleugel	5900000	10,8
Zuidvleugel	Tokyo	13542810	8,6	Den Haag	Zuidvleugel	5330723	9,8
				Tokyo	Zuidvleugel	5000000	9,2
				New York	Zuidvleugel	3829599	7,0
				London	Zuidvleugel	3628828	6,7
				Brussels	Zuidvleugel	3310000	6,1
				Rotterdam	Zuidvleugel	2567207	5,7
				Amsterdam	Zuidvleugel	2424800	5,4
				Copenhagen	Zuidvleugel	2300000	5,2
				Houston	Zuidvleugel	2302407	5,2
				Utrecht	Zuidvleugel	2203040	5,1

Connected to 132 independent cities  
 Only 7% of Zuidvleugel's outward investments go to NL  
 93% of Zuidvleugel's outward investments are transnational

Connected to 79 independent cities  
 Only 28% of Zuidvleugel's inward investments come from NL  
 72% of Zuidvleugel's inward investments are transnational

Table 10: Investments related to Zuidvleugel cities 2000 - 2009.

Source Wall, 2010 – based on Zephyr data 2010

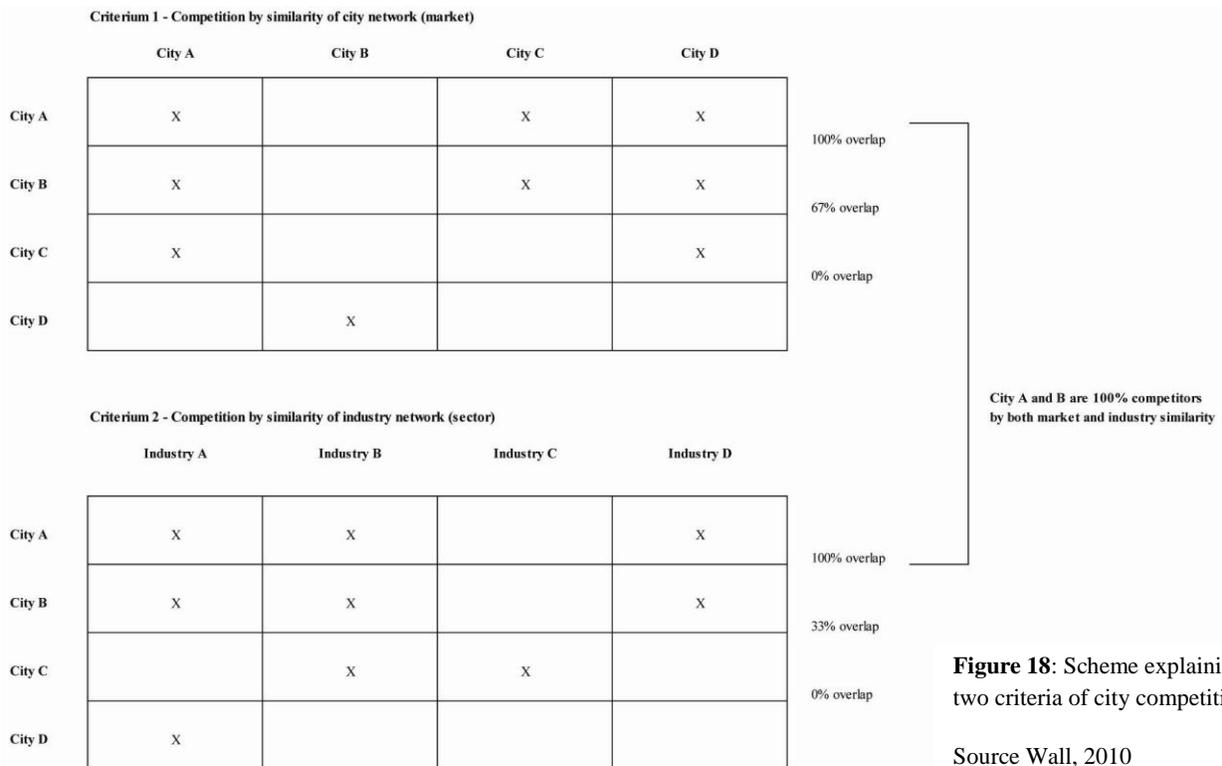


Figure 18: Scheme explaining the two criteria of city competitiveness

Source Wall, 2010

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**Overlap market and sectors**

