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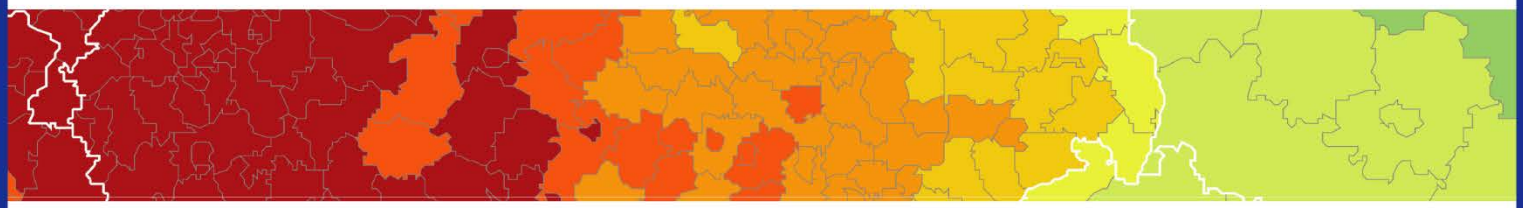

MISTA
Metropolitan Industrial Spatial Strategies & Economic Sprawl

Targeted Analysis

Annex 3.1
Case study report: Berlin (DE)

Annex 3.1 – Case study report: Berlin (DE)

This targeted analysis activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

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Executive summary

In the three decades since Germany's unification, Berlin has been at the centre of a larger national reckoning of how to bridge two planning and economic systems. The early 2000's, mayor Klaus Wowereit proclaimed "Berlin ist arm, aber sexy" (poor but sexy). Since then, the city became an international attraction for a young creative movement in the arts, culture and innovative business start-ups, has experienced substantial population growth and which – after a period of slow development - has also grown economically.

According to the results of several interviews held in the course of an on-site visit, it was repeatedly argued that this growth has also led to an increased competition between various uses of land and to an intensive and in parts also controversial debate on the appropriate policies to cope with this emerging shortage of land. This debate and the regained budgetary leeway to manoeuvre has also given rise to several policy reactions. These include drafting a new Urban Development Plan (UDP) Economy, a reversion of the city administration to some policy measures that had already been in place before the city's financial crisis and generally spatial planning taking a more active role on the land market of the city. While individual measures have not gone uncriticised, there seems to be a consent among the relevant actors that in this changed situation the city administration must take a more strategic role in the future management of land use patterns.

The city is marked by massive structural change. This is evidenced by the lively start-up scene and the high founding rates of enterprises (that is also paired with a high rate of enterprise closures) and the large number of major development projects in the city (e.g., the development of the new Berlin airport at the outskirts, the associated plans for the conversion of old inner-city airport or the investment of Tesla in a new factory in the adjoining federal state of Brandenburg to name just a few). Accommodating and allowing for this massive structural change clearly puts additional demands on urban planning, in an environment where residential uses often get priority over economic functions, as it implies that space must be provided both for the demands of the new activities as well as the pre-existing enterprises that are also rapidly changing their structure. Striking the balance between the support for new activities and support for the incumbents is therefore likely to remain an important topic for policy making in the future.

The larger city area is also marked by a long-standing tradition of joint spatial planning at the level of federal states and of cooperation at the more small-scale local level. This planning is mainly of an indicative nature, with the concretisation left to lower tier administrative levels and cooperation is not facilitated by the fact that the functional urban area of the city borders is divided by the borders between two German Federal states, which have substantial autonomy in regulating the economy, education systems and many other important areas of cooperation. The long-lasting tradition of this cooperation, however, suggests that the value added of joint planning is appreciated by the partners involved.

An analysis of the sector structure of Berlin suggests that the city is diverse and highly service oriented. Within the production sector there is a great diversity across branches with the most

localized branches often being in the logistics sector. Interestingly this feature applies to both the city of Berlin as well as its environs.

Despite the low employment share of the production sector some of the production branches analysed in the MISTA project have shown high employment growth in the years from 2012 to 2019. This applies to logistics branches (e.g., warehousing and storage and postal and courier activities) that have increased their employment levels by over a quarter in this period. This reflects the substantial large-scale investments in the logistics sector in the areas surrounding berlin in the last decades

Fast growth, however, also applies to some smaller consumer goods and high and medium-high technology manufacturing branches, whose employment levels are, however, still low. These branches, that are also most clearly returning to the city, are often characterized by smaller enterprises and smaller production scales and some of them probably also profit from the strong start-up scene in Berlin.

Following the overall employment structure, the network of production sector branches in both the city of Berlin and in the Berlin metropolitan region is very diverse, in the sense that there are few strongly connected clusters of production branches. Therefore, the number of both localized and well embedded as well as non-localized but embedded branches in the region is rather low. The central strongholds of the Berlin economy within the production sector are in logistics. In addition, the knowledge intensive business services that are not included in the current study are a central stronghold of the economy. By contrast, Berlin has a larger number of localized but not embedded branches and an even larger number of branches that are not localized and not embedded.

Given the diversity of the networks in the production sector and the lower number of well embedded branches in the city Berlin lacks an industrial policy to increase the connections of the so far less well-connected branches in the production sector. To this end the currently pursued policies directed at the attraction of investments and of supporting start-ups in the production sector or closely connected branches could be instrumental. Further, previous growth performance suggests that directing such policies towards consumer goods industries and high and medium-high technology branches in the production sector remains important.

Interestingly, considering the entire metropolitan region of Belin does not increase the embeddedness of the individual sectors. This suggests that for industrial policy purposes larger cooperation areas, that cover the entire Berlin-Brandenburg area, may be more appropriate cooperation spaces. In this respect the newly established production clusters for the Berlin-Brandenburg area may be a viable activity.

Results of the SWOT analysis

Strengths	Weaknesses
▪ Strong industrial heritage. ▪ Strong infrastructure and highly connected both nationally and internationally. ▪ Despite real-estate pressure, high level of manufacturing remains in the city (8% of GDP) comparative to other large European urban centres. ▪ The city is both regional and local public authority, streamlining some level of bureaucracy. ▪ Municipal neighbourhood forum (Kommunales Nachbarschaftsforum – e.V. - KNF) at the scale of the metro area. ▪ Existing networking and clusters of research and production. ▪ Joint State Planning Department linking Berlin and Brandenburg.	▪ Public authorities have only few industrial land resources of their own. ▪ The two-tiered administrative structure (Boroughs and Federal State), aligning different levels of governance. ▪ Debt level and financial leeway to purchase land. ▪ The legal prioritisation of land uses in need for protection (such as housing uses over manufacturing), making mixed-use involving residential uses a fraught development concept. ▪ Coordination between the region and boroughs for development plans. ▪ Land owned by the state that cannot be activated soon for development. ▪ Industrial areas have a weaker lobby compared to housing. ▪ Little regional coordination of locations and areas.
Opportunities	**Threats**
▪ Berlin has both local and regional powers. ▪ Urban Development Plan (UDP) Economy identifying 40 industrial production areas to be safeguarded and 11 “Places of Future” to be developed and branded - using this as a mandate ▪ Growing relations between Berlin and Brandenburg, including the innoBB 2025 strategy. The Urban Development Plan (UDP) Economy could move over the regional border. ▪ Area managements: an opportunity to stimulate business ecosystems. ▪ Attracting businesses that are prepared to produce within the region of Brandenburg, with headquarters in the city to link to research and innovation and capital (e.g., Tesla). ▪ New land ownership models, e.g., community land trust.	▪ Planning complexity and slow capacity for public authorities to respond to the needs of businesses. ▪ Rising land prices. Pressure of the real estate market to produce housing (particularly targeting industrial land). ▪ Availability of space: the lock-in effect makes it difficult for companies to grow or shrink. Particularly challenging for start-ups moving into production and established businesses looking for more affordable or larger sites. Industrial area managements: poor financing for a promising service. ▪ Limited financial resources for the public sector to support companies.

At the occasion of a ‘futures workshop’ held in October 2020 the results of the interviews and statistical analysis were presented back to stakeholders, in order to gauge their feedback of the portrait that emerged through the MISTA project research and to also contribute feedback on development opportunities. In particular based on their experience and the results of the project the stakeholders contributed to developing a SWOT analysis (see table above) and discussed future policy options. In the course of this the stakeholders stressed a number of key points.

Firstly, industrial land is under serious tension with residential activities due to German law favouring housing as a land use in need of protection of production effects such as noise and smell. Secondly, planning has not evolved to embrace 21st century industrial activities that are prevalent in cities like Berlin where services-like activities such as design and prototyping are prevalent. Finally, which metropolitan scale production processes are an attractive concept (such as with the new Tesla factory), in practice state planning and local government within Brandenburg are challenging for Berlin to reconcile with so the focus remains on the State of Berlin.

Abbreviations

AA	Agglomeration Areas
ARDECO	Annual Regional Database of the European Commission
COVID-19	Coronavirus disease 2019
DG REGIO	Directorate General for Regional and Urban Policy
EC	European Commission
ELFS	European Labour Force Survey
ESPON	European Territorial Observatory Network
ESPON EGTC	ESPON European Grouping of Territorial Cooperation
EU	European Union
EU 15	European Union countries that were member states prior to 2004 (incl. UK)
EU 13	European Union countries that joined after 2004
FDI	Foreign Direct Investment
FUA	Functional Urban Area
GDP	Gross Domestic Product
GVA	Gross Value Added
HR	Human Resources
IAB	Institut für Arbeitsmarkt- und Berufsforschung, Die Forschungseinrichtung der Deutschen Bundesagentur für Arbeit (Institute for Employment Research, The Research Institute of the German Federal Employment Agency)
ICT	Information and communication technologies
ISTAT	Istituto Nazionale di Statistica (Italian National Institute of Statistics)
JRC/EC	Joint Research Centre of the European Commission
LAU	Local administrative units
KIBS	Knowledge intensive business services
LQ	Location quotient
MISTA	Metropolitan Industrial Spatial Strategies & Economic Sprawl
MR	Metropolitan Regions
NACE	Nomenclature of Economic Activities for Statistics
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Cooperation and Development
POLIMI	Politecnico di Milano
R&D	Research and Development
SME	Small and medium-sized enterprises
SBS	Structural Business Statistics
SWOT	Strengthens, Weaknesses, Opportunities and Threats
US	United States
WIFO	Austrian Institute of Economic Research
WIOD	World Input Output Database

1 Introduction

The MISTA project aimed to develop an understanding of the current contrasted and complex relationship between the city and industrial land, manufacturing and productive activities. The project does so through producing an updated and critical understanding of how the sector has evolved over the last decades across Europe and in particular in large urban areas.

The project intends to support (re-)developing a strategic relationship with manufacturing and production systems within the contemporary urban economy and life. In this perspective, the project aims at considering critically the complex debate on the consequences of deindustrialization and changing of the urban economic base. In doing so it heavily builds on the experiences of the seven stakeholder cities/urban areas (Berlin, Oslo, Riga, Stuttgart, Turin, Vienna and Warsaw).

In Berlin research and consultation activities were conducted between October 2019 and December 2020. Firstly, a questionnaire was prepared by the research team and filled in by the local stakeholders in November 2019. This was followed by an online interview with the main representatives of the city and urban area in December. On the basis of the desk research, data analysis, the results from the questionnaires and interviews, a summary paper has been elaborated. This served as a starting point for the extensive, 3-day long visit in February 2020, where MISTA researchers visited Berlin and conducted a series of on-site discussions with the local stakeholders. As a result, the first draft of the Berlin case study report has been prepared by May.

According to the original plans this report should have been validated by an on-site futures workshop in Berlin in the course of May-June 2020. However, COVID-19 made this impossible, thus the workshop had to be postponed to October and even then, could only be organised online. Despite this difficulty, the workshop gave a good opportunity to critically revise the statements of the report and also gave the possibility to further develop it in a co-creative way, using inspirational cases as the basis for creative, future-oriented thinking.

The final results of the city case studies are used in the MISTA project in two major ways. Firstly, a comparative analysis has been included in the main text of the final report. Secondly, city case study reports are annexed to the final report as self-standing descriptions and critical discussions of the case of the given city/metropolitan area.

The Berlin case study report on the following pages summarises all the knowledge gathered in the different activities during the one year of the research. The report does not intend to provide ready-made suggestions for the city, as the local stakeholders are very well aware of the local situation – even if different local actors have different viewpoints in some issues. MISTA rather aims to investigate the transferability of the major statements distilled from the comparative analysis, and the potential validity of inspiring practices of innovative metropolitan areas of the EU, considering the particular local conditions of the Berlin metropolitan area.

As mentioned, the MISTA research has been conducted under very special circumstances, dominated for more than half of the time by the restrictions caused by the pandemic. The spread of COVID-19 has impacted not only the workflow and organisation of the project, but also in a more fundamental and challenging way the relevance of the results when the socio-economic fallout becomes more apparent. The empirical data, the interviews and also the site visits reflect the situation before the pandemic. Moreover, the longer-term effects of the pandemic, the changing context for industrial areas and manufacturing, are not fully known yet, there are only different hypotheses raised which are partly contradicting each other. From all these it follows that the MISTA report cannot address the most recent challenges and opportunities presented to the urban areas and to the local manufacturing and production activities.

The Berlin case study report begins with the description of the state of manufacturing in the city region. This is followed by the evaluation of the potential of productive sectors, based on sub-sectoral data analysis. The next section summarises the outcomes of the futures workshops. The main body of the report is followed by an annex, including further details of the data driven SWOT analysis.

2 State of manufacturing in the city-region

2.1 Main demographic/social and spatial development trends

Two related recent historic events still have a strong impact on the land use patterns as well as industrial development in Berlin.

The first is the separation of the city until 1990. The Eastern part belonged to the former German Democratic Republic (GDR) and was part of a centrally planned economy. This part, while highly industrialized, was marked by the typical structural characteristics and inefficiencies of communist planned economies. The western part was part of the Federal Republic of Germany that had no direct land borders with the remaining part of the country. Lacking market access made this an unattractive location for economic activities. Thus, most of the larger scale production in the city was heavily subsidized up to the beginning of the 1990s. This led a number of larger firms that had either previously been located in Berlin (e.g., Siemens, Bayer) or had newly moved to Berlin to establish mainly “extended workbenches”.

As a consequence, when Germany and the city was re-unified (and subsidies to Western Berlin ended) Berlin had an atypical economic structure for a capital city. The western part lacked headquarters, as much of the production was related to assembly. By contrast many of the enterprises in the Eastern part faced bankrupts due to their lack of competitiveness. Nonetheless planners expected rapid population growth (with some estimates suggesting a population growth from 3.4 in 1990 to 5 million in the long term) in the city at the time, due to its regained function as the capital of Germany. Similarly, economic forecasts were optimistic with respect to the depth and duration of the so-called transition crisis and expected that economic troubles would be overcome within a few years.

These expectations were not met. Until the mid-2000’s the city experienced both a population decline as well as a reduction in employment. The population levels of 1995 were reached again only around 2010. During the early 1990’s jobs in industry and production dropped almost by a half from ca. 200.000 to 100.000 resulting in a declining share of manufacturing in the GDP to 9% (from 17.5% in 1991) and the city[1], which is also a federal state, ran into severe financial difficulties. This was the second important event impacting on current policy. It led to the privatization a substantial part of state-owned land and municipal housing stock. It also resulted in the abolition of a number of pre-existing policy instruments that had been used to provide support to production in the city before. Thus, the city administration gave up a number of well-established, historically grown and also widely accepted instruments of spatial planning. Land was, however, in ample supply at the time and land prices were rather low in comparison to other large cities in Germany and Europe.

[1] In part this rapidly decreasing manufacturing share is owed to the fact that as Berlin became the capital again, a number of ministries and other institutions of the federal state moved to Berlin and this also helped in fostering growth in the media sector. This automatically fostered the tertiarization of the city.

Table 1: Key data on Berlin.

