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## Money, Technological Diversification and Local Development:

Exemplifying the Role of Financial Capital  
in Munich's Jacobian Cluster context

Abstract

Knowledge and learning are today generally acknowledged as major sources of growth in local development processes. Likewise, it is widely accepted that a functioning regional financial system is crucial for the economic development of firms and regions. Taking the economic history of Munich as an illustrative case, this paper aims to combine these two perspectives and empirically elucidates the connections between flows of capital on the one hand and knowledge externalities on the other. The presented research traces the trajectories of a selection of industries in Munich and discusses the influence that local and non-local banks and other capital providers have had on the evolution of these industries and Munich's industry structure in general. The results indicate that both portfolio investments of the local industry and the increasing influence of foreign financial companies contributed to a differentiation of the regional economy by means of intermediating between various technological paths.

Keywords

Local development, financial sector, knowledge externalities, technological diversification, Munich

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## 1 Introduction

Knowledge, learning and creativity are meanwhile generally seen as crucial factors for the competitiveness of businesses and regions (cf. Lo and Schamp, 2003; Malmberg and Maskell, 2006; Bathelt and Glückler, 2011). The same holds true for a functioning financial and banking system (cf. Martin, 1999; Tickell, 2000; Wray et al., 2010); the political discussions on the ‘systemic’ relevance of banks and the multi-billion ‘rescue umbrella’ announced by the EU during the most recent global financial and economic crisis proved this in a particularly distinct manner. This crisis has however also shown how little we know about the interrelations between the ‘financial economy’ – i. e. all economic agents that provide financial services of one sort or another, such as stock markets, banks, insurance companies, and capital investment companies – on the one hand, and the ‘real economy’ – neoclassical theory applies this term to the part of the economy that is not concerned with buying and selling intangibles on the financial markets, but with actually producing goods and services – on the other hand, and how these two elements are interconnected in developed, industrialized economies.

Within traditional thinking, financial processes are seen as a mere assistance to other processes, which means that the finance industry is only assigned a subordinate role for the smooth functioning of the real economy. According to this view, a functioning financial system enables the efficient allocation of capital to its most productive use, thus contributing to maximise overall wealth. Yet at the latest the scope to which the global financial crisis has turned into a real economy crisis illustrates how problematic this viewpoint is. The severe affection of the the real economy not only means that the financial markets have carried out their original functions in the economic cycle (namely the provision of liquidity, maturity transformation, and the acceptance and distribution of risks) merely in an inadequate manner; rather, it exemplifies the massive extent to which the real economy was – at the “heyday of financialized capitalism” (Hall and Appleyard, 2009) – driven by financial markets, agents, and interests: The transfer and speculation with money often allowed much larger profits than the production and trade of goods and services. As is well known, this distinct focus on the financial side led globally to undesirable developments that have certainly not yet been fully overcome.

The aim of this paper is to shed further light on the two outlined, controversial perspectives of the financial economy and to empirically explore its different roles in the economic development of a particular location. In that way, the paper follows an approach that relates financial relations to the generally recognized importance of knowledge and knowledge transfer for regional development. This is because financial relations are closely linked to the generation, use and transfer of knowledge: On the one hand, decisions about using capital are made based on knowledge about investment options and expected returns, which in general are location-specific. On the other hand, financial flows are closely linked to the creation of new knowledge and the transfer of knowledge between regions. In economic development terms,

this also raises the question of which knowledge creates which impetus in which locations, or what bundles of knowledge and opportunities of knowledge exchange / learning are especially advantageous. In other words, it is a question of whether locations should specialize in a particular area of knowledge to create the desired spill-over effect between businesses in the same sector (Marshall-Arrow-Romer externalities), or is it better to strive for Jacobs' "economies of diversity" and thus a diversified industry structure – a longstanding and up till now intensively debated topic in regional science (cf. Duranton and Puga, 2000; Beaudry and Schiffauerova, 2009; see also Neffke et al., 2011).

Regarding the geographical context of analysis, the research focuses on the Bavarian state capital of Munich. This location displays a pretty diversified economic structure and a high density of knowledge-intensive industries. Accordingly, the brochure entitled "Munich: City of Knowledge" published by the the Munich Department of Economic Affairs and Employment in 2005 names eleven so-called knowledge clusters. Industries such as medical equipment, biotechnology, information and communication technology, environmental technology, the media, and financial services are regarded as "prime movers of the knowledge-intensive urban economy" (LH München, 2005: 4). On basis of empirical observations gained in three recently completed research projects <sup>1</sup>, this paper traces the emergence of a selection of these clusters; in so doing, it illuminates how financial agents – i. e. traditional financial service providers such as banks and insurance companies as well as more recent variations (private equity and venture capital companies, business angels) – and the (non-)availability of financial capital have been associated with the differentiation of Munich's industry structure.

In the overall picture, the findings reveal that financial investments are not only a content-free prerequisite for the development of new technologies, but may also perform a functionality that intermediates between different technological fields and enables new combinations of knowledge. In consequence of this cross-fertilising, an industry or a cluster may mutate into a new one or more over time. By this means, financial agents and relations substantially contribute to the variation and transmigration of established technological paths and thus to the emergence of diversified local economies. The remainder of the paper shows these effects first individually for the financial service sector, the biotechnology industry, and the audiovisual media segment in Munich. This is followed by a synthesis which also includes the genealogies of other industries. Before, the next section consolidates general perspectives on the interplay of financial relations and local development against the backdrop of the challenges of financialization.

1 The work presented provides a synopsis and reevaluation of empirical observations gained during three recently finalized research projects, namely first a comparative investigation on the evolution of biotechnology clusters in Germany; second, research on the service economy in Bavaria; and third, a study on financial relations in the film and television industry in Munich. In all projects, quantitative analysis of secondary data has been combined with qualitative research, including 77 in-depth interviews with entrepreneurs and industry experts (22 in the finance industry, 17 in biotechnology, and 38 in the media sector).