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Paris
Madrid
London
Roma
Brussels
Zuidvleugel
Amsterdam
Milano
Stockholm
Dublin
Helsinki
Barcelona
Lisboa
Copenhagen
Vienna
Edinburgh
Munchen
Boulogne Billancourt
Athens
Hamburg
Berlin
Manchester
Praha
Reading
Budapest
Alcobendas
Zurich
Frankfurt
Torino
Dusseldorf

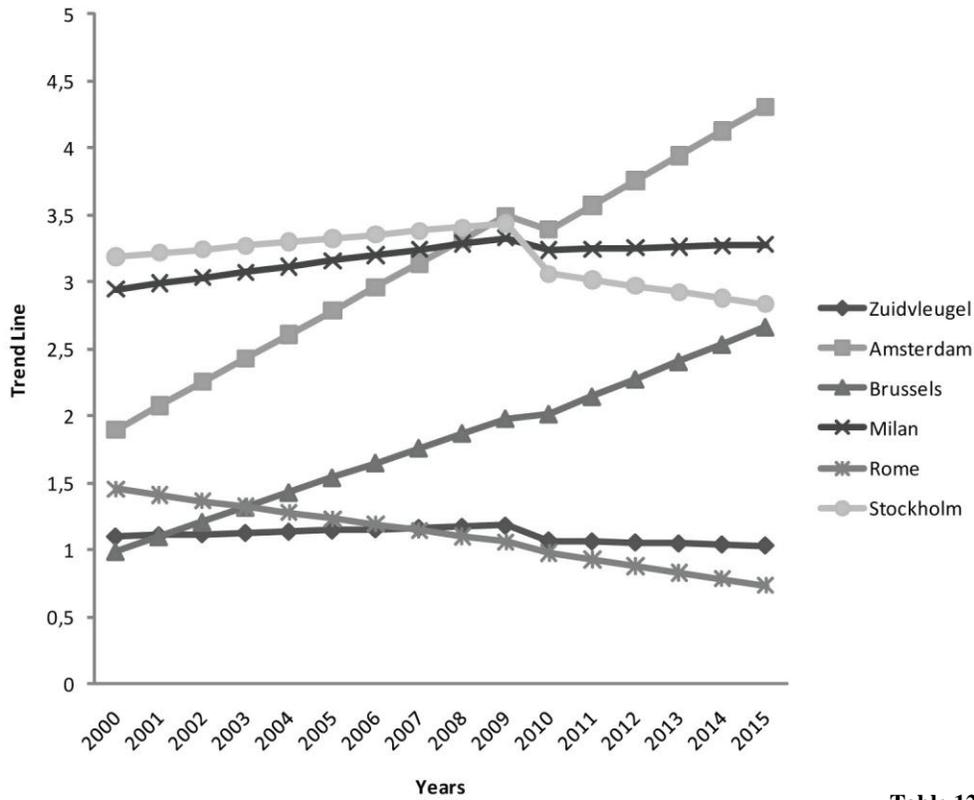
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**Table 11:** The true competitors of the Zuidvleugel.