	Berlin		**Capital City Region[1)]**	
	2018	Growth since 2015 (%)	2018	Growth since 2015 (%)
Population (Thousands)	3.629	3,8	5966	2,9
GDP (billion Euro)	145,7	16,9	190,3	14,9
Area (km2)	891		30545	
GDP/cap	40146	12,5	31895	11,2
Employment	2.016		3140	
Share of manufacturing in GVA[2)]	11,0	-0,5	14,0	-0,5
Share of manufacturing in Emp[2)]	7,0	-0,5	9,4	-0,5

Source: Eurostat, 1) Berlin and Brandenburg 2) level 2017, change in percentage points.

A recent study evaluates the city according to three indicators also emphasized as main strategies in the Berlin Strategy "growing, smart and creative economy", "urban, green and mobile life quality", "solidaric, responsible and engaged society". In a comparison of 15 capital cities Berlin is placed 4th in terms of talent (economic dimension). 11th in ecology, mobility, and tolerance (ecological and social dimension) 9th in life satisfaction, and participation, and technology 13th in administration. Also, all indicators (except the one relating to administration) have improved since 2008-2009.

Another specific feature of Berlin is that until the re-unification suburbanisation was impossible in the western part of the city and had been of low intensity in the Eastern part. This also applies to the movement of companies to the environs. This too was impossible in the western part of the city and out of the realms of decision of enterprises in the planned economy of the Eastern part. In addition, the surrounding area of Brandenburg was also part of East Germany and went through the same struggles as Berlin. It is also a large federal state of Germany. Next to the areas surrounding Berlin it covers a number of rather remote and structurally weak municipalities. It also has a below average GVA per capita and manufacturing share in employment. Further, despite recent improvements, Berlin's production enterprises are still quite strongly oriented to the domestic market (i.e., have low export shares).

Nonetheless interactions between the city and the environs are intense and in 1996 there was a plebiscite on whether Berlin and Brandenburg should merge and become a joint federal state of Germany. This proposition was, however, turned down by popular vote, but was a major impulse to the restructuring of collaborative spatial and economic policy in the two federal states. The larger Berlin area, which is the subject of this joint policy, has been defined in a number of different ways. These can be considered to be organised as concentric circles and have also been subject to repeated revision over time. The largest of this is the capital city

region of Berlin and Brandenburg (Hauptstadtregion Berlin-Brandenburg). It encompasses the entire federal states of Berlin and Brandenburg and has over six million inhabitants. A common spatial development plan (Landesentwicklungsplan Hauptstadtregion) covers the entire area of both federal states but sets out only vague determinations for manufacturing land use and locations.

Map 1: The cooperation areas of the Berlin region.

Source: City of Berlin. Note: The map shows the capital city region (i.e., Berlin and Brandenburg. The pink area is the city of Berlin, the pink line delineates the larger Berlin area (Berliner Umland).

The smallest definition, by contrast, is the Berlin environs, which encompasses the city and its immediate surroundings (mainly the contingent municipalities) and basically is the functional urban area. This is the area most relevant for local co-ordination and is also the focus of some co-ordination institutions such as the municipal neighbourhood forum (Kommunales Nachbarschaftsforum e.V.).

Finally, in between these two definitions is the region described in the annual spatial monitoring report of the larger Berlin area, as an annual report on the economic and demographic development of this region. This area is probably a good frame for an economic analysis, as it encompasses an area that exceeds the spatial extent of local labour markets and functional urban area and more closely mirrors the spatial extent of networks in production.

2.2 Main trends in the development of the economy and manufacturing

The recent economic and demographic development of the city of Berlin suggest that it has managed to achieve a turnaround relative to the difficult situation in the 2000s. In the 2010s Berlin has been growing rather rapidly in terms of population. Up until 2018, 40.000 persons migrated to the city annually. Recently there have been signs that this population growth has reduced (to around 20.000) despite immigration remains to be the main source of population growth. At the same time the economy started to improve too. GDP growth is higher than the national average since 2015 although productivity is still below the German average (around 97%) due to a lower share of manufacturing.

One of the central drivers of this renewed growth are start-ups. These were attracted to Berlin in the early 2000s by the low land prices that allowed creative people to benefit from the amenities of a city at low cost. They also profited from the many high-quality universities located in the city that make Berlin an important research centre and knowledge hub in Europe. These start-ups receive ample support and finance from the city administration as well as private financial institutions. They can also rely on effective institutional support. Most of these start-ups are, however, still small in terms of employment and sales and ensuring their continued growth is one of the challenges for economic policy.

The larger share of employees in Berlin is thus still working in the traditional enterprises located in the city. These in general remain to be strongly oriented to the internal market and also remain to have a rather untypical functional specialisation for firms located in large cities. The low share of headquarters among the enterprise persists. Also, in this respect there are, however, some signs of a change.

On the one hand this applies to investments of large companies from both abroad and from other parts of the country. Thus, there have been a number of larger investments from major logistics firms (such as DHL and Amazon) and also investments of the metalworking industry (by firms such as Mercedes Benz, Rolls Royce, Viessman, BDH Hausgeräte GmBH, ThyssenKrupp Rothe) have boomed in recent years with the most recent example being the plans for an investment, by Tesla just outside Berlin, which may result in the establishment of a Tesla research centre within the core city.

Most of these large-scale investments are, however, made at the outskirts of the city in municipalities such as Falkensee, Brieselang and Ludwigsfelde (for logistics) and Ludwigsfelde, Blankenfelde-Mahlow, Mittenwalde, Nauen and Eberswalde for the metalworking industry enterprises. Given the size of investments the reason for these firms to choose the outskirts as well as the question whether or not these firms should have been more actively attracted to Berlin are an important issue in policy debates.

In this debate most of the actors emphasize that, given the shortage of land in the city, it is questionable whether the city could provide space for all these investments and also argue that

the still available land should rather be used for high value-added activities that are associated with low traffic and little emissions. It is also argued by these actors that it is questionable whether the mentioned firms could be motivated to move to the city given the high land prices, the limited space for potential future expansions and the difficult transport situation in the city. According to this view it may be better to have these enterprises in the outskirts, where the population of Berlin still can profit in terms of jobs and income, than in other parts of Germany.[2] There are, however, also some actors that would like the city to take a more active role in attracting (at least some) of these large investments (in particular in manufacturing and less so in logistics).

On the other hand, the changes within manufacturing and the start-up boom led to a notable change in the structure of employment in the city. Through this mainly high skilled and jobs are expanding also within the producing sector, while low skilled jobs are declining. As a result of this there are also accounts of shortages of labour that seem to be particularly pronounced in high skilled technical jobs and IT-qualifications.

One additional result of the increased demographic and economic dynamics since the mid-2010s was a rapid increase in demand for land and a land price hike. This is putting the traditional industrial locations but also trades and craft businesses (Handwork) under pressure. Further, large contingent land plots (in excess of 50 hectares) suitable for larger investments and production locations are almost impossible to obtain within the city limits. The only area where such a development could still be thought of is Buchholz Nord.[3]

These dynamics are expected to continue. Current estimates are that employment in the city will increase, from 2 million to somewhere around 2.2 million. Manufacturing is expected to stagnate such that the share of manufacturing in both employment and GVA will continue to decline in the medium term. The strongest growing sectors are expected to be (1) research, development and media (2) enterprise services and (3) social services.

Population is also expected to grow substantially, but at a slightly slower pace than previously. Current forecasts suggest that there will be an annual immigration of around 20.000 people in the next decade. In addition, according to a study by the Industrie and Handelskammer (IHK) modern production technologies such as industry 4.0 are likely to increase demand for land and according to most observers solutions focusing on a substantial increase in density are difficult to organize on account of e.g., the high costs of locating production related activities in

[2] In part this is also reflected in the stated policy preferences of the city. For instance, in the area of logistics the spatial plan for Berlin and Brandenburg foresees a number of logistics centres in the outskirts of Berlin, as the city has no comparative advantages in that branch.

[3] This is a 180 hectares area that was still planned as a residential area in GDR times, but was never developed. Currently it is used by a pyrotechnics factory. This area has been earmarked for various production uses in the past but has proven to be difficult to develop. Previously it was envisioned that BMW and Magna could invest in the area, while more recently some hoped that the Tesla investment could be located there.

multi-storey buildings. Mostly such uses are limited to food processing. The city therefore expects the scarcity of land to intensify in the next decades.

This scarcity is a new phenomenon for Berlin, which in the two decades after the re-unification has been used to have sufficient land reserves and has led to increasing competition between different interest groups. One line of competition is between residential and productive uses of land. Here in general the feeling is that economic uses of land are becoming increasingly contested through the financially more lucrative and also politically more popular residential uses. Another line is between the newly emerging enterprises (i.e., the start-up scene) and the more traditional productive uses. Here it is often argued that in particular the small-scale trades and repair workshops can often not afford the large rent increases in particular in the inner city and are forced to either move to the outskirts of the city or to close down. Finally, a third area of competition is associated with the increasing demands for public infrastructure (e.g., schools and kindergartens) that arise along with increased residential development.

The empirical basis on which the debates over this competition are led seems to be rather thin, however.[4] Thus, anecdotal evidence suggests that some of the traditional producers have moved out of in particular inner-city locations to areas on the outskirts of the city or to areas outside the administrative territory of Berlin (i.e., Brandenburg). There are, however, large differences in the assessment of the quantitative importance of this movement. Some consider it to be a major factor, others of minor importance or a natural process in a restructuring city. Irrespective of this, in particular the increasing challenges of providing a sufficient supply of crafts and repair enterprises are also increasingly seen as problematic in the popular debate.

These differing perceptions seem to be strongly related to the specific area of the city and the sector considered by the respective observer. Relocation seems to be somewhat stronger from inner-city locations (i.e., locations within the S-Bahn ring) to the outskirts of Berlin than from the administrative territory of Berlin to Brandenburg. It also seems to be somewhat stronger in the traditional trades and repair services than among industrial enterprises in the perception of some actors.

All in all, there is, however, very little empirical evidence as to the quantitative importance of the process of de-industrialisation of certain areas in the city or on the importance of relocation. The few studies that do exist lead to only partial results. One study conducted by the Industrie und Handelskammer focuses on the enterprises leaving Berlin. It finds that in the period from 2013 to 2018 3.740 enterprises left Berlin of which 964 settled in Brandenburg and that around 15% of these relocations were primarily motivated by lacking land for expansion in the vicinity

[4] This lack of empirical information is due to a mixture of a complex institutional structure which leads to many split competencies, a bad data as for instance the structural plan (i.e. Flächennutzungsplan) does not report areas below the size of 3 hectares, (which implies that smaller areas for productive uses disappear in this planning document and are attributed to other uses (such as residential uses) and a lacking necessity for the development of analysis tools in the past, when land was in ample supply in Berlin.

of the previous site. A study conducted in the Kreuzberg area, by contrast, considers the re-use of the vacated premises. It suggests that these are often subsequently used by other (higher value added) enterprises and that the substitution through residential uses is a secondary phenomenon. Another study, which pertains to German cities in general, shows that founding rates of producers in consumer industries and (the high-price segments) of the crafts are actually higher in inner city locations than in the outskirts of cities. These studies are being heavily debated on and the generality of their results is also questioned by some.

One plan of the city in cooperation with the crafts association (Handwerkskammer) has therefore been to establish a data management system to survey the land use patterns for productive uses in a more encompassing way. These plans have, however, not been realized and have met many practical issues due to data constraints.

2.3 Main factors affecting locational choices of manufacturing

The land market in the city is thus rather strained and marked by intense competition. This applies in particular to land earmarked for production uses.[5] According to the estimates of the city the land reserves for economic uses have substantially decreased in the last decade. Currently there is a total reserve of 1.025 hectares of land for such economic uses, which is 16% lower than in the last decade. Similarly, the IHK has conducted an analysis of 17 places where production can take place in Berlin. According to this analysis no further areas for development are available in 13 of these locations. Finally, also rent prices for both commercial and residential uses have increased substantially. Although prices vary across locations informal evidence suggests that enterprises renewing their lease on their workshops in inner city location may experience rent increases from below € 10, -- per m^2 to over € 20, --.

Next to this, the mobilization of land in private hands is an issue, as private owners may not always be willing to sell or develop a site for productive use, but for instance hope that this land may be dedicated to residential uses in the future. Currently the city estimates that it has 300 hectares of land that could be developed for further economic uses. Of these, however, 2/3 are owned by private owners, who cannot be forced to sell or develop this land. Thus, an additional issue is that while land is in principle available, often it is not on the market for any uses. There are also few instruments to mobilize this land.

Among the reasons influencing the companies' choices of location in the city according to observers – despite some variation in the relative importance of these factors across different sectors – the following factors are relevant:

- High rents and land prices and also the very rapid increases in these prices as these on the one hand are an important cost factor and their dynamics reduce the plannability and foreseeability of costs in the future.

[5] This is particularly the case in the west of the city. The last larger areas for development in Berlin are in the Northeast and the southeast. The western part of the city has only very limited land reserves. Thus, city development is moving to the north- and southeast.

- A lack of flexibly but reliably available land in the case a company wants to expand its operations on the existing premises.
- A difficult situation with respect to transportation and logistics due to general traffic congestion, lack of parking spaces and similar issues, that apply most strongly to inner city locations.
- A hostility (perceived by enterprises) of residents to productive uses whenever they are associated with even minor noise, smell or pollution, which in conjunction with a weak legal position of producers relative to residents may lead to very costly adjustments of the production process (in particular in mixed use locations).

2.4 Development preferences of the city (region) leadership

Policy makers in the city, in their aim to steer and moderate land scarcity, have intensively reacted to the challenging situation in the land market through a number of initiatives.

In particular the city has re-designed the Urban Development (UDP) Economy 2030 (Stadentwicklungsplan Wirtschaft 2030). This spatial plan together with a traffic plan and a plan for residential development will serve as the basis for spatial planning and development in the next decade. The plan presents a coherent strategy for spatial economic development of the city that is among others based on strengthening the city's competitiveness, increasing mixed use zones, strengthening science and technology and improving regional governance. The plan also presents a spatially differentiated strategy for the future development of individual areas. To this end it highlights 40 existing industrial production areas to be safeguarded, 11 "Places of Future"[6] and also introduces a new zoning category for mixed uses referred to as "Urbane Gebiete".[7]

The "Places of Future" are areas where the city aims to locate start-ups. Each of these zones hosts (or will host) a university and/or major research institutions and is devoted to a particular theme that is based on a description of the unique features of the particular area and also defines the kind of productive uses that can be placed there. Further there is an own office to provide for networking across the "Places of Future".[8] The 40 industrial production areas, by contrast, are locations where more traditional manufacturing is taking place. These areas need to be safeguarded and actively being developed. They are usually supported in their development by an area management, but there are no special financial incentives (no tax reduction nor subsidies) for locating in these areas.

A further feature of this plan is that for the 40 areas reserved for productive use there is a very strong political commitment to avoiding mixed uses with residential and retail trade uses. This

[6] These places have been defined by the Senate Department for Economy, Energy and Public Enterprises.

[7] These areas provide for an up to 80% residential use with the remainder being dedicated to commercial uses.

[8] The aim is to provide cheap locations for production areas in these "Places of Future". Rents should be between 8 to 9 € and thus substantially below current market prices.

formal determination within the plan enables planning authorities to exclude non-industrial uses from these areas through using the German planning law.

The plan thus provides a clear orientation as to the development strategy of the city and also seems to be generally accepted by most actors. Despite this and, given the importance of the plan, not surprisingly, some of the features have been subject to intensive debate. For example, with respect to the “Places of Future” one criticism raised, is that they may not take sufficient account of the specifics of larger scale production enterprises, as these – despite collaborating intensively with universities – do not require the immediate vicinity of these institutions for their cooperation.

Another topic raised has been that the “Places of Future” differ in the degree to which they have already been implemented. For instance, Adlershof is an area which has already been existing for over 2 decades as a major urban development initiative endowed with ample funding. Adlershof – after some difficult times – is currently booming. It has 1100 enterprises, 60 science institutions, 2 universities and 2 founding centres as well as 60.000 employees and a few thousand students. In this area it is becoming increasingly difficult to cater for the rising demands for land by companies. By contrast, the major urban development area of the Tegel airport has not been vacated yet and other “Places of Future”, e.g., Clean-Tech-Park in Marzahn, do not have a clear connection to an applied university yet. It is thus still unsure how and whether these plans materialize.