## 2 Financial relations, financialization, and local development

Regional and sectoral developments are subject to a number of influences. Such influences can be grouped into exogenous factors and endogenous factors. Exogenous factors, i. e. those that come from without and can be only indirectly influenced by a region or an industry (for example through lobbying), include most notably the general political framework and infrastructural endowments. Schumpeter's notion of "railroadization", the phenomenon by which US and other agricultural lands were opened up to markets by investments in railroads further basic infrastructure, is very intuitive in this context. Endogenous factors, on the other hand, include cumulative and path-dependent processes (cf. Myrdal, 1957; Hirschman, 1958; Martin, 2006). Regarding this matter, a number of studies following an evolutionary perspective discuss the influence of technical innovations on regional development in general and the formation of clusters in particular (cf. Patton and Kenney, 2010; Garnsey et al., 2010). A second strand of literature addresses the role of financial means and agents in this concern (cf. Avnimech and Teubal, 2008; Zademach, 2009). The following takes both strands into account and attempts to interconnect the two lines of argumentation.

### 2.1 Capital and knowledge as local development parameters

A convincing line of reasoning in evolutionary economic geography regards technological convergence in a context of high absorptive capacities among neighbouring technological fields a decisive key for the emergence of new industries and clusters (Menzel et al., 2010: 6). In this sense, Cooke (2010) illustrates how the cleantech clusters in North Jutland and Wales emerged from related technological areas (in North Jutland the knowledge for constructing wind turbines stems from ship building, and in Wales the knowledge derives from animal feed production and genetic engineering). He sees a prerequisite for the development of new industries in "related variety" (Frenken et al., 2007), i. e. the existence of a spectrum of technological fields that are cognitively not too distant. Hence, Jacobian variety and clusters evolve through new combinations of entrepreneurial and innovative opportunities arising from the mixture of knowledge spillovers from a nearby type of cluster and a rather high absorptive capacity among the neighbouring economic activities (Cooke, 2010: 24).

The examination of the creation of new industries can be meaningfully extended and analytically sharpened by incorporating insights from the increasing body of literature dealing with the exchange of capital in innovation processes. Why is a (functioning) financial system important for innovations and the competitiveness of regions? In developed economies, the financial sector takes on an important intermediary function by compiling the supply of and demand for capital and acting as a broker between surplus and deficit units, i. e. households, businesses, and the state. In the course of this, financial service providers generate profits

by processing information and dealing with risks. That is, information is the raw material for decisions in the financial sector that allows changing uncertainty into calculable risk, and a key output of financial service firms is risk management (cf. Glückler et al., 2008: 87n.; Klagge, 2009). In this process, risks are constructed and monitored in cooperation with other financial service providers, for example in the form of syndicated products or contracts with (re)insurance companies.

A functioning financial system can also open up new sources of knowledge to businesses in a particular location. Numerous concepts see a decisive reason for whether a region can survive in the global knowledge economy in the continuous influx of new knowledge due to networking with international business partners. In this sense, the knowledge-based cluster approach by Bathelt, Malmberg, and Maskell (2004) conceptualizes “global knowledge pipelines” as a decisive source for the growth and competitiveness of successful locations respectively industry clusters. According to this approach, translocal pipelines are the result of strategic partnerships of international scope, which tend to require high levels of investments, i. e. which tie a high amount of capital to a foreign location (cf. Zademach and Haas, 2008: 16n). The availability of and/or access to capital thus signifies a key prerequisite for the access to external sources of knowledge.

The access to capital and transfer of knowledge do however not take place in a simple global/local logic. Both knowledge and capital can be accessed by businesses today in a broad spectrum between local persistence and global availability (Ibert, 2007). Primary reasons for this development can be seen in the global integration of the financial markets in the course of deregulation, the subsequent intensification of competition, and the enormously expanded supply of financial products and services. In conjunction with this development goes an ever increasing pressure on economic results, a pressure that is not only found in business but also generally in large parts of our today’s society – a development which can be seen as a specific outcome of our concurrent global capitalist system, also referred to as ‘financialization’. Using the words of Epstein (2005: 2), financialization signifies a process

“in which financial markets, agents, and objectives take on an ever-increasing role in the sum of economic, cultural, and political activities within and beyond a national economy”.

Financialization thus expresses itself in diverse ways in our daily lives and cultures. In a narrow interpretation financialization reflects the fact that numerous businesses earn a larger portion of their profits by speculating on the financial markets than by producing and trading goods and services (Porsche serves as a prime example). A broader interpretation of financialization refers to the ever-increasing role that financial agents and institutions play in everyday life for all of us. The “financialization of everything” (Leyshon and Thrift, 2007) is expressed not only in the daily stock market news in the evening news, but also in the extent to which e. g. education and training, the health system, or even music and arts, are penetrated by financial agents and motives.

## 2.2 Challenges of financialization

With respect to the interplay between financial relations and the regional/local development being at the core of the present paper, two insights from the financialization debate shall be highlighted and explored further here. The first one refers to the increasing virtue of power of a particular group of new financial actors, the second one to the increasing degree of self-referentiality of the finance industry.

Driven *inter alia* by the comprehensive dissemination of the Internet as well as regulatory developments (in particular the Basel Accords), two new groups of actors could gain remarkable significance in Germany in recent years opposite to the traditional financial service providers, i. e. commercial banks, mutual savings banks (*Genossenschaftsbanken* und *Sparkassen*), and insurance companies. The first group consists of the growing number of direct / online banks and credit institutions, which were established by companies that have formerly not been active in the financial sector (e. g. GE Money Bank, BMW Bank), the second comprises the large variety of institutional investors, i. e. pension funds, hedge funds, or venture capital companies (also called risk capital / private equity companies). The majority of institutions in the last group are of Anglo-American origin. At least some of these companies blatantly coquet with a new, socially little accepted scale of greed for profit: “greed is good”. Withal, these investors use business practices that lack in transparency for outsiders – in an article published in the *Neue Zürcher Zeitung* these investors were accordingly called “new dark men [*die neuen Dunkelmänner*]” (NZZ, 2006), in Germany the term “locust” became well established for this group of financial agents.

In 2007, a record of more than US\$ 680 billion of private equity was invested globally, up over a third on the previous year and more than twice the total invested in 2005 (Private Equity Online, 2008). Private equity firms acquire a controlling or substantial minority interest in a company and then attempt to maximize the value of that investment through different arrangements. In general, they receive a return on their investments through public offerings or the re-selling of their stakes to other (investment) organizations. This implies shifting power relations and modified modes of corporate governance in the target firm. In general, the engagement of financial investors involves a stronger orientation towards shareholder value and return on investment (cf. Froud and Williams, 2007). Common practices with which investors impact on their investment objects include the cutting of costs, job cutbacks, and the disbursement of vast dividends, regularly financed with new debts of the object company. The literature provides a large number of descriptions of the possible negative consequences – as regards the loyalty, motivation, and creativity of the company’s employees, for instance – the influence of equity investors can have on the development of a particular target firm (cf. Pike, 2005; Zademach, 2009).