Source Wall, 2010 – based on Zephyr data 2010



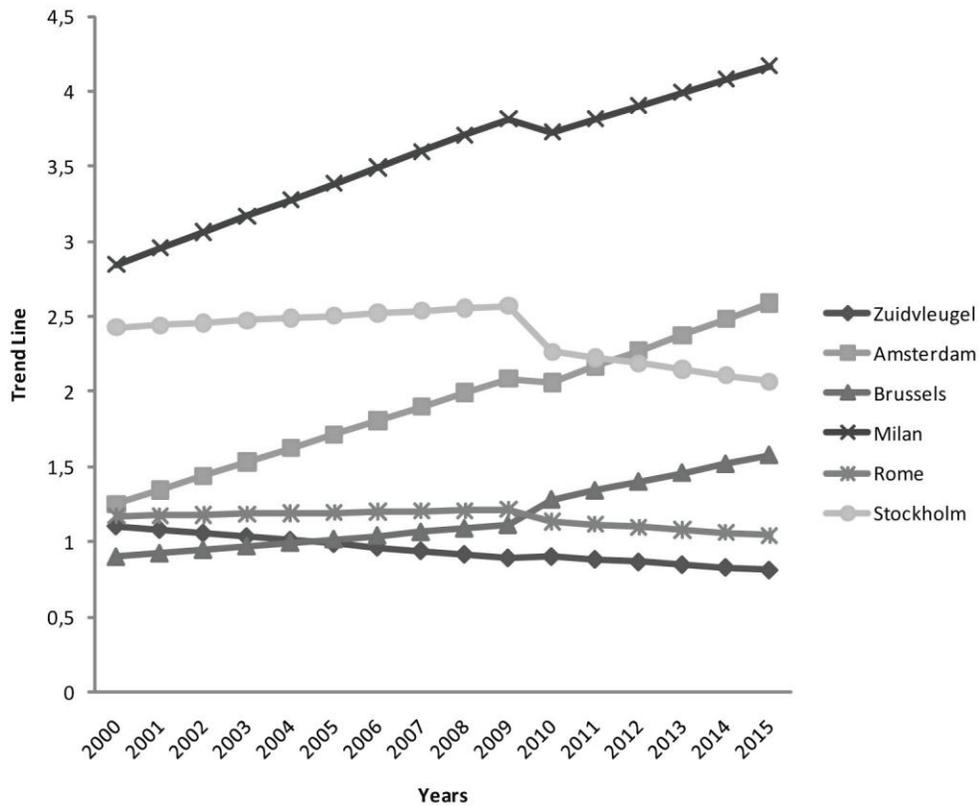
**Forecast of Acquiror Investments of Major Competitive Regions**