Similarly, with respect to the newly introduced mixed zones a fear is that rather than increasing the land available for production, they may reduce this. This is because as more residential uses move into these areas, the space for noisy or burdensome activities may be reduced. This in part also is because, legally, the interests of residents receive priority over the interests of enterprises, irrespective of the zoning category of the land and the circumstances under which residential uses were developed in an area. This implies that in case that residents feel harassed by environmental impacts of production (e.g., noise or smell), their concerns take precedence over those of the affected producers irrespective of the time enterprises or residents have resided in the area. Thus, in case of legal conflicts enterprises usually have only a very weak position in mixed use zones.

2.5 Tools through which the municipality is able to control the development processes

In Germany, the federal government is responsible for providing the general legal guidelines of spatial planning, while the municipalities are responsible for the concretization of through land use planning (zoning regulation) (Flächennutzungsplan) and local building plans (Bebaungspläne). The municipalities also profit from enterprises based on their territory through local tax revenues.

In Berlin, the situation is slightly different as it is both a federal state and a municipality constituted by 12 boroughs. Thus, the state of Berlin government (Senate) usually provides

only framework plans for the entire city while the implementation through local building plans is in the responsibility of the individual boroughs of Berlin. For instance, the city's recent Urban Development Plan (UDP) Economy 2030 explicitly states that the general guidelines laid down in this plan have to be implemented through the boroughs local building plans. The state of Berlin government can, however, define large development projects of city-wide interest for which the Senate is then solely responsible. Further it can also veto boroughs in elaborating local building plans if these do not accord with the Senate's directives. Both these options are not used very often as they represent an intrusion into the autonomy of the boroughs.[9]

This system has the advantage that it leads to a strong consideration of local preferences in the spatial planning process and potentially also a higher involvement of residents. It, however, holds the disadvantage that it increases the already large number of actors involved in the implementation of development plans. This leads to additional co-ordination costs in the planning process. It may also cause inefficiencies in planning, in particular when development areas reach across district borders. Some actors also mention the boroughs lacking incentives for industrial development, as they do not receive revenues from local taxes on enterprises in a similar way as the municipalities in other federal states.

In general, the process of acquiring construction permits is seen as rather lengthy and bureaucratic, by many actors. The reason for this is mainly seen in the large number of actors of actors involved in the process.

In addition, two issues specific to the productive use of land are that many (mainly small scale) producers operate in locations that are not safeguarded by zoning law. This means that an enterprises' location is actually dedicated to other uses according to the current zoning plan, but that it is allowed to continue operating in this territory on account of having been there already before the zoning regulation was applied. These firms are then severely limited specifically when they would like to expand their business and are also threatened by severe rent increases when their lease expires.

Next to this the city of Berlin has also developed some new instruments to influence the location choice of enterprises. One of these is the so called Bodenbevorratung which inter alia foresees that Berlin will aim to buy new land. The focus of these purchases is on land that is owned by federal agencies, because there is a commitment to keep land in public hands in these agencies. Further areas are previous premises of railways and similar (public or previously state owned) enterprises that are not needed any more.[10] In the case of these areas, however,

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[9] An instance where the former option has been used, though, is the envisioned development of the airport of Tegel.

[10] The land owned by the federal state of Germany that becomes available usually is territory that is not needed any more. The prime example are conversion areas (i.e., former military areas) of which there are, however, only very few in Berlin, or buildings such as a hospital or federal research canters which are, however, often not suited for production on account of their location or exiting environmental regulations.

the city competes with the private market as these enterprises are required to maximize profits, too. Further the railways have developed a number of areas themselves. Acquisitions in the private land market are more complicated on account of the high costs and because the land will later be rented on the market below market prices, which automatically results in a budgetary loss that is difficult to argue for the city administration.

The actual acreage of land for industrial use owned by the city is difficult to estimate, as it is often owned by different agencies and levels of government (e.g., by the boroughs of Berlin or another independent organisation controlled or owned by the city of Berlin). The general objective of policies pertaining to the land owned by the city is, however, to use it to support groups that are not able to pay the market rents.[11]

Another recently implemented instrument is a program whereby landowners of relevant plots are directly addressed and made aware of the possibilities of densification and more efficient land use made available to them.

2.6 Potentials for metropolitan area cooperation

Berlin and Brandenburg also have a joint spatial development plan (Landesentwicklungsplan Hauptstadtregion). It sets the guidelines along which the two federal states want to develop different areas. To this end, the states of Berlin and Brandenburg have founded a joint planning authority, located in Potsdam. This Joint State Planning Department performs the tasks of the highest authorities responsible for spatial planning in both federal states. Therefore, it comprises staff members of both federal states authorities, the Berlin Senate Department for Urban Development and Housing as well as the Brandenburg Ministry of Infrastructure and State Planning.[12] This department is amongst others tasked with developing common spatial plans as well as common structural and development concepts that cover the whole area of Berlin and Brandenburg and approving regional plans for the smaller single regions within the common area of the states. In addition, the agency provides an annual regional planning report.[13]

The central strategic aim of the joint plan (Landesentwicklungspan) is to develop a star shaped agglomeration around the city of Berlin. The main development areas should be along the major

[11] This applies to both housing and economic uses.

[12] To be more specific planning at the level of the federal state (i.e., the framework plan) is a joint responsibility of the federal states of Berlin und Brandenburg which is why the joint planning agency was founded through a state treaty. The agency is staffed by employees of the state of Berlin and of Brandenburg, which amongst other develop the joint state development plan. Regional planning (i.e. the competencies allocated to government level below the federal state remain in the responsibility of the respective regional bodies.

[13] This specific institutional set-up whereby two federal states jointly develop spatial framework plan is unique in Germany and is owed to the developments in the 1990s, when the two federal states planned to merge.

transport routes to and from the city, while the spaces in between are intentionally left open, green space.

This joint planning represents an innovative approach to cross-border planning and has been ongoing in the last 20 years without the principal importance of joint planning being questioned in that time. Naturally, there are also a number of expectable differences in interests in the procedures, though. Thus, for Brandenburg, which is not only composed of areas that are located close to Berlin, one repeated challenge is to strike the balance between policies directed at the more remote areas of the state and the needs of the locations close to the capital. Further the star shaped development leads to some complaints that transport routes connecting localities around Berlin directly may be underdeveloped (i.e., you have to travel through Berlin).

Although a big advantage of this system is that it ensures coherent strategies for the complete region, there are also always controversies if specific municipalities want to develop their area differently from what is foreseen in the joint state level plan. As a consequence, in each planning period there are occasions where individual municipalities sue against the planning document as they have a feeling that their autonomy is impinged upon.

Finally, the joint plan (and policy in the Berlin metropolitan area in general) is also sometimes criticised for taking too little account of integrating different policy fields (i.e., viewing transport, housing and economic development jointly).

As part of their collaboration Berlin and Brandenburg have also agreed on a "Joint innovation strategy of the states of Berlin and Brandenburg" (innoBB 2025) in January 2019. The aim of this strategy is to promote 4 joint clusters (Healthcare, ICT, media and creative industries, Transport, Mobility and Logistics Energy technology and Optics and photonics) and to position Berlin-Brandenburg at the forefront of international competition in these areas.

The implementation of more concrete specific projects to jointly develop certain areas in the Berlin environs (e.g., through intercommunal enterprise zones), has proven to be much more difficult, however. The only recent exception to this is the development of the area around the new airport in Berlin. For this there is joint development program that has been carried by Berlin, Brandenburg and the Republic of Germany. For this development Berlin has bought industrial land of 120ha of which 30 are already given away. This area is currently developed by private firms and although development is delayed due to the slowing down of the airport, the cooperation is working. By contrast, in the context of the recent investment plans of Tesla most observers consider the coordination between Berlin and Brandenburg to be marginal. This is seen as a deficit given that many of the workers at that firm will come from Berlin or other more distant parts of Brandenburg (or even from Poland), which poses major challenges to transport planning.

Next to the formal and legally binding joint indicative planning strategy at the states level, at a more local level there is also the so-called municipal neighbourhood forum (Kommunales

Nachbarschaftsforum e.V. - KNF), which has 4 informal working groups (North, South, East, West). They comprise the boroughs of Berlin and their bordering municipalities and are organized according to geographic principles with some of the boroughs or municipalities (located at the edges of the respective territories) belonging to more than one working group.

These organizations, which by now already exist for 20 years, have no formal power yet but are forums where discussions can be held, and information can be exchanged. They meet three times a year and in addition hold one annual conference where a specific topic is discussed in detail. At the occasion of this annual conference also a joint political declaration is formulated and presented to the responsible state level administrations.

So far, the municipal neighbourhood forums have had no legal status and their organization has been paid exclusively by Berlin. It is, however, currently planned to gather these institutions into a registered non-profit organization and to require all its members to pay a small membership fee (of € 0,1 per inhabitant). It is expected that this move to a non-profit organization would increase the stability of the organisation as it would then also have a legal basis and formal statutes. Also acquiring funds through membership fees is expected to further increase the commitment of the involved partners. The envisioned changes are at the current point plans and it is probably too early to talk about their effects.

The longevity of these institutions suggests that they are advantageous for both the partners involved (as participants) and the city of Berlin (as the funding agency). There are, however, also some imbalances within the institutions that are sometimes an issue. In general, the municipalities of Brandenburg enjoy more autonomy than the boroughs of Berlin. By contrast, the boroughs of Berlin may have a population of 300.000 people, while the municipalities in Brandenburg may number less than 10.000 inhabitants. This implies that the municipalities in Brandenburg can autonomously decide a lot more than the boroughs can, although the policies of the boroughs are more important in terms of the people affected.

Nonetheless these institutions are seen as having been effective in reducing stress, sharing information and formulating joint policies vis-à-vis higher tier organizations as well as generating trust.[14] Their effectiveness, however, strongly depends on the goodwill of the members and other authorities. The intuitions are also a good way for those responsible to get to know each other (e.g., in instances of personnel changes) and to make informal contacts with the persons responsible for planning in adjacent areas.

2.7 Potential inspirational cases from the stakeholder city-region

A further policy reaction to structural change in the city, has been to reintroduce or envisioning to reintroduce a number of policy instruments that were abandoned during the financial crisis

[14] One example for this is the Tesla project, where the possibility to talk to each other in these institutions has helped to avoid misunderstandings or to reduce different levels of information among those responsible.

of the early 2000's. These policy instruments may also be seen as highly place based on account of the long history (and generally high public acceptance) these measures have.

One example for this is that the city aims to own land and does not sell any of its land but aims to provide this only under long term lease arrangement (so called Erbbaurecht). While this system has a long-standing history in the city, and is accepted by many, it too has been criticised by some on account of being unlucrative in particular for small and medium sized enterprises, who would often prefer to own rather than lease land and for hampering the growth of enterprises. The latter seems to be particularly relevant in instances where enterprises want to use their land as a collateral for an investment loan and the remaining time on the lease is short. The reason for this is that when the Erbbaurecht is used as a collateral for investments it is evaluated at a lower price than owned land, with the discount depending on the remaining length of the lease.[15] In instances of a short remaining lease period, this leads to a low value and the question arises, whether the lease will be extended. Depending on the outcomes of this evaluation this may result in very low values for the lease that can be used as a collateral.

A further example is that the city started an initiative to reinstate the public ownership of municipal crafts and trade centers (Gewerbehöfe). This is another policy instrument that has a long tradition in Berlin. Until the 1990s the city of Berlin was an owner of the Gewerbehofsiedlungsgesellschaft which ran the institutions on behalf of the city. The municipal owned business compounds were essentially located on land owned by the city and were places where trades could settle and where there was only limited residential use. This model existed since 1965. In 2010 the Gewerbehofsiedlungsgesellschaft, inter alia on account of the budgetary problems of the city, was sold to private investors who developed the land mostly into residential areas.[16] Currently the city started to re-initiate these crafts and trade centers. The idea is that the city will provide space at reduced rents to potential firms of crafts and trades, in order to guarantee a supply of the basic material services in particular in the city centre.[17]

The city has also aimed to intervene in the land market and instituted a system of area managements, that exist in all of the boroughs of Berlin.[18] Interventions in the land market have taken the form of aiming to purchase land (mainly from other state actors as privately owned

[15] The usual length of lease is 65 years for economic uses and 99 years for residential purposes.

[16] Two such locations that are still used in this way are the Dragoneraeal and Ratheberg. Of these in particular the Dragoneraeal received a lot of attention on account of intensive citizen's support to maintain the mixed-use characteristic of the area.

[17] In this area the city aims to focus on a dense 4-storey use. Whether the demand for these locations will be sufficient to justify these concepts is still open, however.

[18] Their tasks are: location advice and help with the search for commercial property, knowledge and technology transfer for innovations, information about funding opportunities and funding channels, Support in the recruitment and qualification of specialists, providing contacts to partners, networks and organizations, support in authority and approval management, foreign trade promotion and support in securing the location.

land is usually too expensive) and recent plans for rent controls, which could also impact on rents for commercial uses, that have been met with severe criticism by employer federation. By contrast, individual area managements have also been criticised for lacking efficiency, while on the other hand others (such as the Motzener Strasse initiative as the “blueprint” for these initiatives) can be considered to be best practice initiatives.

3 A data-driven SWOT analysis for Berlin

3.1 Introduction and methodology

Based on the institutional analysis in chapter 1, this chapter presents the results of an empirical SWOT analysis for Berlin. They are based on the analysis of shares and number of employees being employed in different sectors of productive economy (measured at NACE 3-digit level).

The detailed analysis has three main parts: 1) displaying and analysing the productive sectors that provide the biggest employment in the region – compared to the national average - 2) displaying and analysing the sectors that resulted in the fastest growth – compared to the national average - between 2012-2017 and 3) highlighting the sectors that represent the biggest potentials and the highest threats for the local economy.

There is a well-established methodological background behind Point 3 that follows the approach to the analysis of the regional network of branches pioneered by Otto et al. (2014) and Neffke et al (2017A, 2017B). The basis for this approach is the common recognition that innovation (and thus growth) is driven by the exchange of knowledge between firms, having a complementary knowledge base, in the form of labour flow between branches (labelled as “embeddedness”). In addition, the development potential is also based on the existence of a “critical mass” of employees in the metropolitan area being metered by the share of employees exceeding the national average (labelled as “specialisation”).

Table 2: Categories of the empirical SWOT analysis
Development potentials according to degree of specialisation and embeddedness

	Regional embeddedness of a branch	
Regional degree of specialisation	High localisation and well embedded (Strength S)	High localisation but weakly embedded (Threat T)
	Low localisation but well embedded (Opportunity O)	Not localized and weakly embedded (Weakness W)

Source: Otto et al. (2014), ESPON MISTA (2020).

Overall, both the degree of specialisation and the embeddedness in the regional sectoral structure are decisive for an assessment of the development potential of a branch., According to Otto et al. (2014) economic branches in a region can be classified into four different categories, by differentiating, according to the values of their localisation quotient and their embeddedness indicator (Table 2):

1. If the branch under consideration is heavily localized in the region and if this branch is also well embedded in "related" branches, the branch is large relative to the regional economy and it is likely that it will also strongly profit from localised knowledge transfers across industries in the region. As a consequence, its future development prospects should be favourable, and the branch can be considered to be a "strength" of the regional economy.

2. By contrast, a branch with a low degree of specialisation and embeddedness is unlikely to profit substantially from localized knowledge transfers but is also small in terms of the regional economy. Despite the fact that such branches may be of importance for the other reasons (e.g., the presence of natural resources or the satisfaction of local demand) such branches have therefore been regarded as a regional "weakness" in previous analysis from a technological development perspective.
3. Branches that are lowly localised but well embedded are faced by a favourable regional environment of technologically or cognitively "close" branches (and thus diverse opportunities to use a common knowledge base) but are still relatively small. Such branches could thus offer special "opportunities" to develop new strengths through structural policy initiatives in the future.
4. Finally, branches which are highly localized, but only weakly embedded in complementary in the region, tend to be seen at risk which could be reduced by strengthening complementary branches through structural policy initiatives. This is because they are relatively large but are unlikely to profit substantially from their regional knowledge base.