The second major critique calling the salutary function of our financial systems increasingly into question relates to the degree of self-referentiality in the financial sector, i. e. the observation that the financial industry represents an independent world with own dynamics, values and habits (Engelen et al., 2008). There is broad consensus that the finance industry – this time all groups are meant, including the traditional financial service providers – has recently less and less fulfilled its original function, namely the provision of liquidity for households, the state, and “normal” businesses, i. e. businesses from economic sectors other than the finance sector. Instead, more and more investments have been made within the finance industry itself, which means that banks used the savings of their customers primarily to speculate on their own financial products such as securitized loans or credit default swaps. Ever fewer financial resources have been allocated to the actual primary task of the financial sector, namely efficiently mediating between surplus units and deficit units in the domestic markets, with dire consequences for investment and production activities in the entire economy.

Against this background, the influence of financialization and new financial agents on the coherence, diversity and development of regions becomes more ambiguous than in the traditional understanding of the financial system. Table 1 provides a synopsis of the diverse, sometimes juxtaposed effects that come from the abovementioned new actors in financial markets and these actors’ practices. This compilation makes clear that the association between a local economy’s integration into the global capitalist system and its development performance is less straightforward than both the neoclassical logic and the financialisation criticism might pretend. In this respect it indeed must be acknowledged that, up to a threshold, greater competition, international orientation and efficiency-seeking consequential to the involvement of “new dark men” may even provoke beneficial effects in a particular regional context. This is

Table 1. Financial capital and local development

<b>Mode of finance</b>	<b>Local development consequences</b>
(De-localised) loan finance	Trust-based relations are replaced by market-based relations Break-up of (locked-in) regional networks New marketing strategies of local banks due to greater competition
Risk / Venture capital, Angel investments	Enhanced entrepreneurship Development of new technologies / market niches Intermediation between start-ups and established firms Forced engagement in capital markets
Equity finance	Market structure effects (incl. preservation of suffering companies) Restructuring / efficiency orientation (turnaround investments) Revaluation and recombination of (local) assets Access to global networks

Source: own compilation

especially the case when investors take control of financially stricken businesses in order to save them from going bankrupt. Similarly, venture capitalists and risk capitalists are also specialized in financing businesses that are not served by traditional financial service providers or are only served by them on a very limited basis. By investing in new business in upcoming technological fields, these investors can take on the role of financiers, which are very valuable for both innovation processes and entrepreneurship in a region.

### 2.3 Financial relations and local development

The just mentioned issue of venture financing has already indicated that using an approach that differentiates between the various developmental stages in an economic sector may improve our understanding of the association between financial relations on the one hand and local development on the other. Concerning this matter, the positive effects that the “co-location of science and capital”, i. e. the spatial proximity of (risk) capital and ideas, can have especially on relatively new industries, are rather well established in the literature, for example in studies addressing the biotech industry in the United States (Powell et al., 2002; Owen-Smith and Powell, 2004) or the media industry in Cologne (Mossig 2004a; Glassmann 2008). The term ‘smart money’ often used in this context refers to the fact that the capital made available through venture financing does not merely secure the necessary liquidity but is also accompanied by consultancy services provided by the financier. Martin’s (1999: 11) statement “Money is not just an economic entity ... it is also a social relation” aptly encapsulates this interrelation.

According to a meanwhile well developed body of literature that elaborates on the evolution and distinct development of both industries and local industry clusters (cf. Dosi, 1982; Audretsch and Feldman, 1996; Klepper, 1997; Maskell, 2001; Tichy, 2001, Feldman et al., 2005; Menzel and Fornahl, 2010), the life cycle of industries and industry clusters can be dis-

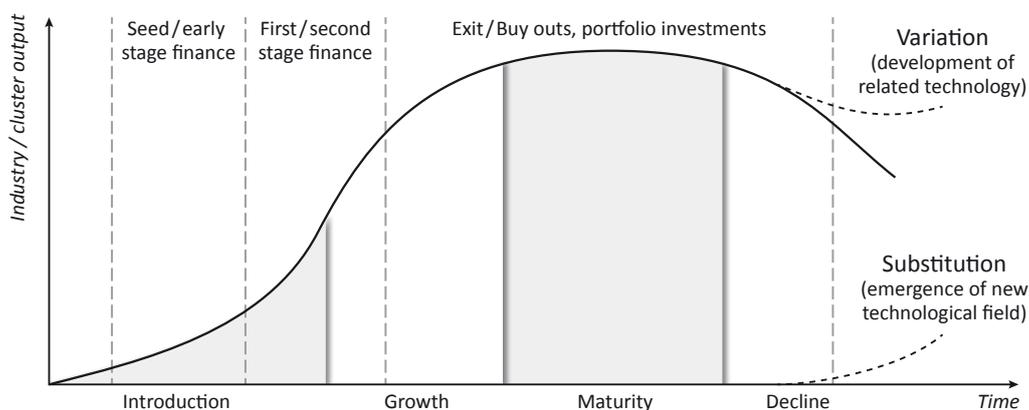


Figure 1. Modes of finance in the life cycle of industries / local industry clusters

Source: own illustration

tinguished into an emergence stage, a growth stage, a sustaining stage or stage of maturity, and a stage of decline (Figure 1). A number of recent studies – among them Klagge and Peter's (2009) work on the private equity industry and Wallisch's (2009) investigation of the networks and investment behaviour of business angels – have shown that businesses tend to rely on different sources of capital during each of these stages of development. As far as generalizations are feasible concerning this matter, the following coherences can regularly be observed in the German context (see also Elsass and Krahn, 2004; Klagge and Zimmermann, 2004):