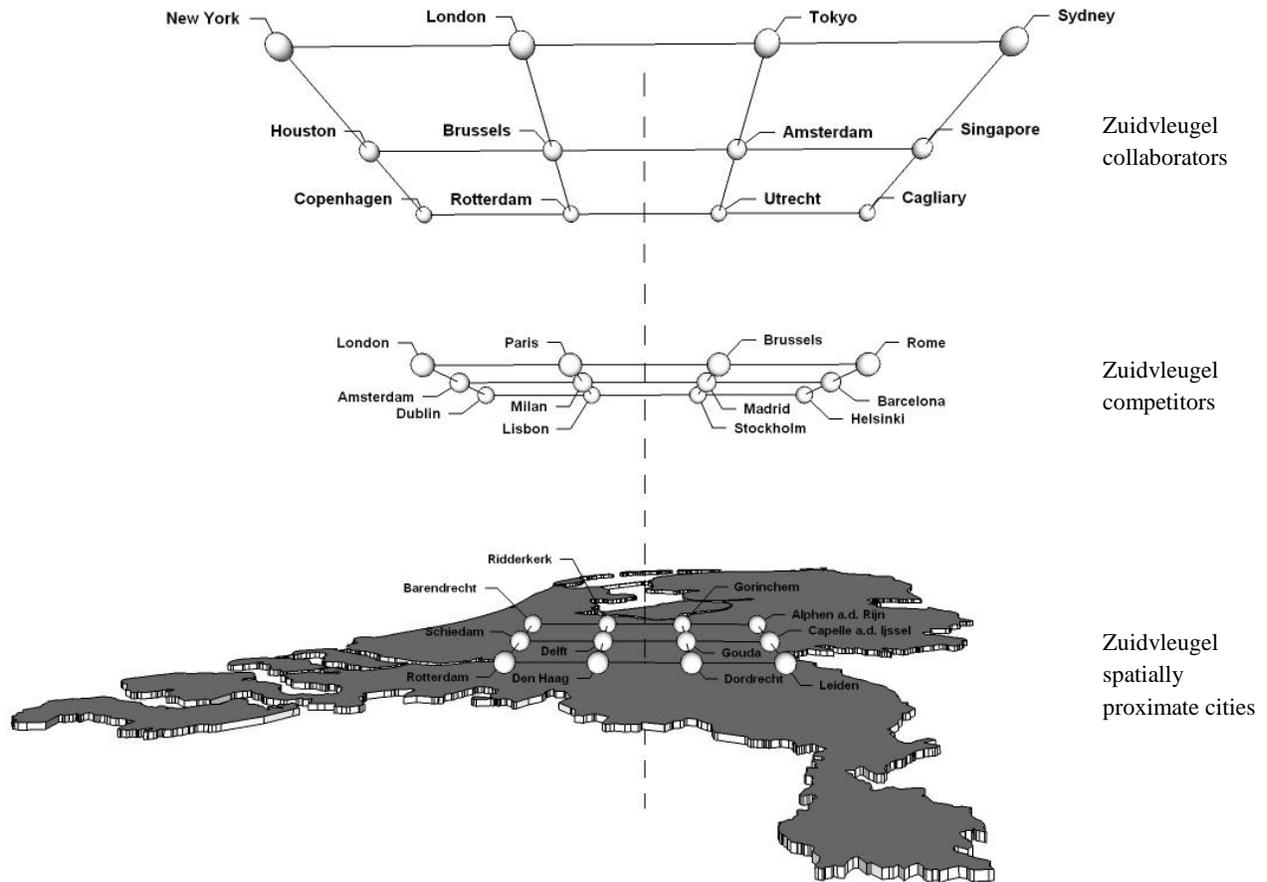


**Table 12:** Forecasts of major competitive regions

Source Wall, 2010

**Forecast of Target Investments of Major Competitive Regions**





**Figure 20:** Planning beyond borders.  
 How to strategically improve the Zuidvleugel spatially so as to improve its economic importance in the world.

Source Wall, 2010

THE HAGUE CITY COMPETITIVENESS

Table A2.261 Basic facts

Basic Facts (Unit)	Numerical Value
Population (10000)	47.21
Area (Sq Km)	98.20
GDP per Capita (\$)	44711
GDP Growth Rate (%)	0.83



Table A2.262 Competitiveness index

Name	Score	Rank	Level	Name	Score	Rank
Comprehensive Competitiveness	0.441	76	A	Z3.4 Status of Talent	1.000	1
Nominal/Real Exchange Rate Ratio	0.021	442	C--	Z3.5 Education Development	0.344	144
GDP	0.036	139	A--	Z3.6 Cost of Labor Force	0.528	119
GDP per Capita	0.712	44	A+	Z4 Hard Environment	0.688	58
GDP per Square Kilometer	0.334	26	A++	Z4.1 Basic Elements	0.708	112
Real Economic Growth Rate (5 Years)	0.138	455	D++	Z4.2 Financial Market	0.641	51
Employment Rate	0.925	223	B	Z4.3 The Ability for Innovation	0.553	55
Labor Productivity	0.627	32	A+	Z4.4 Market Scale	0.446	59
Number of International Patents	0.293	68	A	Z5 Soft Environment	0.774	65
Multinational Corporation Score	0.046	262	B-	Z5.1 Market System	0.563	98
Subentry Competitiveness				Z5.2 Market Regulation	0.724	84
Z1 Enterprise Quality	0.925	8	A++	Z5.3 Social Management	0.900	19
Z1.1 Corporate Culture	0.800	32	A+	Z5.4 Public Service	0.624	51
Z1.2 Corporate System	0.950	8	A++	Z5.5 Strategy and Experience	0.600	88
Z1.3 Enterprise Management	0.867	61	A	Z5.6 Paying Taxes	0.854	21
Z1.4 Enterprise Operation	1.000	1	A++	Z6 Living Environment	0.830	59
Z1.5 Brand	0.900	12	A++	Z6.1 Natural Environment	0.647	105
Z1.6 Enterprise Performance	0.567	62	A-	Z6.2 Environmental Quality	0.934	69
Z2 Industry Structure	0.444	111	A-	Z6.3 Shopping Environment	0.859	23
Z2.1 Manufacturing Development	0.587	107	A-	Z6.4 Dining & Restaurant	0.853	49
Z2.2 Service Industry Development	0.352	126	A--	Z6.5 Housing	0.649	109
Z2.3 Financial Sector Development	0.296	72	A	Z6.6 Culture and Entertainment	0.536	24
Z2.4 High-Tech Industry Development	0.525	50	A+	Z6.7 Social Security	0.641	134
Z3 Human Resource	0.835	10	A++	Z7 Global Connectivity	0.455	84
Z3.1 Health	0.925	67	A	Z7.1 Location Convenience	0.512	84
Z3.2 Literacy Quality	0.837	17	A++	Z7.2 Land Transportation	0.700	99
Z3.3 Status of the Labor Market	0.364	133	A--	Z7.3 Water Transportation	0.139	73
				Z7.4 Air Transportation	0.000	141
				Z7.5 Information Connectivity	0.266	130
				Z7.6 Residents Connectivity	0.552	9
				Z7.7 Enterprises Connectivity	0.291	86