(A more detailed explanation on this methodology can be found in the Annex.)

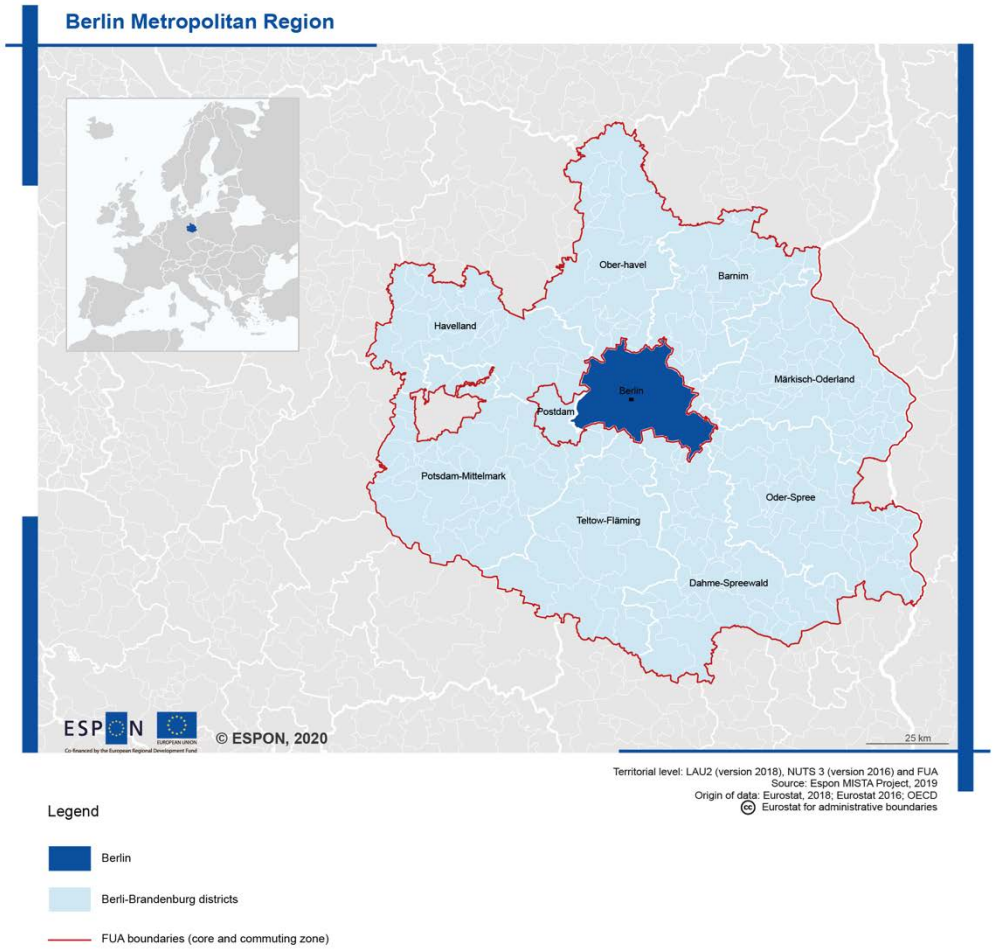
3.2 Spatial scope of data analysis

Since, as already highlighted in the background report to task 1 of the MISTA project, urban regions are open systems and may thus also profit from knowledge spillovers from nearby regions, we present results for three different regions: The city of Berlin, the environs of the city of Berlin and the Berlin metropolitan region, which is the sum of the city of Berlin and its environs. While the city of Berlin is defined from a purely administrative perspective, as the territory covered by the Berlin city administration, the Berlin environs were defined in the course of the project in cooperation with the respective city administration. In defining this region three criteria were applied:

1. The most important of these was an administrative criterium according to which the chosen definition should to some degree reflect the administrative boundaries of existing institutions (or mechanisms) for inter – regional cooperation in the city. This criterium was chosen to ensure to the best possible degree that the analytic results are useful for existing urban planning processes.
2. The second criterium was based on data availability. Since the analysis conducted below requires detailed information on the development of employment at a NACE 3-digit level at a highly granular regional disaggregation level, this criterium prove to be the most constraining in the analysis
3. Finally, the third criterium was based on analytical consideration and was derived from the fact that knowledge spill overs as the central analytical concept guiding the current analysis in all likelihood exceed the regional scope of travel to work areas, which speaks in favour of using larger regions rather than smaller ones for the current analysis.

In the case of Berlin, it was decided to take a territory that covers all the Kreise of the municipalities of the larger Berlin area (depicted in Map 2) as a definition of the Berlin metropolitan region. This is on the one hand because the larger Berlin area is already the focus of some industrial policy initiatives, reflected in the annual structural report of that region. On the other hand, this is dictated by data availability issues.

Map 2: Definition of the metropolitan region of Berlin.



Source: ESPON MISTA (2020).

To analyse the economic structure of this region the research team obtained employment data at the NACE 3-digit level on this region from the Bundesagentur für Arbeit. This data is originally available at the Kreis[19] level for all of Germany. To avoid potential issues with the confidentiality of the data, however, it was aggregated to the level of Berlin city (consisting only of one Kreis) and the Berlin environs (consisting of five Kreise[20]) by the Bundesagentur. The data contain the number of employees (excluding marginally employed) in each of the NACE-3-digit industries located in these regions and in all of Germany for the years 2012 and 2019, such that they can be used to calculate all the indicators considered in the current study (i.e., employment shares, localisation, employment growth and embeddedness.

Two issues related to the data are that it does not contain self-employed and misses some industries to ensure confidentiality. Both these issues are, however, of minor relevance in the current context, as the production sectors we look at are usually characterized by rather large-

[19] Kreis is the name to NUTS 4 regions in Germany

[20] These are: Postdam, Barnim, Dahme-Spreewald, Havelland, Märkisch-Oderland, Oberhavel, Oder-Spree, Potsdam-Mittelmark, Teltow-Fläming.

scale enterprises and few self-employed. Similarly censoring due to confidentiality issues as a rule affects only branches with a low number of employees that are unlikely to substantially bias the overall picture of productive industries in the region

3.3 Size and growth of individual productive activities

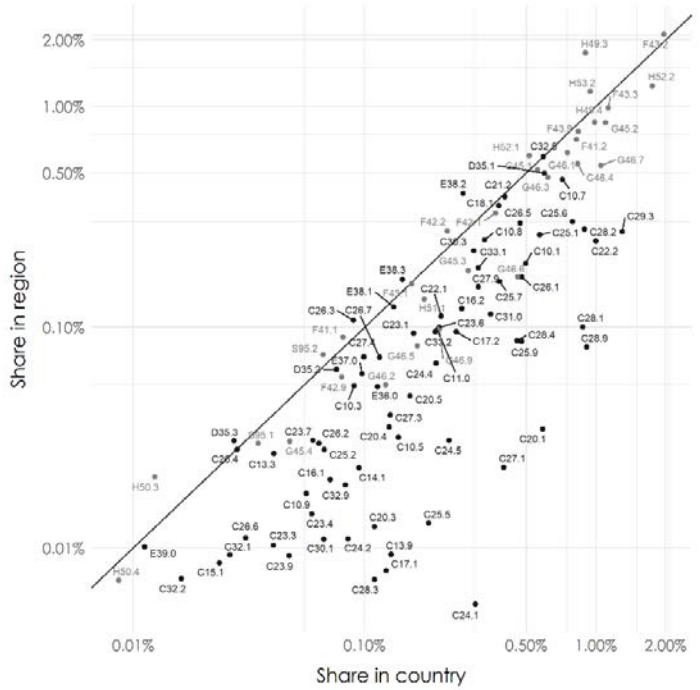
3.3.1 Sector shares

According to this data both the city of Berlin as well as its environs are marked by a rather diverse industrial landscape that is also marked by strong orientation to the service sector. The largest NACE 3-digit branches in terms of employment among the production activities considered in the MISTA project in the city of Berlin are mostly related to logistics, construction and wholesale trade. In the construction sector four branches ("electrical, plumbing and other construction installation activities", "building completion and finishing", "other specialised construction activities", "construction of residential and non-residential buildings") are among the largest ten in terms of employment share. They, however, account for only 3.0% of total employment share in the city in 2019. In logistics three branches ("Other passenger land transport", "Other postal and courier activities" "Support activities for transportation"), accounting for 2.8% of total employment, are among the top ten production branches. Finally, two branches ("wholesale on a fee or contract basis, maintenance and repair of motor vehicles) – accounting for 1.3% of total employment in 2018 - among the top ten are in wholesale trade. In the manufacturing sector only the "manufacture of medical and dental instruments and supplies" belongs to the ten largest production branches (see Table A1 in the appendix). This therefore underlines the low share of production activities that are still located in the city and also highlights the function of Berlin as a major service centre and as the capital city of Germany.

Somewhat more surprisingly, also the Berlin environs are marked by a similar economic structure. Here among the top ten production branches in terms of employment shares five[21], with a combined employment share of around 8.8%, belong to the logistics sector and another four ("electrical, plumbing and other construction installation activities", "building completion and finishing", "other specialised construction activities", "construction of residential and non-residential buildings") with an employment share of around 6.5%, to the construction sector. None of these top ten branches in terms of employment shares is in the manufacturing sector and only one ("maintenance and repair of motor vehicles") in wholesale trade.

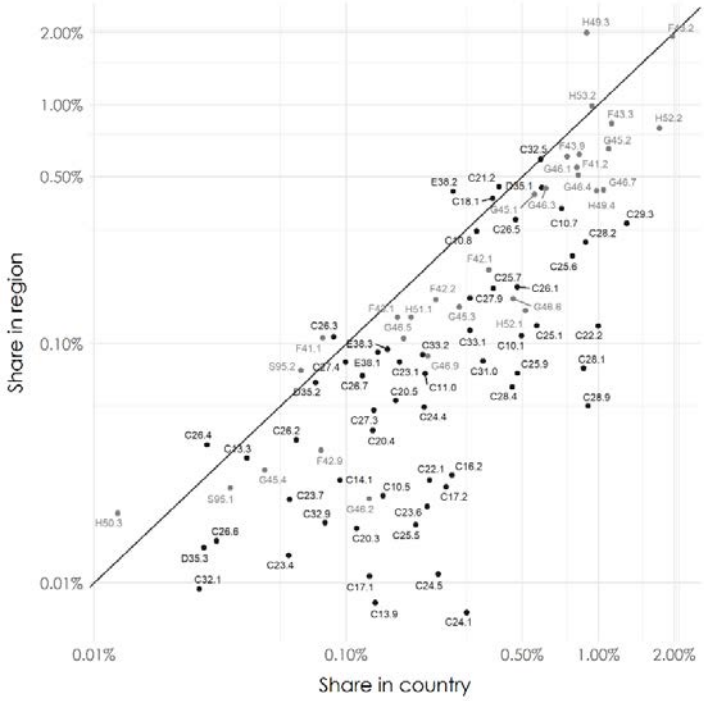
[21] Support activities for transportation, freight transport by road and removal services, warehousing and storage, other postal and courier activities, other passenger land transport.

Figure 1: Sector shares of productive activities (total Berlin metropolitan area).



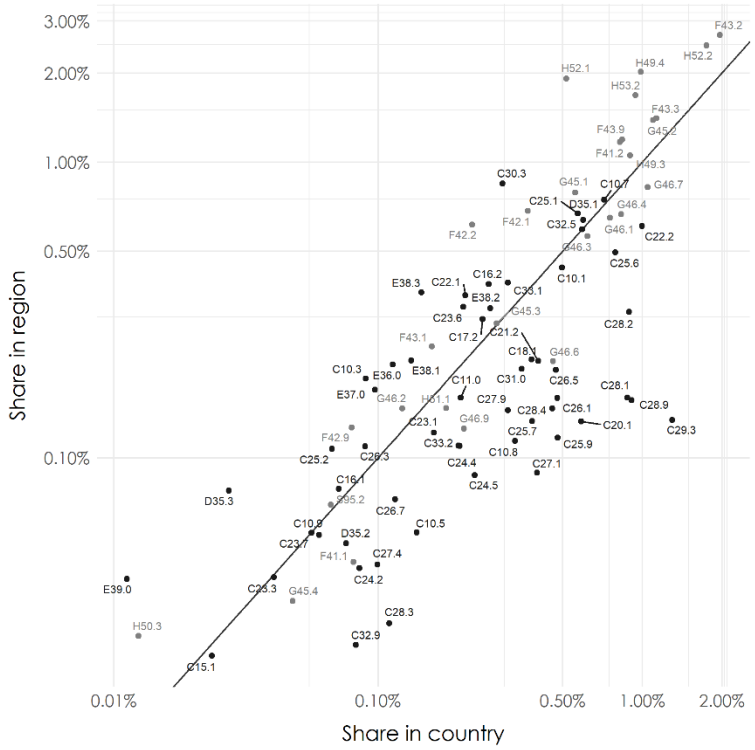
Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 2: Sector shares of productive activities (city of Berlin).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 3: Sector shares of productive activities (environs).



Source: Federal Employment Agency, BA, ESPON MISTA (2020). Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Table 3: Top 10 branches in terms of size (2019).

NACE	Name	Empl.	Share in %
Total metropolitan region			
F43.2	Electrical, plumbing and other construction installation activities	43808	2,12
H49.3	Other passenger land transport	36099	1,75
H52.2	Support activities for transportation	25483	1,23
H53.2	Other postal and courier activities	24131	1,17
F43.3	Building completion and finishing	20294	0,98
H49.4	Freight transport by road and removal services	17513	0,85
G45.2	Maintenance and repair of motor vehicles	17424	0,84
F43.9	Other specialised construction activities	15871	0,77
F41.2	Construction of residential and non-residential buildings	14622	0,71
G46.1	Wholesale on a fee or contract basis	12737	0,62

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Separate illustrations for the city and its environs are provided in Table A1 in the annex.

As a consequence of this structure of the subregions, also the entire Berlin metropolitan region is strongly focused on the logistics, construction and wholesale trade sectors within the production activities. The largest branch in terms of employment is “electrical, plumbing and other construction installation activities “and again all of the top 10 branches in terms of employment shares belong to the construction, logistics and wholesale trade sectors. In total the four logistics branches (“other passenger land transport”, “support activities for

transportation", "other postal and courier activities" and "freight transport by road and removal services") among these top 10 take 5% of total employment. The four construction branches ("electrical, plumbing and other construction installation activities", "building completion and finishing", "other specialised construction activities", "construction of residential and non-residential buildings") account for 4.5% of total employment. The two wholesale trade sector branches ("maintenance and repair of motor vehicles", "wholesale on a fee or contract basis") among these top 10 account for 1.5% of employment.

Table 4: Top 10 branches in terms of specialisation (location quotient, 2019).

NACE	Name	Empl.	LQ
Total metropolitan region			
H49.3	Other passenger land transport	36099	1,94
H50.3	Inland passenger water transport	433	1,69
E38.2	Waste treatment and disposal	8334	1,52
H49.2	Freight rail transport	1972	1,38
H53.2	Other postal and courier activities	24131	1,24
C26.3	Manufacture of communication equipment	2221	1,21
F42.2	Construction of utility projects	5627	1,20
H52.1	Warehousing and storage	12373	1,16
S95.2	Repair of personal and household goods	1552	1,13
E38.3	Materials recovery	3392	1,13

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Only industries with at least 100 employees are considered. Separate illustrations for the city and its environs are provided in Table A3 in the annex.

When considering the employment share of branches in the Berlin metropolitan region relative to the national averages (i.e., the location quotient, see table 3 and table A3 in the appendix) in particular the logistics sector is marked as heavily localized in the Berlin metropolitan area. Five of the ten most strongly localized branches in the Berlin metropolitan region belong to the logistics sector[22]. Some of these branches, however, have very low employment levels. In particular "Inland passenger water transport" having very low employment levels (below 500 employees).

Next to this, also relative specialisations can be found in utilities and services related to the circular economy ("waste treatment and disposal, "materials recovery", "repair of personal and household goods") as well as construction ("construction of utility projects"). Among the manufacturing branches only the "manufacture of communication equipment" belongs to the 10 most heavily localized production branches in the Berlin metropolitan region.