- In the first stage of development, the emergence stage, private capital stemming from the founder or from private loans (usually coming from relatives) is the primary source of finance. In addition, funding from public sources is used. In technological fields with high growth potentials further means of financing are given, namely through business angels, i. e. wealthy individuals with a corresponding background in the industry, or venture capital / private equity companies. By dint of seed financing, start-up financing, or early-stage financing, these financiers offer special solutions for firms in the developmental stage.
- In the growth phase of an industry, that is after the first businesses in a new technological field have taken off, the need for external capital increases. In the German financial system this need is usually covered by traditional relationship lending through the 'house bank' of the entrepreneurs. On the other hand, high growth companies represent particular attractive objects for private equity / venture capital firms (first-stage and second-stage financing). These firms acquire a controlling or substantial minority position in a company with the intention to maximize the value of that investment.
- After a certain time span, typically five to seven years, investment companies aim to sell or 'exit' their interests in portfolio companies again for a price that exceeds the price paid. Common exit routes for investments that are not write-offs historically have been an Initial Public Offering (IPO) of the portfolio company, i. e. the shares of the company were offered to the public, or a sale of the company to a strategic acquirer through a merger or acquisition (trade sale). Increasingly, more common has been a sale of the portfolio company to another private equity firm (secondary sale). In the course of such a change of ownership the portfolio company is often substantially restructured by the new owner, which is why this route is referred to as turnaround investment, too (see also Figure 1, again). Another exit strategy is a preferred dividend by the portfolio company to the investment company to repay the capital investment, either financed from the cash flow generated by the company or with additional debt (recapitalization).

The provision of larger amounts of capital is meanwhile regularly arranged in the form of syndications; since the Euro was launched in 1999, the syndicated loan market has become the dominant way for European issuers to tap banks and other institutional capital providers for loans<sup>2</sup>. A syndicated loan is one that is provided by a group of lenders – banks, finance companies, hedge funds, and institutional investors – and is structured, arranged, and administered by one or several commercial or investment banks known as arrangers (Caouette and Altman, 1998; Taylor and Sansone, 2007). That is, a minimum of two parties come together to share the profits, costs and risks for the provision of capital. Working out a syndicated financial solution requires repeated personal interaction and exchange of information between the varying parties involved.<sup>3</sup> Not infrequently, the close cooperation during the syndication process leads to particular trustful relations between the investment capital providers and further joint investments in the same or related growth fields.

Finally, both investment firms and companies which were able to build up a respective capital stock after successful growth aim to optimize their investment management following a diversification strategy. With portfolio investments, companies aim to broaden their fields of activity and thus to limit their risks related to the distinct economic cycles of individual markets. For this purpose, the companies use and combine experiences and knowledge about different technological fields. As the here presented case study of Munich exemplifies, portfolio investments signify a further potent driving force for the creation of new growth areas.

In locations characterized by a diversified industry structure, companies and investment firms have a large variety of different local and trans-local opportunities for investment, syndication and diversification. Concerning this matter, it has to be taken into account that regional growth paths are embedded hybrids, wherein parts of the system adapt to new situations and other parts persist. Change in these systems can occur when paths collide – not necessarily violently – such as with the translation of foreign production or financing methods into the local systems, or when local firms break new grounds in new fields of activity and thus approach new partners (Gertler, 2004). That is, local development is not a one-dimensional process, but marked by the concurrent presence of a broad spectrum of diverse, overlapping corporate

2 Historically, banks have dominated the European debt markets because of the intrinsically regional nature of the arena. Regional banks have traditionally funded local and regional enterprises because they are familiar with regional issuers and can fund in the local currency. Since the Eurozone was formed in 1998, the growth of the European loan market has been fuelled by the efficiency provided by this single currency as well as an overall growth in mergers and acquisitions, particularly leveraged buyouts due to private equity activity (Standard & Poors, 2010: 7n). As a result, more and more leveraged buyouts have occurred over the past few years and a broader array of banks from multiple regions now funds these deals, along with European institutional investors as well as U. S. institutional investors.

3 The syndication process includes the preparation of an information memo describing the terms of the transactions, on which's basis the syndicate desk will solicit feedback from potential investors, a number of meetings at which potential lenders hear the management, and, once the loan is closed, the documentation of the final terms in a detailed agreement.

developments and investment options and relations. To account for this overlapping and concomitance in a multi-trajectory perspective serves as starting point for the empirical observations presented now.

### **3 Empirical observations from Munich**

The following section first elaborates on the development of the financial sector, the biotech industry, and the audiovisual media industry in Munich individually. In so doing, the section illuminates in which manner and at which points in time financial relations in general and the practices of specific financial actors in particular have contributed to the development of new technological fields and thus to diversify Munich's overall economic structure. After that, a synthesis is presented in which the genealogies of further industries important to Munich's today economy are taken into consideration, too.

#### **3.1 The development of the financial sector in Munich**

Munich is not a traditional financial center dominated by banks. This can already be seen by measuring the atypical architecture of Munich, with its decisive lack of banking skyscrapers that can be seen for miles, with that of other financial capitals, especially Frankfurt. Indeed, Munich is often not even mentioned when listing Europe's most important financial centers today (cf. Karremann, 2009). The reasons for this lie in Munich's historical development, as the city's rise to prominence in the financial world did not begin until relatively late in history. From the Middle Ages until the 18th century, Munich played only a subordinate economic role in Bavaria, with the imperial cities Augsburg, Nuremberg and Regensburg being the stronger (financial) centres. Accordingly, the first stock market in Bavaria was created in 1540 in Augsburg, the same year in which Nuremberg opened a stock exchange.<sup>4</sup>

The meagre financial services that did exist in Munich at this time served predominantly the royal court's needs. Thus, internal self-financing dominated in the city until the middle of the 19th century (Wagner-Brown, 2007): Small businessmen, especially craftsmen, largely expanded their traditional businesses and workshops into industrial factories by using profits generated from their own businesses. External financing was largely limited to loans from relatives and friends or microloans (Graff, 2000). It was not until private banks were founded in the second half of the century (e. g. *Bankhaus Merck Finck & Co*, founded in 1870) that external financing possibilities became a viable option:

4 The Bavarian Stock Exchange headquartered in Munich emerged only in 1935, resulting from a merger of the stock markets in Munich and Augsburg.

“What private banks used to do back then is now referred to as private equity. In that days, bankers acquired an interest in a young company, that is they provided capital being personal liable. That’s what they did: they offered companies entrepreneurial knowledge and capital – and it was a successful story” (Interview with branch manager of a private bank, Sept. 2009).