ROTTERDAM CITY COMPETITIVENESS

Table A2.215 Basic facts

Basic Facts (Unit)	Numerical Value
Population (10000)	59.64
Area (Sq Km)	319.35
GDP per Capita (\$)	42027
GDP Growth Rate (%)	0.83



Table A2.216 Competitiveness index

Name	Score	Rank	Level	Name	Score	Rank
Comprehensive Competitiveness	0.428	81	A	Z3.4 Status of Talent	0.491	32
Nominal/Real Exchange Rate Ratio	0.021	442	C--	Z3.5 Education Development	0.358	137
GDP	0.043	119	A-	Z3.6 Cost of Labor Force	0.559	107
GDP per Capita	0.669	74	A	Z4 Hard Environment	0.685	59
GDP per Square Kilometer	0.122	126	A--	Z4.1 Basic Elements	0.709	111
Real Economic Growth Rate (5 Years)	0.138	455	D++	Z4.2 Financial Market	0.641	51
Employment Rate	0.877	368	C	Z4.3 The Ability for Innovation	0.550	56
Labor Productivity	0.652	24	A++	Z4.4 Market Scale	0.436	71
Number of International Patents	0.326	50	A+	Z5 Soft Environment	0.748	77
Multinational Corporation Score	0.116	129	A--	Z5.1 Market System	0.563	98
Subentry Competitiveness				Z5.2 Market Regulation	0.724	84
Z1 Enterprise Quality	0.681	90	A	Z5.3 Social Management	0.700	70
Z1.1 Corporate Culture	0.800	32	A+	Z5.4 Public Service	0.577	67
Z1.2 Corporate System	0.700	78	A	Z5.5 Strategy and Experience	0.700	53
Z1.3 Enterprise Management	0.767	87	A	Z5.6 Paying Taxes	0.854	21
Z1.4 Enterprise Operation	0.709	34	A+	Z6 Living Environment	0.863	26
Z1.5 Brand	0.600	70	A	Z6.1 Natural Environment	0.690	88
Z1.6 Enterprise Performance	0.167	139	A--	Z6.2 Environmental Quality	0.919	80
Z2 Industry Structure	0.477	96	A-	Z6.3 Shopping Environment	0.913	12
Z2.1 Manufacturing Development	0.659	77	A	Z6.4 Dining & Restaurant	0.825	74
Z2.2 Service Industry Development	0.534	72	A	Z6.5 Housing	0.817	18
Z2.3 Financial Sector Development	0.174	131	A--	Z6.6 Culture and Entertainment	0.548	21
Z2.4 High-Tech Industry Development	0.525	50	A+	Z6.7 Social Security	0.611	137
Z3 Human Resource	0.727	89	A	Z7 Global Connectivity	0.757	7
Z3.1 Health	0.946	38	A+	Z7.1 Location Convenience	1.000	1
Z3.2 Literacy Quality	0.780	40	A+	Z7.2 Land Transportation	1.000	1
Z3.3 Status of the Labor Market	0.346	143	A--	Z7.3 Water Transportation	0.815	3
				Z7.4 Air Transportation	0.011	136
				Z7.5 Information Connectivity	0.410	66
				Z7.6 Residents Connectivity	0.581	7
				Z7.7 Enterprises Connectivity	0.277	94

Table 13: Competitive indicators of cities worldwide

Source: Ni and Kresl 2010