In general, there are, however, only few production branches that are localized in the city and even in those sectors, where there is a localization, this is not very high. Thus, only two of the

[22] These are "other passenger land transport", Inland passenger water transport", "freight rail transport", "other postal and courier activities" "passenger air transport", "and "warehousing and storage".

larger localized branches (i.e., “other passenger land transport”, and “waste treatment and disposal”)[23], have an employment share in the Berlin metropolitan region that is by more than 50% higher than in the national average (i.e. a localization coefficient of 1.5 or more) and for most other localized branches the localization quotient ranges between 1.1 and 1.3 (thus indicating a 10% to 30% higher employment share than in the national average).

This diversity applies slightly more strongly to the city of Berlin than to the environs. In the city only two branches (“other land passenger transport” and “waste treatment and disposal”), have an employment share that is more than 50% higher than the national average (i.e., a localization coefficient in excess of 1,5). Among these branches “other land passenger transport” includes both private (e.g., taxi drivers) and public (e.g., trams and bus services) transport such that both these branches are almost by definition localized in most urban regions. Interestingly, however, next to the specialisation on logistics, there are also a number of localized branches in the manufacturing sector. These, next to “printing and service activities related to printing”, include a number of high-tech and medium tech industries such as the “manufacture of consumer electronics”, “manufacture of communication equipment” and the “manufacture of pharmaceutical preparations” as well as some branches that are more related to small scale crafts (e.g., “repair of personal and household goods”).

Similar to the city of Berlin also the environs have a strong relative specialisation on logistics branches (“warehousing and storage”, “freight rail transport”, “freight transport by road and removal services”). In particular here the more land intensive branch of “warehousing and storage” has an employment share that is almost four times higher than the national average. The same also applies to some utilities (“remediation activities and other waste management services”, “steam and air conditioning supply” and “materials recovery) that, however, often have low overall employment numbers (below 500 employees) and some construction sector branches (“construction of utility projects”). Among the manufacturing sector only two branches (“manufacture of air and spacecraft and related machinery” and “processing and preserving of fruit and vegetables”) belong to the more localized branches.

3.3.2 Growth

In terms of employment growth in the Berlin metropolitan region over the period 2012 to 2019 branches in the logistics sector have been the fastest growing by far. Thus, employment in “warehousing and storage” as well as in “other postal and courier activities” has increased by almost a quarter over this time period. This reflects the substantial investments in this sector in the areas located just outside Berlin in recent years.

Besides this also the manufacturing sector, - starting from a rather low level – has shown healthy growth. Among the top 10 branches in terms of employment growth five belong to the manufacturing sector. Of these two belong to the consumer goods industries (“finishing of

[23] These branches are, however, localized, in most cities because they inter alia include private (e.g., taxis) and public (e.g., buses and trams) transport that is strongly concentrated in urban areas

textiles", "manufacture of dairy products") while the other four are high or medium-high tech branches ("manufacture of pharmaceutical preparations", "manufacture of pharmaceutical preparations", "manufacture of optical instruments and photographic equipment"). These branches at least in part profit from the start-up boom the city has experienced in recent years.

Table 5: Top 10 branches in terms of growth (2012-2019).

NACE	Name	Empl.	Growth p.a. in %
Total metropolitan region			
H52.1	Warehousing and storage	12373	24,95
H53.2	Other postal and courier activities	24131	24,53
C13.3	Finishing of textiles	552	9,58
G46.5	Wholesale of information and communication equipment	1695	8,89
C21.2	Manufacture of pharmaceutical preparations	8065	8,88
C10.5	Manufacture of dairy products	654	8,86
E37.0	Sewerage	1270	8,73
F41.1	Development of building projects	1854	8,34
C26.7	Manufacture of optical instruments and photographic equipment	1509	7,09
C28.4	Manufacture of metal forming machinery and machine tools	1795	6,74

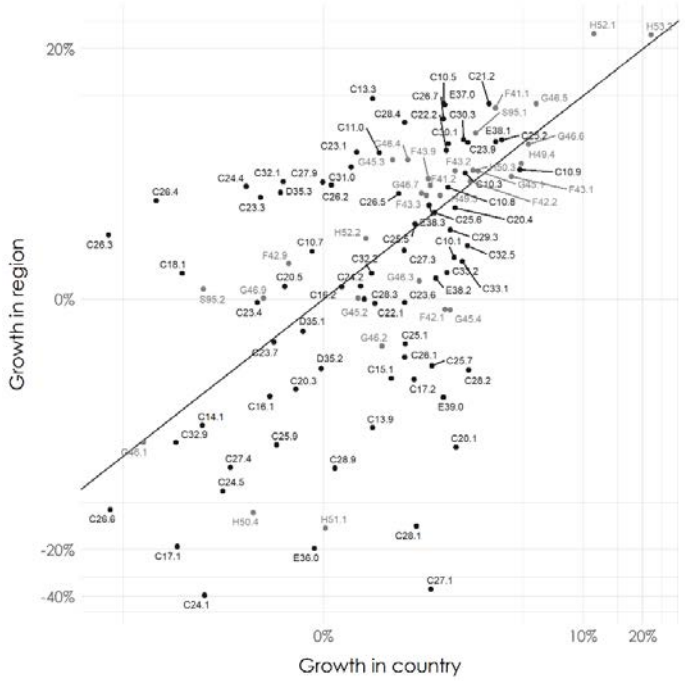
Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Only industries with at least 100 employees in 2017 are considered. Separate illustrations for the city and its environs are provided in Table A2 in the annex.

Again, these general trends apply to both the city of Berlin as well as to its environs. In both these subregions among the production branches "warehousing and storage" and "other postal and courier activities" grew the fastest. The only difference between the two subregions is that in the city of Berlin "other postal and courier activities" grew somewhat more rapidly than "warehousing and storage", while in the environs the opposite was the case.

Similarly, in both regions the majority of the other top ten growth branches in the production sector are in manufacturing of consumer goods and in high and medium-high technology manufacturing. In the city of Berlin in total five of the ten fastest growing branches are affiliated with manufacturing. Among these the "manufacture of dairy products", "finishing of textiles" and the "manufacture of beverages" can all be considered consumer goods industries, while the "manufacture of pharmaceutical preparations" and the "manufacture of metal forming machinery and machine tools" belong to the group of high and medium high-tech branches.

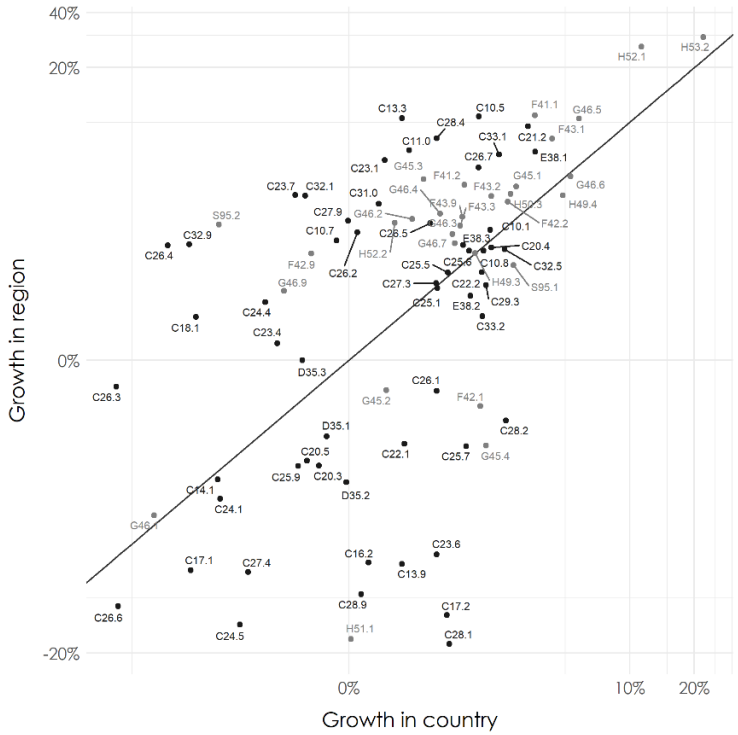
In the environs the focus of the fastest growing branches on the manufacturing sector is even stronger. Here seven of the 10 fastest growing branches in the production sector belong to the manufacturing sector. These include some consumption good industries ("manufacture of other food products", "manufacture of dairy products") and a larger set of high and medium-high technology sectors ("manufacture of optical instruments and photographic equipment", "manufacture of communication equipment", "manufacture of pharmaceutical preparations", "manufacture of plastics products").

Figure 4 : Growth of productive activities (total Berlin metropolitan area).



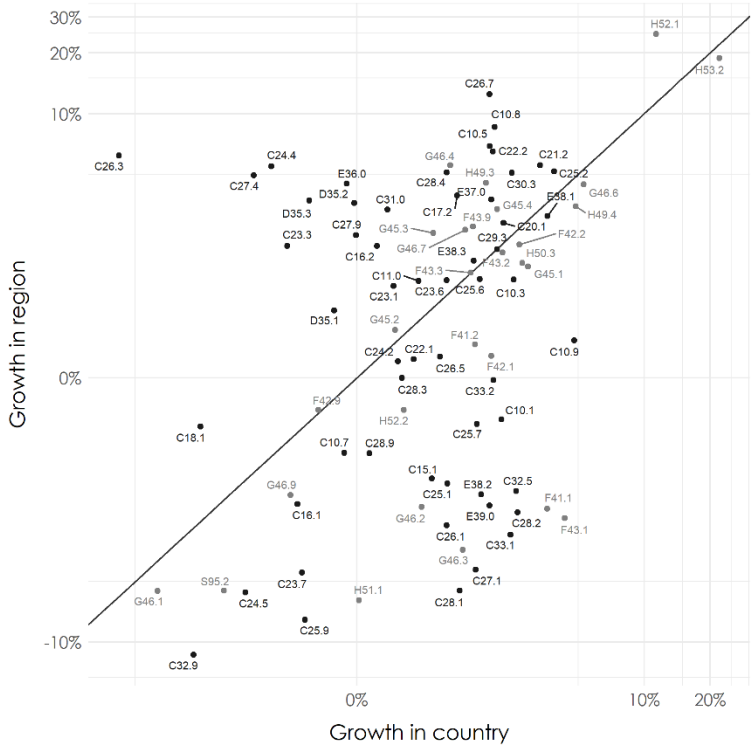
Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 5: Growth of productive activities (city of Berlin).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 6: Growth of productive activities (environs).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

In contrast to the city, however, these rapidly growing manufacturing branches are often still rather small in the Berlin environs. In Berlin among the top ten branches in terms of growth only the “manufacture of dairy products” and the “finishing of textiles” had less than 1000 employees in 2018. In the environs the same applied to the “manufacture of optical instruments and photographic equipment”, “manufacture of other food products”, “manufacture of dairy products”, “manufacture of communication equipment” and the “manufacture of basic precious and other non-ferrous metals.

Interestingly also only very few branches among the construction and wholesale trade branches, that have been shown to be of some relevance in terms of employment shares in both the city of Berlin and its environs, belong to the list of the fastest growing branches. In the city of Berlin as well as in the entire Berlin metropolitan region among these branches only the “wholesale of information and communication equipment” and the “demolition and site preparation” belong to the fastest growing sectors. In the environs the same applies only to the “wholesale of household goods.

3.4 SWOT profiles of productive activities

The diversity of the production sector in the Berlin metropolitan region also leads to knit networks of interrelated branches rather loosely in the city relative to the more industrial cities (for example Turin and Stuttgart) covered in the MISTA project. In this respect Berlin is more comparable to some of the capital cities analysed in the project (in particular Vienna).

Further given the localization of many logistics branches, also many of the most strongly embedded branches are in the logistics sector. This applies in particular to the environs of Berlin. In this region the four most tightly embedded branches into the overall economy are related to logistics (other postal and courier activities, support activities for transportation, freight transport by road and removal services) and one further logistics branch (other passenger land transport) belongs to the top 10 in terms of embeddedness. Next to logistics further well-connected clusters of branches in the production sector in the Berlin environs seem to exist in the construction sector ("construction of roads and railways", "demolition and site preparation", "construction of residential and non-residential buildings" and "other specialised construction activities") and, to a lesser degree, in utilities ("waste treatment and disposal", "waste collection").

Table 6: Top 10 branches in terms of embeddedness (2019).

NACE	Name	Empl.	Embed.
Total metropolitan region			
H51.1	Passenger air transport	2758	1,17
G46.5	Wholesale of information and communication equipment	1695	1,16
H49.2	Freight rail transport	1972	1,14
H50.3	Inland passenger water transport	433	1,14
F41.1	Development of building projects	1854	1,12
C10.7	Manufacture of bakery and farinaceous products	9619	1,04
H50.4	Inland freight water transport	147	1,03
D35.1	Electric power generation, transmission and distribution	10293	1,03
H53.2	Other postal and courier activities	24131	1,00
C26.3	Manufacture of communication equipment	2221	0,99

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Only industries with at least 100 employees are considered. Separate illustrations for the city and its environs are provided in Table A4 in the annex.

In the city of Berlin, the most deeply embedded branch is "wholesale trade of information and communication equipment"), but other than that also here a large number of logistics branches (passenger air transport, inland passenger water transport, freight rail transport) belong to the most deeply embedded branches. Similarly, as in the environs also some construction branches and utilities are closely connected to other branches in the city. This applies in particular to "demolition of buildings projects" and "electric power generation, transmission and distribution". In contrast to the environs, in the city there are, however also a number of embedded manufacturing branches in the city. These once more include some consumer goods industries ("manufacture of bakery and farinaceous products", "printing and service activities related to printing" and "manufacture of wearing apparel") as well as high and medium -high tech industries (e.g., manufacture of communication equipment).

As consequence of these patterns, logistics branches also feature most prominently among the well embedded branches in the total Berlin metropolitan region. Overall, six of the ten most

deeply embedded branches in the Berlin metropolitan area are in the logistics sector.[24] By contrast, the other four among the top ten embedded branches come from rather different sectors and include the "wholesale of information and communication equipment", "development of building projects", "manufacture of bakery and farinaceous products" and "electric power generation, transmission and distribution".

Table 7: Empirical SWOT Profiles for the total metropolitan region (2019).

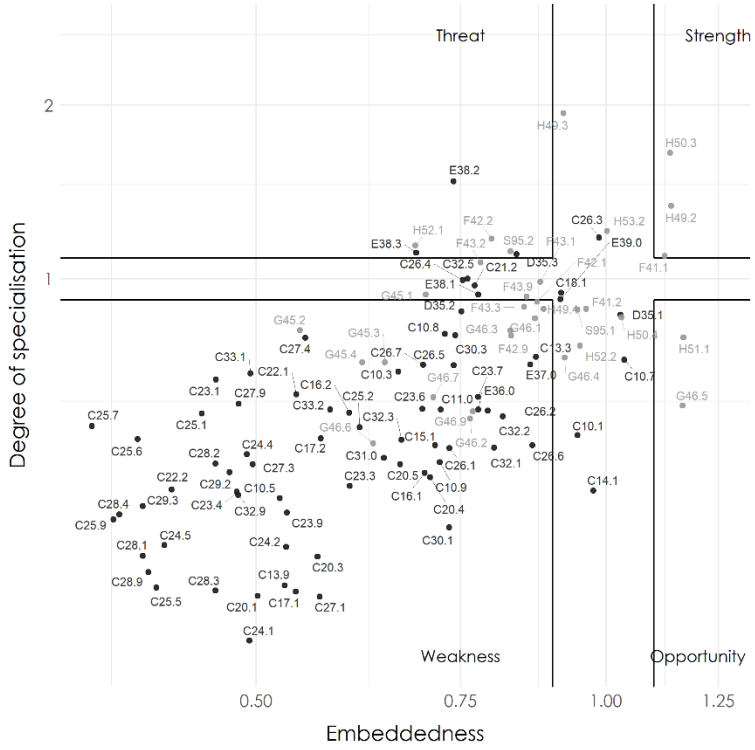
NACE	Name	Employment
Embedded and localized		
H50.3	Inland passenger water transport	433
H49.2	Freight rail transport	1972
F41.1	Development of building projects	1854
Embedded but not localized		
H51.1	Passenger air transport	2758
G46.5	Wholesale of information and communication equipment	1695
Localized but not embedded		
E38.2	Waste treatment and disposal	8334
F42.2	Construction of utility projects	5627
D35.3	Steam and air conditioning supply	631
S95.2	Repair of personal and household goods	1552
H52.1	Warehousing and storage	12373
E38.3	Materials recovery	3392

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Only industries with at least 100 employees are considered. Separate illustrations for the city and its environs are provided in Tables A5 to A7 in the annex.