Hence, private banks played an essential role in supporting industrialisation in Munich in the late 19th century. Also, the significance of the mortgage business with house owners and commercial enterprises rose continuously (Jungmann-Stadler, 1988). In particular the expansion of house building was positively associated with the increasing relevance of mortgages. The growth of banking in Munich thus displayed a strong local nexus. Commercial banks like the *Vereinsbank* focused their business activity on the financing of the growing Munich industry, allowing their loan business to grow rapidly. Others specialised in the private customer business. Generally speaking, commercial banks took over the financing of industry and housing, while the national savings bank Sparkasse and the cooperative *Volks- und Raiffeisenbanken* were responsible for the broad public (Wagner-Braun, 2007: 87).

In the post-war period, Munich gained significance as location for high technology growth sectors such as microelectronics, the aerospace industry or biotechnology. In the view of the state government, a distinct science orientation was regarded as a key element in the economic modernisation of Bavaria (Deutinger, 2001; Haas, 1991). Politicians were aware of the significance of an adequate technical and financial infrastructure and thus promoted measures which increased the attractiveness of the region for financial institutions. This special relationship between economy and policy is also referred to as “Isar capitalism” (LfA Förderbank Bayern, 2001: 69); typical for this were the relocation of large German industrial enterprises and insurance companies to Munich. For example, in 1954 *Allianz* moved from Berlin to Munich. A major reason for this relocation was the long-established close relation between *Allianz* and the insurance company *Münchener Rück*.<sup>5</sup> Both the formation of Munich as a strong insurance center and Frankfurt as the national banking center is thus to be seen against the background of the political turmoil after World War II.

Seen in the whole, the developments in Munich till the end of the 1960s display a clear mutual connection between the economic growth in the region and the development of the local financial sector: Initially, the presence of the first banks was a locational advantage of the quickly growing city. Later, the dynamic economy created new impetuses to the financial industry by demanding increasingly diversified financial services. In other words, the local

5 Similar reasons led to the relocation of banks to Frankfurt: The economic council of the American and British occupation zones was located in Frankfurt, thus important decision makers came to the city. These influenced the settlement of the banks. The foundation of *Kreditanstalt für Wiederaufbau* KfW and *Bank Deutscher Länder* served as an initial nucleus for the development of the banking sector (Holtfrerich, 1999; Grote, 2008).

banks saw themselves as a partner of the regional economy and adapted themselves to the increasingly complex needs of their customers.

This coherence was blurred during the 1970s: With the end of the Bretton Woods system of fixed exchange rates, it became increasingly necessary to hedge the risk of foreign exchanges by means of futures and forwards. In consequence, further derivative financial products were developed; asset-backed forms of financing became established as an alternative to classic credit finance. At the same time, the oil crisis led to a decline in the domestic loan business. To be able to continue on a growth course and to reduce the dependence on the local economy, banks were forced to expand abroad. Private business banks, especially, reduced the number of loans they gave in Bavaria because of this. At the same time, the number of loans offered by foreign banks skyrocketed (LZB, 2001), and Munich could – as the following two industry studies will exemplify in more detail – establish itself as Germany's premier location for venture and risk capital (Zademach and Haas, 2008; Klagge and Peter, 2009).

### **3.2 The development of the biotech industry in Munich**

In comparison to Munich's somewhat slow rise as a financial center, the city's development into a center for biotechnology can be seen representative for the success of this economic sector over the last twenty years in Germany as a whole. The bulk of Munich based firms affiliated with the biotech industry are located in the southern suburb Martinsried. The origins of this cluster date back to the first half of the 1970s when the Max Planck Society combined three research institutes into a single center for bioscience and the university hospital in neighboring commune Großhadern opened. This concentration of research institutions and medical expertise attracted the Max Planck Institute for neurobiology, an institution that studies genes and genetics, which opened its doors in Munich in 1984; it also led to the replacement of the departments for chemistry, pharmacology, and biology of the Ludwig-Maximilians-University to Martinsried. In the meantime, more than 50 small and medium sized companies and research institutions are concentrated in this location. Nearly half of them are specialized in creating and developing therapeutic and diagnostic products for the medical industry. Besides, the location is home to producers of biotech products and reagents as well as institutions dealing with DNA and protein.

As elaborated by Häußler and Zademach (2007), Berlin and Munich experienced the greatest growth (measured in terms of number of corporations) among all biotech clusters in Germany since 1996, the year in which the German Federal Ministry for Education and Research (BMBF) recognized locations in the publicly advertised BioRegion competition. In the first instance, the dynamic development of the biotech industry in Munich is based on the impetus of the public authorities. Indeed, according to the database of the BMBF, development funds amounting

to € 24.4 million went to Munich until 2003, more than one-third of all money granted by the German Federation to private biotech enterprises; this sum is added by the means granted to research establishments and to state-based or semi-state-based institutions.

In this context, interviewed experts emphasize the Max Planck Innovation GmbH MPI (more than 80% of the Max Planck Society's budget stems from federal funds and the *Länder*) as best practice model: This institution is responsible for the technology transfer between the concurrent 78 basic research centers located across the whole of Germany, including the Max Planck Institute for Biotechnology and Neurobiology in Martinsried. With the ultimate aim to ensure the meaningful use of public monies, the MPI appraises the research findings brought forward in the various Max Planck institutions in terms of their commercial viability in a process referred to as *scouting*<sup>6</sup>; in this process, a board of advisors consisting of international experts appraises basic research results in terms of their commercial viability and provides support to transform the findings into applicable and marketable services.

Similarly, already in 1997, i. e. directly after Munich's successful participation in the BioRegion competition, the BioM AG was founded, an organization that aims to connect the agents active in the biotechnology industry among each other. This institution (renamed BioM Biotech Cluster Development GmbH in 2006) not only offers the organization of lectures of invited guest speakers, regular meetings, and crash courses to gain basic knowledge in business administration, for instance, but also serves as a contact point for parties looking for qualified collaborators or for answers to questions about Munich as biotech location. In addition, BioM acts as a mediator between biotech companies and external providers of capital. Due to the high risk involved in the commercialization of biotech research results, internal finance based on equity and mezzanine capital is distinctly more prevalent than debt financing in the industry.