Given the diverse sector structure of the Berlin metropolitan region there are also few localized and well embedded branches in this region that can be considered strongholds of the economy of the region. This is mainly due to the diversity of the city of Berlin, where only three branches, that in addition employ only a low number of employees, fulfil the double requirement that they be both well embedded and localised. One of these is in the logistics sector ("inland passenger water transport"), one in construction ("development of building projects") and one in manufacturing ("manufacture of communication equipment"). These branches in total employed slightly more than 3.500 workers in 2018. This thus suggests that from a perspective of technological development there are only few options for development of clusters based on existing strengths in the production sector of the city.

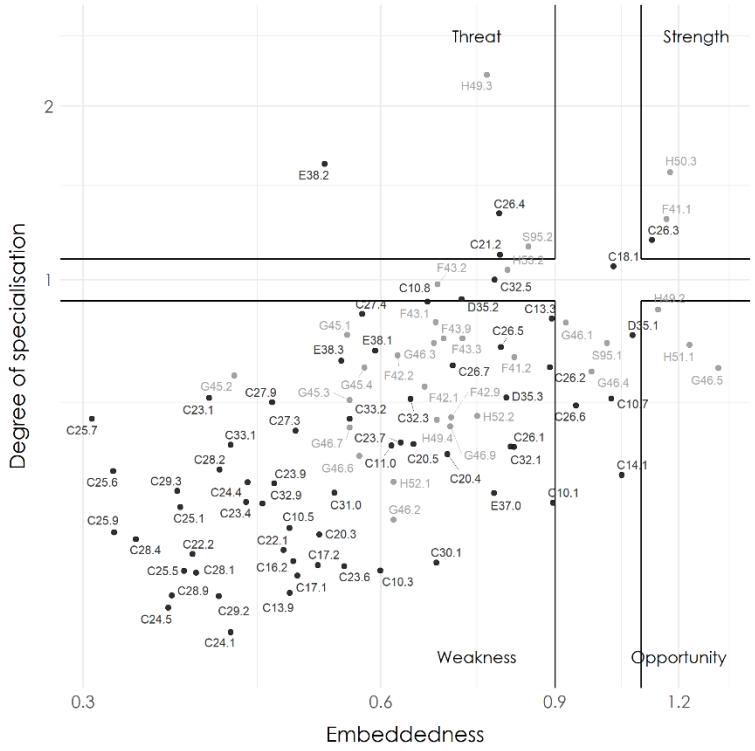
[24] These are „passenger air transport", "freight rail transport", "Inland passenger water transport", "Inland freight water transport "Other postal and courier activities

Figure 7: Empirical SWOT Profile (total Berlin metropolitan area).



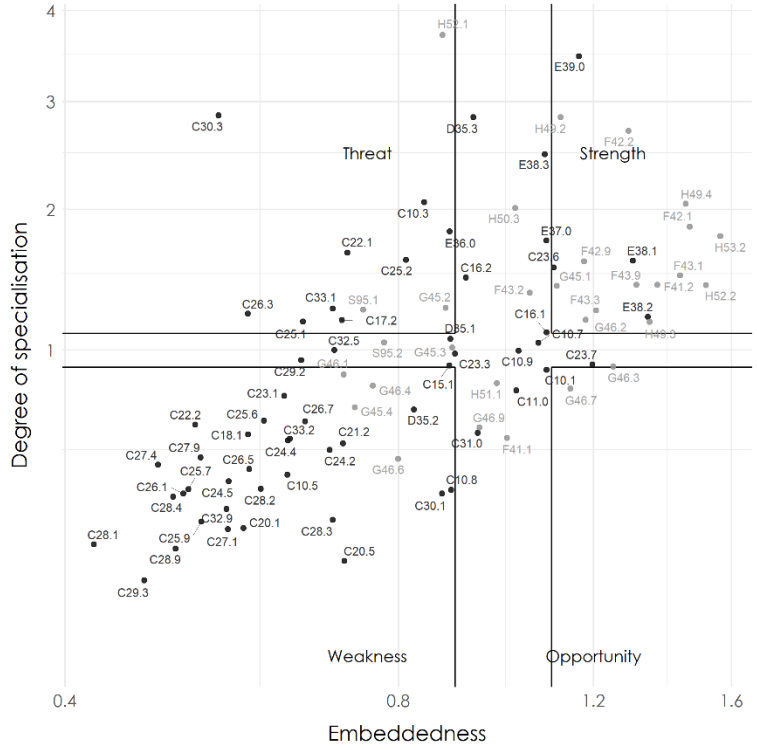
Source: Federal Employment Agency, BA, ESPON MISTA (2020); Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 8: Empirical SWOT Profile (city of Berlin).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations; Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure 9: Empirical SWOT Profile (environs).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

By contrast, in the Berlin environs the number of embedded and localized branches is longer and includes construction ("construction of utility projects", "construction of roads and railways", "demolition" and "construction of residential and non-residential building") and logistics ("freight rail transport", freight transport and removal services") branches a well as some utilities ("remediation activities and other waste management services and waste collection").

Interestingly and in contrast to many other metropolitan regions the list of embedded and localized branches does not increase substantially when considering the metropolitan region as a whole. In the total metropolitan region of Berlin there are only three embedded and localized branches that in total employ just over 3.800 persons. Of these branches two are in logistics ("inland water transport", "freight rail transport") and one is in construction ("development of building projects"). Therefore, while cooperation with the environs is important in other aspects of regional policy such as infrastructure policy, from a purely technological development perspective, cooperation with the environs of Berlin does not increase the existing strengths of the economy. This may be indication that the space of cooperation analysed is too small to provide substantial development perspectives.

Similar observations apply to the list of production branches that are embedded but not localized, which could be seen as paths for the development of new strengths in related productions in the Berlin metropolitan region. This includes only a few mostly small, branches. Thus, in the city of Berlin only three branches ("freight rail transport", "passenger air transport",

"wholesale of information and communication equipment"), that employ around 4.500 employees fall into this category. In the environs this applies to only one branch (other specialised wholesale) with 4.418 employees and in the total metropolitan to two branches (passenger air transport, wholesale of communication equipment) with 1.608 employees.

In contrast to this, the list of localized but not embedded branches is longer and includes branches with substantially higher employment levels in both the city of Berlin and its environs. This list also includes a fair number of manufacturing branches. In the city of Berlin "other passenger land transport" "manufacture of consumer electronics", "repair of personal and household goods", "manufacture of pharmaceutical preparations" and "waste treatment and disposal" all share the feature of being localized but little embedded. The total employment in these branches is around 46.000 employees. In the environs of Berlin, the same list of branches includes a total of ten branches of which six[25] belong to the manufacturing sector. in total these branches employ around 30.000 employees.

3.5 Main take-aways

- In terms of sector structure Berlin is highly service oriented. Furthermore, within the production sector there is a high diversity across branches with the most localized ones often being in the logistics sector. Interestingly this feature applies to both the city of Berlin as well as its environs.
- Despite the low employment share of the production sector some of the production branches analysed in this chapter have shown high employment growth in the years from 2012 to 2019. This applies in particular to some logistics branches such as "warehousing and storage" as well as "other postal and courier activities" that - due to the globalisation of value chains and E-commerce - experienced substantial investments in recent years and a markable increase in their employment levels by over a quarter. It also applies to some smaller consumer goods and high and medium-high technology manufacturing branches, whose employment levels are, however, still low.
- Following the employment structure, the network of production sector branches in both the city of Berlin and also in the Berlin metropolitan region is also very diverse, in the sense that there are few strongly connected clusters of production branches. In consequence the number of both localized and well embedded as well as non-localized but embedded branches in the region is rather low. The central strongholds of the Berlin economy within the production sector seem to be in the logistics sector. In addition, the knowledge intensive business services that are not included in the current study are a central stronghold of the economy.
- By contrast, Berlin has a larger number of localized but not embedded branches and an even larger number of branches that are not localized and not embedded. This list also includes a fair number of manufacturing branches and in total around 46.000 employees work in such branches.
- Interestingly considering the entire metropolitan region of Belin does not increase the embeddedness of the region. As for the city of Berlin also in the total metropolitan region

[25] These include "processing and preserving of fruit and vegetables", "manufacture of air and spacecraft and related machinery", "manufacture of tanks, reservoirs and containers of metal", "manufacture of rubber products", "repair of fabricated metal products, machinery and equipment", "manufacture of articles of paper and paperboard"

only three branches employ just over 3.800 persons. Of these branches two are in logistics (inland water transport, freight rail transport) and one is in construction (development of building projects).

4 Outcomes of the future workshop

4.1.1 Workshop structure

At the occasions of a “future workshop” held in October 2020 participants discussed the results of the MISTA project and potential future development perspectives. The workshop was intended as an exploratory and self-reflective process for MISTA’s seven stakeholder cities to review how their planning policy, plans, regulation and technical capacity reflect their ambitions in terms of research from the MISTA project and was conducted in each of the seven stakeholder cities with each workshop following a similar structure and containing similar ambitions, including:

- Helping to expose motivations and priorities for each of the cities.
- Seeking feedback on how research could be applied to decision making processes.
- Exploring the relevance of the Inspirational Cases, based on a shortlist of 27 cases.
- Showcasing how to facilitate stakeholder co-creation based on the outcomes of the MISTA project and to create ‘Metropolitan Industrial Spatial Strategies’ related to ‘Economic Sprawl’.

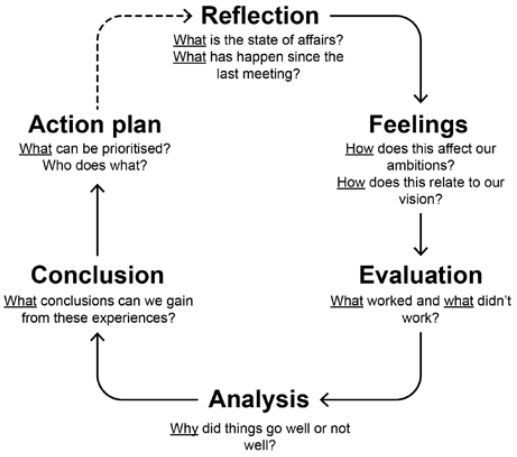
The workshops were not expected to generate all-embracing results but create conditions for collaboration, exchange and expose which issues are the most relevant to each city. The workshops also provided participants with a range of tools that could help to facilitate the use of the MISTA research for discussion and collaboration in the longer term.

Workshop program

Knowledge transfer can depend on a number of factors. This could include the technical skills of those involved, the institutional capacity to interpret and apply the knowledge to the local cultural context, the planning environment, the economic conditions and the political landscape. As noted in the main MISTA report, the public sector at a city and metropolitan level across Europe has rarely been involved in shaping urban production networks. To be more actively involved in shaping the local (production) economy would require public authorities adopting new knowledge, developing new forms of collaboration (both inter-institutional but also outside the public sector) and in some cases new skills. Organisational change management offers a useful pathway. A development process where challenges are unclear, where shared meaning is required and where the end is poorly defined, can benefit from a reflexive approach based on co-creation and learning, what has been referred to as a ‘community of practice’.

The MISTA futures workshop was based on ‘experiential learning’ methodology developed by Graham Gibbs 1988. The program was built around a six-step process, illustrated in the diagram below. The ambition of using this methodology was to bring together local actors within a community of practice and based on experiential learning, while showcasing a methodology that could be applied after the MISTA project was completed.

Figure 10: The two axes that define the policy scenarios.



Source: MISTA adaptation, based on Graham Gibbs 1988.

4.1.2 Workshop structure for Berlin

Due to the limitations imposed by COVID-19, the event was conducted online. This may have changed the conventions of exchange and the public engaged, but also provided a more curated context for discussion.

The Berlin workshop took place on the 29th of October 2020 with local actors for 2.5 hours. The event was hosted by Elke Plate and Philipp Perick (Senatsverwaltung für Stadtentwicklung und Wohnen). The event included ten attendees from: IHK Berlin (Berlin's chamber of industry and commerce), Unternehmensnetzwerk Motzener Straße (an industrial business park), Complan (inter-communal cooperation), Büro für Wirtschaftsförderung Neukölln (Office for Economic Development Neukölln) and Senatsverwaltung für Wirtschaft, Energie und Betriebe (Berlin's Senate Department for Economy, Energy and Enterprises).

Following the workshop methodology above, the first step (reflection), began with a presentation of the MISTA's analysis of the city (see the report, above). The second and third steps (Feelings & Evaluation) were combined due to time constraints and explored a generic SWOT analysis of the place of the production sector in Berlin. The fourth step (Analysis) involves the discussion of three problem statements. The fifth step involved presentation of inspirational cases relevant to Berlin. The final step (Action plan) was left for general discussion.

4.1.3 Statements

In the Berlin workshop statements were used to generate discussion in the 'Analysis' step of the workshop. The following statements were tabled for discussion which give an indication of the kind of issues being prioritised in Berlin at a planning level.

1. The bottleneck in the supply of commercial space is not its existing scope, but its activation.

- How can we measure and evaluate the availability of space, what role do quantity and efficiency play?
- How can unused or underused potential be activated?

- How can owners become space activators? How can their soil management logic be used for the goal of securing land for productive uses?

2. The goal of a resilient city also requires a diversified economic structure. Mixed-use locations and quarters with manufacturing industry are a particularly sustainable approach to achieving this goal.

- In which locations or projects is Berlin already exemplary in this respect?
- How can a good coexistence of different uses - apart from planning law control and established building solutions - be supported?
- What role can local networks play here?
- How can Berlin's special locational advantage, its proximity to science and research, be integrated?

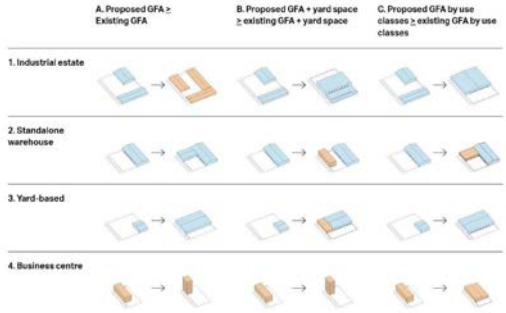
3. Berlin's ambitious climate and environmental protection goals will hardly be achievable without considering the use of resources in the manufacturing industry and its waste. Environmental services will therefore become an even more important task for the future.

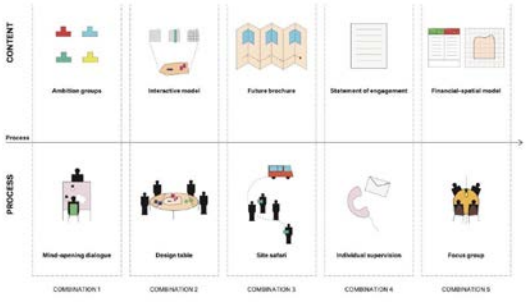
- How can the conversion to a circular economy succeed, what potential is there for companies?
- How can Berlin assume a pioneering role? What role can proximity to science and research play in this?
- Which approach is particularly promising: a sector-related or spatial (areas/locations) approach or a completely different approach?

4.1.4 Inspirational cases selected

Five inspirational cases were selected for the workshop which provide an indication of the kind of interventions that were considered a priority.

Figure 11: The inspirational cases presented and discussed within the workshop.





Industrial intensification and co-location study (London)

Berlin's focus on its own territory for development and the pressure on existing industrial land for other uses has meant that pressure is developing to use existing land more effectively. London's intensification study provides Berlin with a good example of the kinds of guidelines and development opportunities to apply locally.

Lageweg (Antwerp)

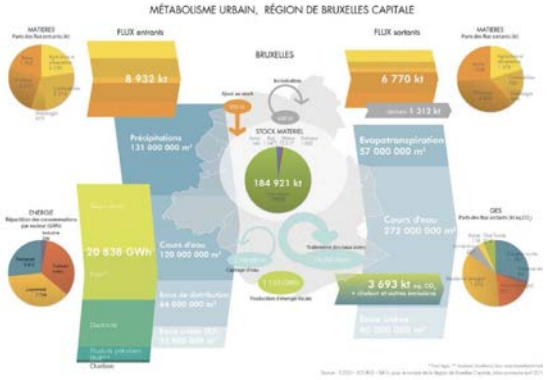
Berlin contains a relatively large amount of industrial, yet most remains in private hands. While this puts public authorities in a weak position it also provides conditions for co-creation and bottom-up planning. The Lageweg offers a successful example of process management.

East End Trades Guild & Guardians of the Arches (London)

Industrial and productive activities are often in a weak position compared to housing. Coalitions of businesses can help provide a clearer indication of the kinds of challenges and opportunities facing local businesses.

RDM Campus (Rotterdam)

The RDM site links education and entrepreneurship under the same roof and encourages collaboration between people with technical and theoretical expertise. This kind of space could be an appealing investment opportunity for Berlin.



The Brussels Circular Economy Plan

Berlin has an industrial policy, yet it is currently very market oriented. A mission driven approach, like Brussels' circular economy plan, offers a pathway for building other regional scale challenges to combine business, the public sector and research in dealing with challenges faced by the city.

Source: ESPON MISTA (2020)

4.1.5 Outcomes and discussion

The discussion amongst the stakeholders raised concerns regarding the difference between planning and plans and how urbanism processes function in practice. Feedback from the workshop stressed the concern of the power of housing over industrial activities. Residential areas are highly protected in German urban areas, which means that even long-established productive activities can be heavily impacted by new housing projects. One serious bias favouring gentrification and rezoning is that districts do not get income from businesses, but they do from housing.

Table 8: Results of the SWOT analysis.

Strengths ▪ Strong industrial heritage. ▪ Strong infrastructure and highly connected both nationally and internationally. ▪ Despite real-estate pressure, high level of manufacturing remains in the city (8% of GDP) comparative to other large European urban centres. ▪ The city is both regional and local public authority, streamlining some level of bureaucracy. ▪ Municipal neighbourhood forum (Kommunales Nachbarschaftsforum – e.V. - KNF) at the scale of the metro area. ▪ Existing networking and clusters of research and production. ▪ Joint State Planning Department linking Berlin and Brandenburg.	**Strengths** ▪ Strong industrial heritage. ▪ Strong infrastructure and highly connected both nationally and internationally. ▪ Despite real-estate pressure, high level of manufacturing remains in the city (8% of GDP) comparative to other large European urban centres. ▪ The city is both regional and local public authority, streamlining some level of bureaucracy. ▪ Municipal neighbourhood forum (Kommunales Nachbarschaftsforum – e.V. - KNF) at the scale of the metro area. ▪ Existing networking and clusters of research and production. ▪ Joint State Planning Department linking Berlin and Brandenburg.
Opportunities ▪ Berlin has both local and regional powers. ▪ Urban Development Plan (UDP) Economy identifying 40 industrial production areas to be safeguarded and 11 “Places of Future” to be developed and branded - using this as a mandate ▪ Growing relations between Berlin and Brandenburg, including the innoBB 2025 strategy. The Urban Development Plan (UDP) Economy could move over the regional border. ▪ Area management: an opportunity to stimulate business ecosystems. ▪ Attracting businesses that are prepared to produce within the region of Brandenburg, with headquarters in the city in order to link to research and innovation and capital (e.g., Tesla). ▪ New land ownership models, e.g., community land trust.	**Threats** ▪ Planning complexity and slow capacity for public authorities to respond to the needs of businesses. ▪ Rising land prices. Pressure of the real estate market to produce housing (particularly targeting industrial land). ▪ Availability of space: the lock-in effect makes it difficult for companies to grow or shrink. Particularly challenging for start-ups moving into production and established businesses looking for more affordable or larger sites. Industrial area managements: poor financing for a promising service. ▪ Limited financial resources for the public sector to support companies.

Source: ESPON MISTA (2020).

Planning does not reflect the reality of 21st century production processes. Due to the location in Berlin, many businesses involve design and prototyping stages that take advantage of the local expertise and high-skilled labour. Yet planning legislation is inflexible for research and development, design and production related services. On the other hand, there is a concern that some areas contain activities that do not fit in. Stakeholders encouraged a clearer definition of what kinds of activities should happen on specific sites, more flexibility in the kinds of activities (such as design, so long as they are complementary to a larger vision), faster approval

of plans (which currently take years) and stronger protection and policing to avoid fragmentation.

Berlin does have financing to purchase industrial land. Recommendations were made to start small: mixing crafts with the social economy. Industrial land could be far more effectively used, but this would require assistance and stimulation.

A limitation of metropolitan scale planning is that there is no combined strategy with Brandenburg. Despite very detailed plans, the tension between industrial land uses and housing are further agitated by the local governments in Brandenburg that disregard regional plans, use legal battles and court procedures as a planning instrument.

Finally based on the results of the workshops, and the analysis the MISTA team conducted a SWOT analysis for berlin is summarized in table 8.

5 Annex: Further details on the methodology of the SWOT analysis used

5.1 Detailed description of the methodology

Although a conclusive and applicable concept for an evaluation of the development potential of the individual branches in the region within the framework of an empirical SWOT analysis is available as described in section Chapter 4.1 of the interim report, its implementation requires a clear (and evidence-based) idea of the branches with which a focal branch is technologically or cognitively "related". Several approaches have been developed in the literature to identify this (cognitive) "branch proximity".[26] However, most of them are only able to identify proximity relationships within the manufacturing sector or within the service sector, which makes the unsuitable for the present project. For this reason, the present analysis relies on an approach by Neffke and Henning (2013) which attempts to derive proximity from flow data between branches of the entire spectrum of branches across economic sectors. Technological or cognitive "proximity" of branches is revealed from labour mobility between branches, which is central to knowledge spillovers, assuming that job changes occur primarily between jobs with similar skill requirements. This is because human capital of the workforce is highly job-specific, so that individuals (necessarily) lose part of their human capital when they move to a branch in which they cannot or can hardly make use of their previously accumulated (job- or branch-specific) knowledge (Neal, 1995; Parent, 2000). Such job changes between cognitively distant branches are rather unlikely. Rather, employees prefer to switch between branches that share a common knowledge base (i.e., are technologically or cognitively related to each other) and therefore need workers with similar skills, so that the employees can transfer a large part of their human capital when changing jobs between branches (and thus avoid losses of human capital and therefore income).[27]

Thus, the degree of cognitive or technological relatedness between two branches can be deduced from the probability of labour flows between these branches. Of course, this requires complete information on all job changes between branches at a very disaggregated sectoral level. Such data is provided by the results of a major research project conducted by the Institute for Employment Research (IAB) in Germany (Neffke et al., 2017A, 2017B), which examined labour flows between branches at a highly disaggregated level on the basis of the IAB dataset on employment history (BeH)[28] in order to define technologically or cognitively "close" branches

[26] For a more detailed description of these approaches and their methodological advantages and disadvantages see Firgo and Mayerhofer (2018).

27 An empirical confirmation of this hypothesis is provided by Neffke et al. (2017A) for Germany. They show that job changes between branches are restricted to a limited spectrum of target branches that are cognitively "related" to the respective branch of origin.

28 In principle, the results were calculated at the 4-digit level of economic activities, but for our purposes they were aggregated to the level 3 branches. We are very grateful to Anne Otto of IAB Nuremberg for providing the data and additional processing for the purposes of our analysis. The BeH data set (for a more detailed description see Bender et al., 2000) represents a complete survey. The employee history contains comprehensive personal information on all employees and companies in Germany subject to

for Germany (referred to here as "skill-relatedness"). The application of the labour-flows between branches obtained for Germany to regions of other countries seems justified. It can be feasibly assumed that branches (groups) that prove to be technologically or cognitively "close" or "skill-related" in Germany on the basis of inter-sectoral labour market flows at the level of NACE 3-digit branches, will be so in other highly developed parts of Europe as well: In fact, it can be rather ruled out that the same NACE 3-digit branches in Germany and regions in Austria, Norway or (Northern) Italy - that are subject to the present analysis - as regions with very similar levels of economic and technological development, differ substantially from each other in terms of production technology, qualification structure, input-output interdependencies etc., such that they would require systematically different knowledge bases.

We therefore use the matrix of branch-relatedness obtained from intersectoral job changes in Germany and the resulting sectoral connections for the analysis of the stakeholder city regions of the project. IAB distinguishes a total of 265 branch groups at the NACE 3-digit level. This means that a symmetrical matrix can be used to map a total of more than 70,000 target-source relationships between branches. For each of these bilateral relations a "skill-relatedness" index (*SRij*) is formed, which depicts the relative magnitude of the respective flow of labour between two branches i and j as a measure of their "skill-relatedness". The basic idea here is that comparatively "large" labour flows between two branches are an indication that workers from branch i tend to move to branch j without any problems and can reuse their knowledge or skills from the old branch i quite easily. In this case the pair of branches under consideration can be qualified as cognitively/technologically "close" (or "skill-related").

What is meant by "comparatively large": In addition to their cognitive proximity, other factors are responsible for the extent of job changes between two branches, especially their size, but also their dynamics, wage levels or similar. An observable bilateral labour flow can thus be considered "relatively large" (and only then) if the number of job changes between the two branches is greater than would have been expected taking all the factors mentioned into account. Consequently, the "skill-relatedness" index compares the actual number of job changes measured with those that would have occurred if job changes between the two branches (given the characteristics of the branch) had been purely random. This (in the case of random changes) "expected" labour flows thus represents the benchmark for the classification of the observed labour flows. It can be easily calculated based on probability theory (cf. Otto et al., 2014).

Specifically, the "skill-relatedness" indicator as a measure of the cognitive "proximity" between two branches i and j is thus denoted as

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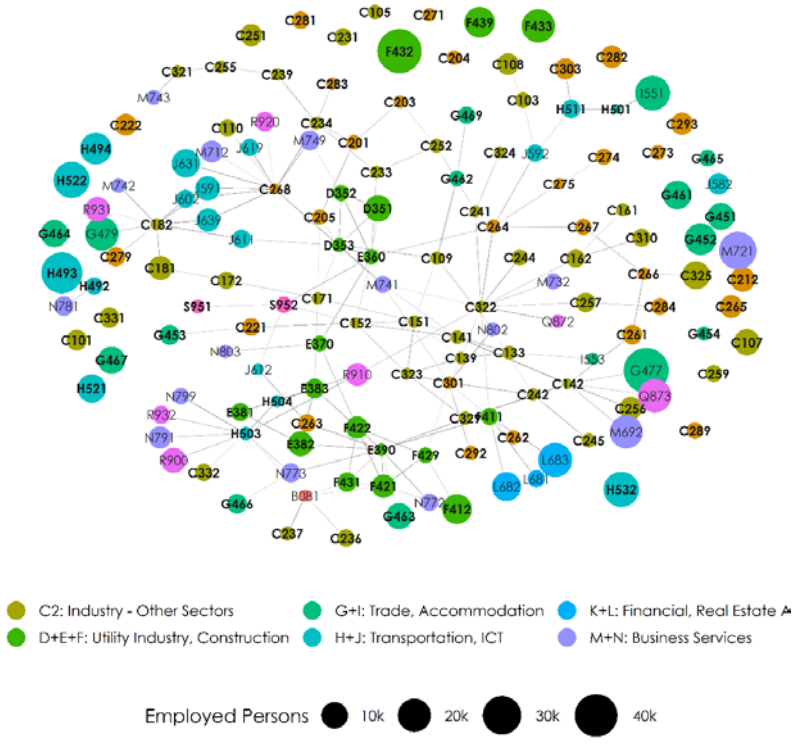
social insurance contributions as of 30 June each year. Information on employees and companies can be linked by means of anonymous personal and company numbers, so that on this basis (also) changes of job of employees can be identified.

Equation *(3)* $SR_{ij} = \frac{F_{ij}}{\hat{F}_{ij}}$,

where F_{ij} denotes the observed job changes between branches i and j, and $\hat{F}_{ij}$ denotes the expected job changes between i and j. If this "skill-relatedness" index is > 1, the actual flows between the two branches are greater than would be expected in the case of purely random job entries and exits, which means that the pair of branches can be regarded as technologically or cognitively "related" or "skill-related". With index values < 1, on the other hand, job changes between the two branches are less frequent than would be expected, and a technological or cognitive relatedness obviously is not high in this case.[29] On the basis of the matrix of these 70,225 indicator values for the 265 branch groups of the NACE classification (level 3) it is now possible to represent the entire network of cognitively or technologically "related" branches and to use it subsequently for the calculation of the embeddedness (see above) as part of the empirical SWOT analysis for the individual branches in each stakeholder region.

5.2 Network of branches

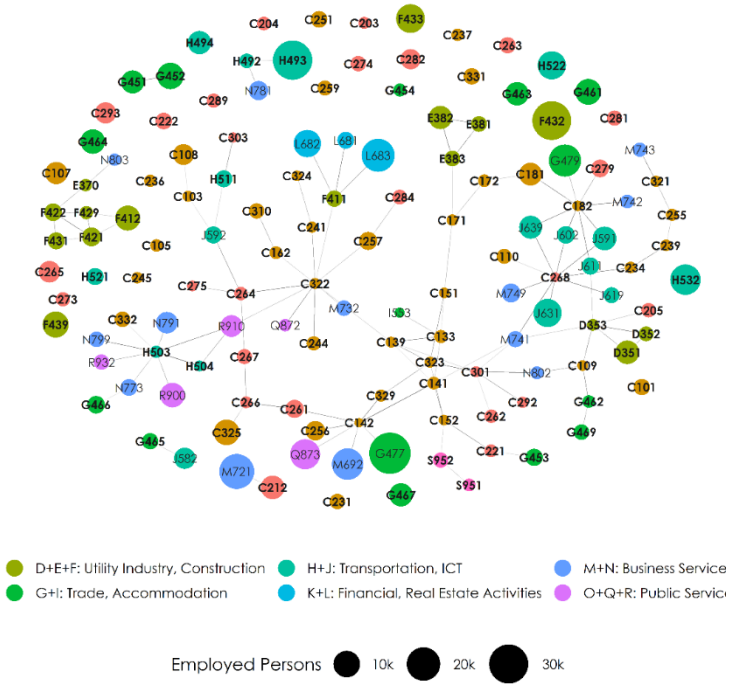
Figure A1: Network of branches (total Berlin metropolitan area).



Source: Federal Employment Agency, BA, network structure based on Neffke et al. (2017B), ESPON MISTA (2020) calculations. For illustrative purposes, only NACE 3-digit branch groups marking productive activities (in bold) and non-productive activities with strong links to productive activities with at least 100 employees are displayed.

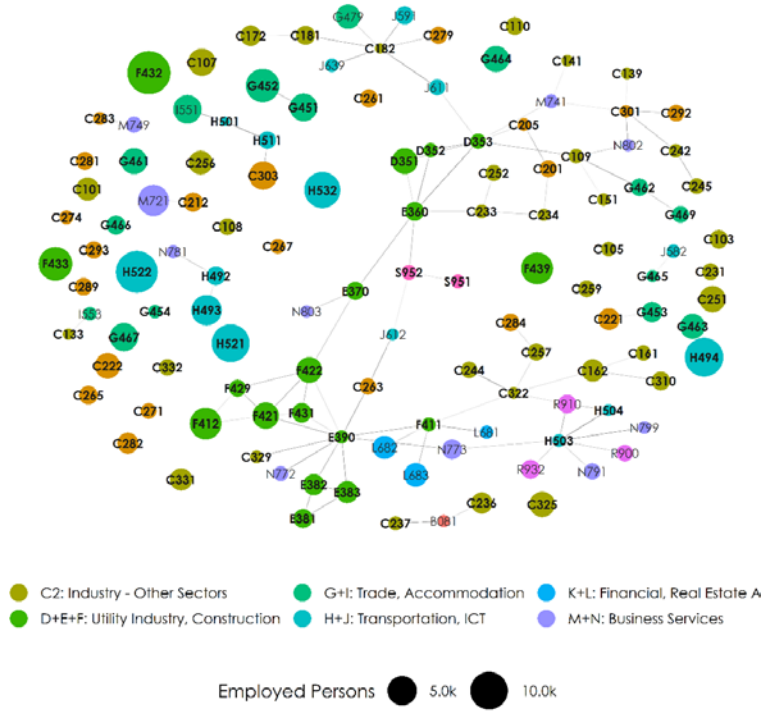
[29] In the further analysis, a normalized "skill-relatedness" index is used, which assumes values between -1 and +1. Positive values thus indicate cognitive proximity, whereas negative values do not indicate such proximity.