According to pertinent sources<sup>7</sup> biotech companies in Munich reported investments of € 1.17 billion between 1996 and 2003. This figure corresponds to 54% of the total investments made in the nine most important biotech industry locations in Germany, or 49% if measured in terms of the number of transactions made during this period (Häussler and Zademach, 2007: 272). Thus, the number and amount of investments are three to five times higher than in other leading German biotech locations (apart from Berlin, as already mentioned, these are the Ruhr region and the Rhein-Main region); and compared to public funding, the sum of

6 If the scouting procedure turns out successful, returns generated by licensing fees are divided equally among the Max Planck Society, the institute responsible for the innovation, and the inventor.

7 The main source for this investigation is a compilation of the annual BioCom listing of biotechnology firms, public institutes that perform biotechnology research, and investors in biotechnology. BioCom is the largest and most historical independently operating directory for biotechnology in Germany. This dataset was completed and supplemented by information from industry-related magazines, other databases and press releases.

investments made by private investors exceeds the amount of money stemming from federal funds even by a factor of almost fifty.

In sum, the emergence of the biotechnology industry in Munich provides a stark illustration of the close connection between state initiatives and developmental processes supported by financial investors. Yet it has to be kept in mind that investments in this location fell on a particularly fertile ground: As discussed in more detail elsewhere (see Zademach and Rimkus, 2009: 425n), the rise of Munich's biotech cluster would not have been possible without the existence of a broad and differentiated seedbed of technological skills and capacities in the local labor pool prior and during the take-off of the industry. These skills could have gained in related technological fields, signified for instance by comparable demands as regards the employment qualifications. Among these are the food industry, fine mechanics, and medical technologies; in all of them Munich hosted and in part still hosts a number of internationally competitive firms (compare also section 4 below). In other words, the skills and capacities gained in the related technological fields represented the key prerequisite for the development of the industry. On this basis, innovative products and marketing ideas could have been developed which in turn attracted investors and forced their commitment in Munich's growing biotechnology industry.

### **3.3 The development of the film and television industry in Munich**

In Munich's development into one of Germany's media capitals (next to Hamburg, Cologne, and Berlin), state intervention, again, has to be looked on as initial key driving force. The city is today an important location for print media; indeed, after New York, the second most important place for the publishing industry. Beside, it has a long tradition in the production of audiovisual media, a segment which conveys the meanwhile dominant influence of the financial economy in particular obvious manner.

The first movie studios were founded in Geiseltasteig in the southern part of Munich in the 1920s. These studios largely survived World War II unscathed, so that independent movies could be produced again already in 1949, which contributed to the early development of specialized knowhow in Munich. In addition, Munich's development to a premier media location is strongly connected to the public service broadcasters: In 1950, *Bayerischer Rundfunk* was established as one of nine regional TV stations in the federal structure of the ARD, the cooperative association of public broadcasters in Germany. As licensing fees are allocated according to the population of the Länder – Bavaria is Germany's second most populous province – and regional broadcasters are, in return, obliged to respectively contribute to the common program of ARD, Bavaria was able to develop a comparatively strong infrastructure for TV production at an early stage (Mossig, 2004b).

The establishment of a regional studio of ZDF, another German public broadcasting company, in the 1960s gave further impetus to the growth of the audiovisual media industry in Munich. As this broadcaster received a lower degree of public funding, ZDF was forced to adopt a less integrated strategy than Bayerischer Rundfunk and focused heavily on granting commissioned productions to freelance producers. This also laid the foundation for the rise of Leo Kirch, a media entrepreneur, who subsequently should play an outstanding role in shaping the media landscape of Munich and especially the northern suburb Unterföhring. At the end of the 1950s Kirch entered into the intermediary trade with movies and movie rights and founded a number of distribution companies in Munich. His main clients were initially ARD and later and to a greater degree ZDF. Due to his good connections with Hollywood studios, Kirch was able to expand his movie library and to meet the growing demand for motion pictures of these two broadcasters. Apart from the movie rights trade, Kirch also entered into the (co-)production business to secure for himself the German rights to international movies and television series at an early stage (Gehring, 2003). By this means, Kirch rose to become the predominant program provider for public broadcasting corporations in Germany.

The liberalisation of the national TV market in the 1980s and the entry of new players released new market opportunities for Kirch. In order to secure his trade channels, he early took shares in the new market participants and integrated further levels of the value chain into his corporate group. He was one of the three founders of the Sat.1 channel in Berlin, and via his son Thomas Kirch established ProSieben in Munich, followed in the 1990s by Kabel1 (initially Der Kabelkanal, from 2005 onwards kabel eins), and the sports channel DSF. Kirch also forced his way into the pay-TV sector by means of a shareholding in Premiere as sole supplier in this segment of the market. At that time, too, movie and television industry was patronized by policymakers, as the Bavarian state government under Franz-Josef Strauß recognized the growth potential of this industry and created a corresponding support system for it, for example by establishing the FilmFernsehFonds Bayern (a fund especially set up for movie and television productions in Bavaria), a number of movie awards, and later the cluster audiovisual media in Bavaria's cluster strategy. As is well known and documented in the literature (e. g. Bathelt and Gräf, 2008), the rise of the Kirch Group to one of the largest media imperiums worldwide – in its heyday the group employed close to 9.500 staff in 150 business units and was valued at € 5.6 billion – was followed in 2002 by the biggest bankruptcy in German history<sup>8</sup>, with dire consequences for the entire industry.

8 The causes of the Kirch Group's bankruptcy largely lie in its high level of debt. The Group's expansion strategy called for an enormous amount of capital, which could not be covered by day-to-day operations and thus had to be covered by loans. In particular the involvement in pay-TV turned out to be exceedingly costly.

As a number of banks, which experienced high losses after the Kirch Group went bankrupt, withdrew entirely from the movie and television industry, the Kirch crisis resulted in drastic changes of the practices of finance in the media market throughout the whole of Germany. Among these changes is first of all the immense influence of (foreign) financial investors. Probably the most prominent example illustrating this trend is the engagement of Haim Saban, a strategic American investor, who acquired part of the former Kirch Group, which he then divested to KKR and Permira, two private equity companies in 2006. Further investment companies that took shares of Munich based media firms are Providence Equity, 3i, Wellington, or the Canadian pension fund OTPP. Although the number of media companies under foreign control still accounts for only a smaller percentage of the total in absolute terms (IHK, 2007: 21), when measured in terms of the local workforce employed by the acquired companies, the influence of these financial investors has reached a significant level. Besides, former managers in the Kirch Group used the fortunes they had accumulated during the company's boom years and their expertise in the field to act as 'angel' investors and support creative projects in the technology-intensive branch of the industry

The increasing presence and influence of foreign investors has resulted in a stronger international orientation and a strengthening of external linkages of the entire media industry in Munich. Expressions of this are the implementation of English as the corporate language in numerous, also smaller production firms; the introduction of new management techniques and reporting systems; a remarkable rise in the number of coproduced and cofinanced projects with international partners; and a greater openness towards equity financing in particular in the younger generation of filmmakers and entrepreneurs. Today, Munich is seen as the leading German location for this technology-oriented part of the media industry, i. e. the segments related to IP-TV and computer and video games. Not least, this renewal and the regained strength of the industry encouraged local banks to re-engage in the audiovisual sector, with new products and solutions. One of the new services they offer is the so-called 'Patronatsmodel'<sup>9</sup>, in which banks do not only act as intermediaries for capital but also arrange business partnerships.

#### **4 Synthesis and sketch of an industrial genealogy for Munich**

The executed observations on the finance service sector, the biotechnology industry, and the media economy in Munich have revealed the various roles that the actors and practices of the

9 In this model, banks – driven by the incentive to serve potential future customers – provide free-of-charge advisory services including the offer to introduce young producers, such as the graduates from Munich's University for Television and Film HFF, to more established, financially sound production companies. In the event of a successful introduction, producers can develop their project ideas as junior partners, in return for either a fee or shares in the company.

finance industry and their relations with manufacturing companies and service providers from other economic sectors can play. At first, the development of Munich into a financial center, whose main focus today is on the insurance industry and ventural capital, has made clear the close interconnection between regional economic growth and the strengthening of the local financial sector. As shown, this correspondence experienced an intermediary rupture; today, however, there are strong indications for a renewal of this distinctive coherence. As can be seen from the reflections on Munich's financial service sector alone as well as by looking at the other two industry case studies, this renewed approximation is closely related to the increased importance and acceptance of equity and other cooperative modes of finance – as the observed models of scouting, patronage and syndicated finance – that require a vital degree of knowledge transfer and sharing.

Moreover, the case of the biotechnology industry illustrates the large extent to which the intentions of governmental authorities are superimposed on by the activities of financial service providers. In the case of Munich, the balance of power between the financial sector and the state turned out to be advantageous for the emergence of this new technological field. However, also constellations working the opposite direction are perfectly conceivable, so that the sign of the resultant force cannot be foreseen unambiguously (as can be seen in the current attempts to re-regulate the finance industry, too), but are always highly context-specific. Accordingly, the development of Munich's film and television industry encompasses periods in which the actions of the finance industry were in accordance with the political intent, but it also shows phases of dissonance, for example when the Kirch Group went bankrupt. Despite the fact that governmental representatives worked hard to counter the effects of this disaster, the "German solution" they sought could not be realized in the end. Then, in the subsequent crisis phase, it chiefly was the new agents in the finance industry who filled the void and in consequence contributed to the renewal of the cluster. The breaking up and reconfiguration of formerly locked-in networks allowing space for new business ideas and marketing strategies is thus a further characteristic of the interplay between regional industry development and financial agents respectively their investments. That is, by disrupting prior trajectories and setting up new local and trans-local connections, financial relations drive new junctions in the bundle of overlapping intra- and intersectoral corporate paths that typify the multi-dimensional process of regional development.

Against this background, Munich's economic landscape reveals a number of moments in which corporate connections based on loan or equity finance were the decisive landmarks for new development paths respectively market opportunities. The following selection of corporate histories might illustrate this point. Besides, Figure 2 outlines a genealogy of important industries in Munich based on these histories (highlighted in the figure by dint of the respective letters) and further research into this places's economic past.

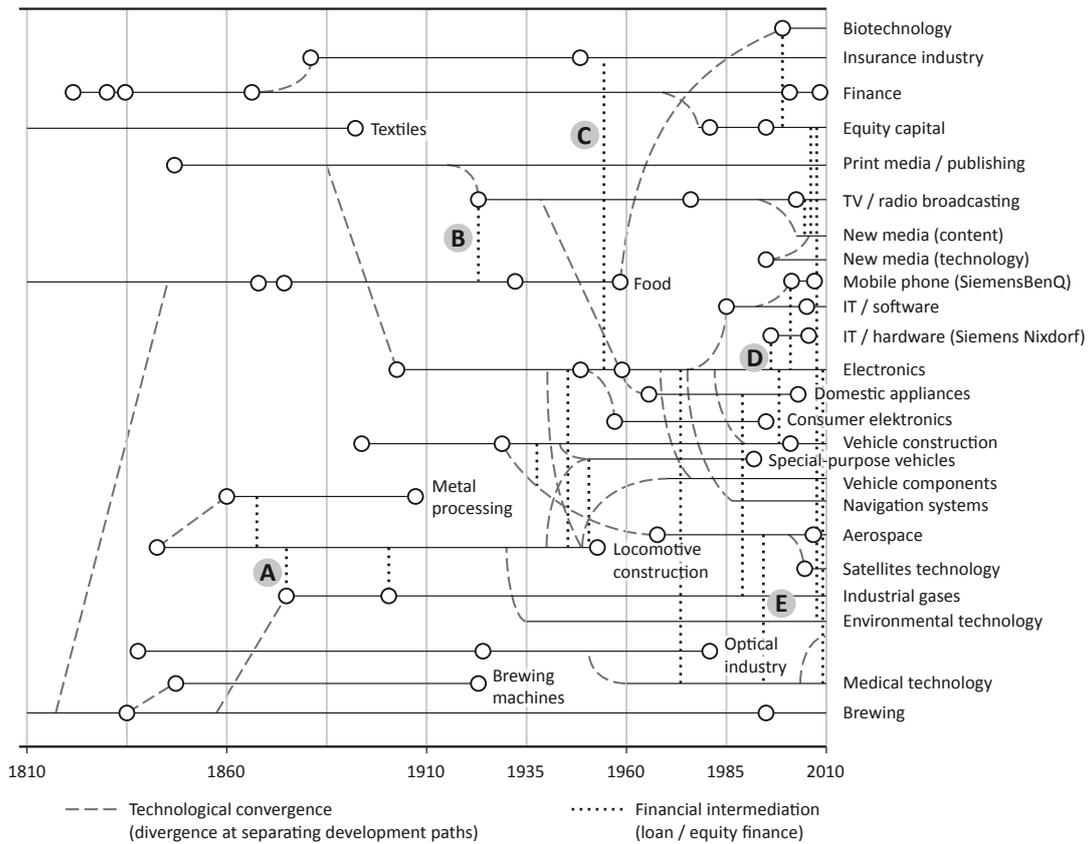


Figure 2. Genealogy of leading industries in Munich's economic history

Source: own illustration

- A: Linde AG, the leading producer of industrial gas, has its roots in 'Linde's Ice Machine Company (*Gesellschaft für Lindes Eismaschinen Aktiengesellschaft*). This corporation was founded by Carl von Linde in 1879 in order to satisfy the demand from the brewery industry. The majority of capital for the foundation stemmed from Georg Ritter Krauss who accumulated his fortune with Krauss-Lokomotiven, a rail car production company.
- B: The Bavarian broadcasting company Bayerischer Rundfunk was born out of the company *Deutsche Stunde in Bayern Gesellschaft für drahtlose Belehrung und Unterhaltung* (English approximation: German hour in Bavaria corporation for wireless education and entertainment) founded in 1922. One of the company's founders and financers was Robert Riemerschmid, who invented the herb liqueur "Escorial" in 1910 and led the Riemerschmid Group, which produced brandy, cordial, and vinegar on Munich's Prater Island (today part of the Underberg Group).

- C: The expansion and diversification of Siemens AG in post-war period was largely backed by Allianz and Münchener Rück. For years both insurance companies belonged to the main shareholders of Siemens AG, which is present in more than 190 countries today. Siemens moved its headquarters from Berlin to Munich and Erlangen in 1949. In the 1950s Siemens began dataprocessing and producing semiconductors, which is also the period in which their consumer products (household appliances) and medical equipment (heart pacemakers) divisions were expanded.
- D: With the objective to remain competitive in dataprocessing, Siemens bought a majority share in Nixdorf Computer AG (Paderborn) in 1990; all research and development activities were moved to Munich. In 1999 Siemens split off Siemens Nixdorf Informationssysteme AG that had resulted from the acquisition (operating today under the name Wincor Nixdorf International AG). Only the personal computer division was integrated into Fujitsu Siemens Computer GmbH.
- E: A milestone in Munich's medical engineering industry is a device that breaks up kidney stones and was developed with the help of Dornier, an aircraft manufacturer, in the 1970s. This device works with bundled soundwaves in a process called extracorporeal shock wave lithotripsy, a revolutionary process in the destruction of kidney stones. It was first used in the hospital in Großhadern in 1980. Dornier created its own business segment with this device at its former location Oberpfaffenhofen in Munich's south-western urban fringe.

These examples illuminate the extent to which capital from local businesses and financial service providers contributed to opening up new technological fields and thus also to diversifying Munich's economy. Throughout the course of history, individual industries that had once been profiling Munich's economic shape either lost their importance or disappeared in total. Among these is, for example, the foundry industry, which once blossomed in the wake of the locomotive building boom and was carried out by a considerable range of producers, such as Krauss, Maffei and a number of further larger manufacturers. One example of this is the company Kustermann, which once had a factory spanning numerous hectares for its iron foundry; today the property is home to an office complex. In addition, the food industry (Pfanni, Kathreiner), the optical industry (Agfa, Rodenstock), or, more recently, the production of mobile electronic devices (Siemens, today BenQ) have also lost their former importance as big employers. Similar to the cases of the media and biotechnology industries discussed in greater detail above, the optical industry discloses numerous further indications for the tremendous effects of equity capital during the restructuring of an industry (in essence, only the medical equipment segment has survived the recent engagement of financial investors).

In the overall picture, investments made by businesses and financial intermediaries in the history of Munich's economy were regularly in close connection to technical innovations. Overlaid by political dynamics, they substantially contributed to the advancement of new technologies. Thus, financial processes accomplish markedly more than merely serving as assistants, the role they are said to have according to the traditional viewpoints presented earlier: In the case of Munich, the capital and involvement of local businesses have, in combination with the related transfer of knowledge and learning processes, continuously been a central key for the fact that both formerly prosperous industries that were declining or had disappeared could have been substituted, and repeatedly new growth fields could emerge that are still important today.

## 5 Conclusion

The aim of the paper was to exemplify the diverse roles of financial institutions and investment relations in the context of local economic development against the backdrop of controversial viewpoints of the finance industry. For this purpose, it followed a multi-trajectory approach that relates financial relations to knowledge and knowledge transfer and empirically traced the interrelations of various modes of finance during the life cycles of industries and industry clusters respectively with intra- and inter-sectoral learning processes.

At first, the collected observations signify the extent to which the evolution of industry sectors and their locations is generally to be seen as the result of a process in which technological paths, political conditions with varying signs, and the possibilities and limitations related to the availability of financial means respectively the influence of shareholders overlap. More specifically, the research has shown that financial relations are of particular importance for the development of an industry primarily in two developmental stages, namely during the period of growth, as seen in the case of the biotech industry, and in the phase of restructuring following maturity, as was shown in more detail in the film and television industry and in outlines in the optical industry. In addition, the findings have revealed the key roles cognitive proximity and exchange of know-how play in investment decisions and financial relations. In this context, new market opportunities for businesses and investors may emerge from the convergence of technological developments (as in the case of shock wave therapy used for kidney stones). Munich's history, however, shows a particularly high number of investments in diverging paths, for example between the food industry, precision engineering, and biotechnology, or between the audiovisual media industry and the growing games sector.<sup>10</sup>

<sup>10</sup> Other examples, which are not discussed in any detail here, can be found in areas relating to the production of motorcycles and motor vehicles, both rooting in aircraft engine production, or between solar energy and electrical engineering.

By this manner, local businesses, wealthy individuals, and financial institutions in the early stage, and later also foreign investors, have repeatedly developed new growth areas and continually renewed and restructured Munich's industrial landscape. In light of this, financial relations can be regarded a central force in the intermediation between technologies and knowledge within and between industries, and thus as a key engine for the diversification of local economies. As exemplified, these relations leave traces – traces that presumably allow more insights into the complex interdependencies and temporalities of local development processes, thus worth to be further followed.

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