Figure A2: Network of branches (city of Berlin).



Source: Federal Employment Agency, BA, network structure based on Neffke et al. (2017B), ESPON MISTA (2020) calculations. For illustrative purposes, only NACE 3-digit branch groups marking productive activities (in bold) and non-productive activities with strong links to productive activities with at least 100 employees are displayed.

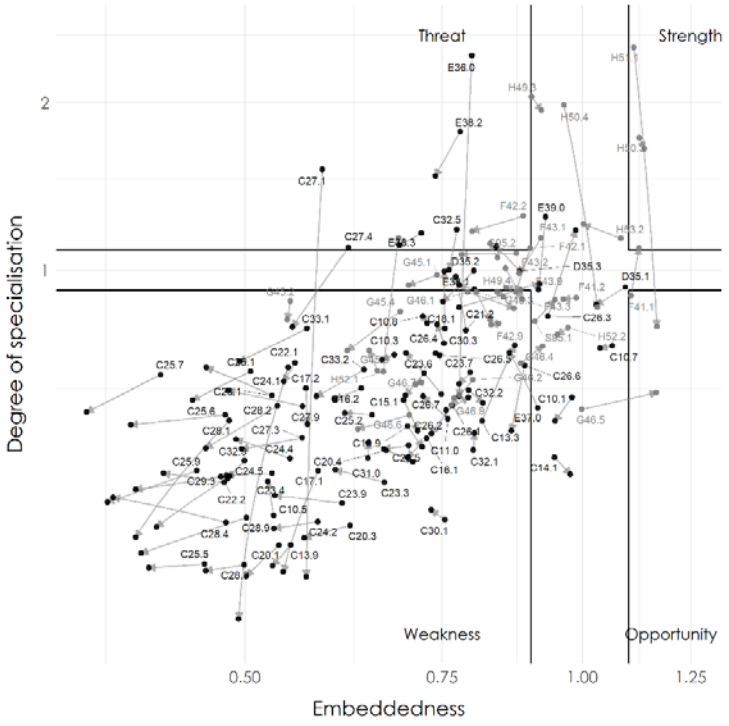
Figure A3: Network of branches (environs).



Source: Federal Employment Agency, BA, network structure based on Neffke et al. (2017B), ESPON MISTA (2020) calculations. For illustrative purposes, only NACE 3-digit branch groups marking productive activities (in bold) and non-productive activities with strong links to productive activities with at least 100 employees are displayed.

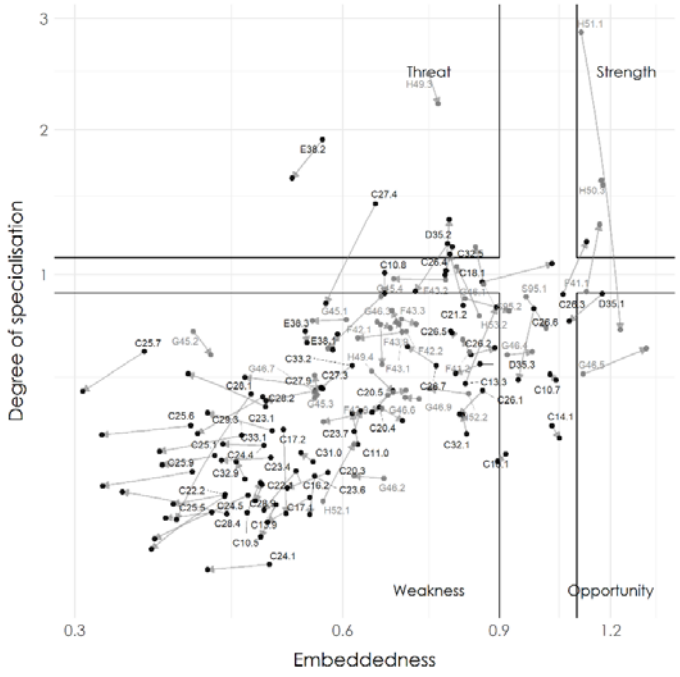
5.3 A dynamic perspective on the SWOT profiles

Figure A4: Dynamic of the SWOT Profile (total Berlin metropolitan area).



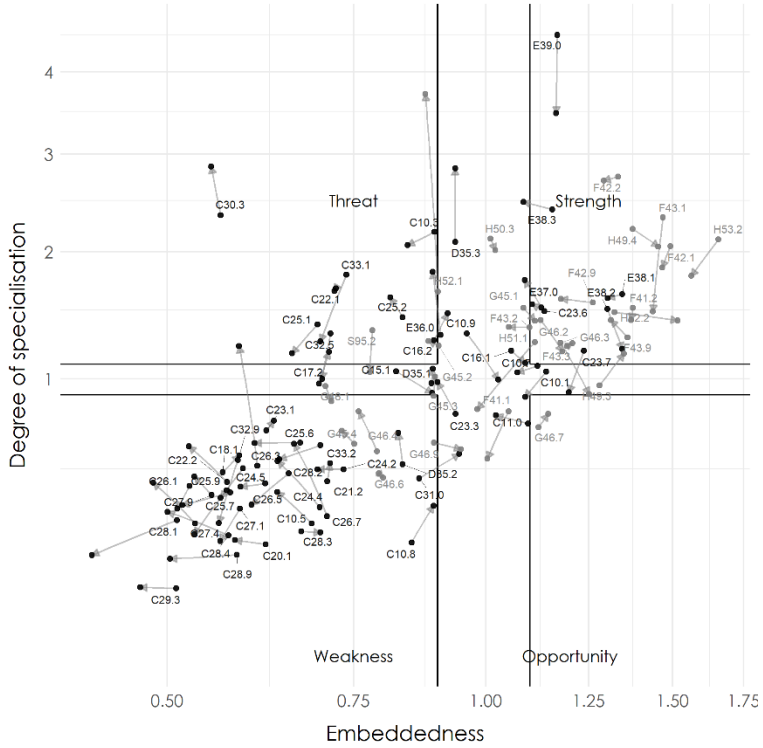
Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure A5: Dynamic of the SWOT Profile (city of Berlin).



Source: Federal Employment Agency, BA ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

Figure A6: Dynamic of the SWOT Profile (environs).



Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. Industry (service) activities in black (grey). For illustrative purposes only branches with at least 100 employees are displayed. For NACE codes and branches see Table A8 in the annex.

5.4 Top 10 Tables for Subregions

Table A1: Top 10 branches in terms of size (2019).

NACE	Name	Empl.	%
City of Berlin			
H49.3	Other passenger land transport	30440	1,99
F43.2	Electrical, plumbing and other construction installation activities	29382	1,92
H53.2	Other postal and courier activities	15096	0,99
F43.3	Building completion and finishing	12743	0,83
H52.2	Support activities for transportation	12172	0,80
G45.2	Maintenance and repair of motor vehicles	9978	0,65
F43.9	Other specialised construction activities	9471	0,62
G46.1	Wholesale on a fee or contract basis	9259	0,61
C32.5	Manufacture of medical and dental instruments and supplies	9044	0,59
F41.2	Construction of residential and non-residential buildings	8345	0,55
Environs			
F43.2	Electrical, plumbing and other construction installation activities	14426	2,69
H52.2	Support activities for transportation	13311	2,48
H49.4	Freight transport by road and removal services	10842	2,02
H52.1	Warehousing and storage	10270	1,91
H53.2	Other postal and courier activities	9035	1,68
F43.3	Building completion and finishing	7551	1,41
G45.2	Maintenance and repair of motor vehicles	7446	1,39
F43.9	Other specialised construction activities	6400	1,19
F41.2	Construction of residential and non-residential buildings	6277	1,17
H49.3	Other passenger land transport	5659	1,05

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations.

Table A2: Top 10 branches in terms of growth (2012-2019).

NACE	Name	Empl.	%
City of Berlin			
H53.2	Other postal and courier activities	15096	29,32
H52.1	Warehousing and storage	2103	26,09
F41.1	Development of building projects	1616	10,93
C10.5	Manufacture of dairy products	354	10,77
C13.3	Finishing of textiles	508	10,53
G46.5	Wholesale of information and communication equipment	1608	10,49
C21.2	Manufacture of pharmaceutical preparations	6924	9,51
C28.4	Manufacture of metal forming machinery & machine tools	1007	8,17
F43.1	Demolition and site preparation	1969	8,15
C11.0	Manufacture of beverages	1146	7,01
Environs			
H52.1	Warehousing and storage	10270	24,73
H53.2	Other postal and courier activities	9035	18,83
C26.7	Manufacture of optical instruments and photographic equipment	388	12,51
C10.8	Manufacture of other food products	612	8,58
C10.5	Manufacture of dairy products	300	6,90
C22.2	Manufacture of plastics products	3263	6,48
C26.3	Manufacture of communication equipment	587	6,21
C21.2	Manufacture of pharmaceutical preparations	1141	5,55
G46.4	Wholesale of household goods	3578	5,53
C24.4	Manufacture of basic precious and other non-ferrous metals	588	5,47

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees in 2019 are displayed.

Table A3: Top 10 branches in terms of specialisation (location quotient, 2019).

NACE	Name	Empl.	LQ
Total metropolitan region			
H49.3	Other passenger land transport	36099	1,94
H50.3	Inland passenger water transport	433	1,69
E38.2	Waste treatment and disposal	8334	1,52
H49.2	Freight rail transport	1972	1,38
H53.2	Other postal and courier activities	24131	1,24
C26.3	Manufacture of communication equipment	2221	1,21
F42.2	Construction of utility projects	5627	1,20
H52.1	Warehousing and storage	12373	1,16
S95.2	Repair of personal and household goods	1552	1,13
E38.3	Materials recovery	3392	1,13
City of Berlin			
H49.3	Other passenger land transport	30440	2,21
E38.2	Waste treatment and disposal	6616	1,63
H50.3	Inland passenger water transport	299	1,58
C26.4	Manufacture of consumer electronics	576	1,34
F41.1	Development of building projects	1616	1,31
C26.3	Manufacture of communication equipment	1634	1,20
S95.2	Repair of personal and household goods	1180	1,16
C21.2	Manufacture of pharmaceutical preparations	6924	1,12
C18.1	Printing and service activities related to printing	6192	1,06
H53.2	Other postal and courier activities	15096	1,05
Environs			
H52.1	Warehousing and storage	10270	3,72
E39.0	Remediation activities and other waste management services	209	3,48
C30.3	Manufacture of air and spacecraft and related machinery	4542	2,86
D35.3	Steam and air conditioning supply	416	2,84
H49.2	Freight rail transport	1058	2,84
F42.2	Construction of utility projects	3298	2,71
E38.3	Materials recovery	1944	2,49
C10.3	Processing and preserving of fruit and vegetables	995	2,06
H49.4	Freight transport by road and removal services	10842	2,05
H50.3	Inland passenger water transport	134	2,01

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees are displayed.

Table A4: Top 10 branches in terms of embeddedness (2019).

NACE	Name	Empl.	Embed.
Total metropolitan region			
H51.1	Passenger air transport	2758	1,17
G46.5	Wholesale of information and communication equipment	1695	1,16
H49.2	Freight rail transport	1972	1,14
H50.3	Inland passenger water transport	433	1,14
F41.1	Development of building projects	1854	1,12
C10.7	Manufacture of bakery and farinaceous products	9619	1,04
H50.4	Inland freight water transport	147	1,03
D35.1	Electric power generation, transmission and distribution	10293	1,03
H53.2	Other postal and courier activities	24131	1,00
C26.3	Manufacture of communication equipment	2221	0,99
City of Berlin			
G46.5	Wholesale of information and communication equipment	1608	1,32
H51.1	Passenger air transport	1968	1,23
H50.3	Inland passenger water transport	299	1,18
F41.1	Development of building projects	1616	1,17
H49.2	Freight rail transport	914	1,14
C26.3	Manufacture of communication equipment	1634	1,13
D35.1	Electric power generation, transmission and distribution	6871	1,08
C14.1	Manufacture of wearing apparel, except fur apparel	411	1,05
C18.1	Printing and service activities related to printing	6192	1,03
C10.7	Manufacture of bakery and farinaceous products	5612	1,03
Environs			
H53.2	Other postal and courier activities	9035	1,56
H52.2	Support activities for transportation	13311	1,52
F42.1	Construction of roads and railways	3671	1,47
H49.4	Freight transport by road and removal services	10842	1,45
F43.1	Demolition and site preparation	1276	1,44
F41.2	Construction of residential and non-residential buildings	6277	1,37
H49.3	Other passenger land transport	5659	1,35
E38.2	Waste treatment and disposal	1718	1,34
F43.9	Other specialised construction activities	6400	1,31
E38.1	Waste collection	1146	1,30

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees are displayed.

Table A5: Top Strengths (2019).

NACE	Name	Employment
Total metropolitan region		
H50.3	Inland passenger water transport	433
H49.2	Freight rail transport	1972
F41.1	Development of building projects	1854
City of Berlin		
H50.3	Inland passenger water transport	299
F41.1	Development of building projects	1616
C26.3	Manufacture of communication equipment	1634
Environs		
E39.0	Remediation activities and other waste management services	209
F42.2	Construction of utility projects	3298
H49.2	Freight rail transport	1058
H49.4	Freight transport by road and removal services	10842
H53.2	Other postal and courier activities	9035
F42.1	Construction of roads and railways	3671
H52.2	Support activities for transportation	13311
F43.1	Demolition and site preparation	1276
E38.1	Waste collection	1146
F41.2	Construction of residential and non-residential buildings	6277

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees are displayed.

Table A6: Top Opportunities (2019).

Total metropolitan region		***Employment***
H51.1	Passenger air transport	2758
G46.5	Wholesale of information and communication equipment	1695
City of Berlin		
H49.2	Freight rail transport	914
H51.1	Passenger air transport	1968
G46.5	Wholesale of information and communication equipment	1608
Environs		
G46.7	Other specialised wholesale	4418

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees are displayed.

Table A7: Top Threats (2019).

NACE	Name	Empl.
Total metropolitan region		
E38.2	Waste treatment and disposal	8334
F42.2	Construction of utility projects	5627
D35.3	Steam and air conditioning supply	631
S95.2	Repair of personal and household goods	1552
H52.1	Warehousing and storage	12373
E38.3	Materials recovery	3392
City of Berlin		
H49.3	Other passenger land transport	30440
C26.4	Manufacture of consumer electronics	576
S95.2	Repair of personal and household goods	1180
C21.2	Manufacture of pharmaceutical preparations	6924
E38.2	Waste treatment and disposal	6616
Environs		
H52.1	Warehousing and storage	10270
C10.3	Processing and preserving of fruit and vegetables	995
E36.0	Water collection, treatment and supply	1111
C30.3	Manufacture of air and spacecraft and related machinery	4542
C25.2	Manufacture of tanks, reservoirs and containers of metal	575
C22.1	Manufacture of rubber products	1903
G45.2	Maintenance and repair of motor vehicles	7446
S95.1	Repair of computers and communication equipment	233
C33.1	Repair of fabricated metal products, machinery and equipment	2098
C17.2	Manufacture of articles of paper and paperboard	1580

Source: Federal Employment Agency, BA, ESPON MISTA (2020) calculations. For illustrative purposes only branches with at least 100 employees are displayed.

5.5 Summary table on size and SWOT-profiles of all productive activities

Table A.8: NACE 3-dgit branch groups and SWOT profiles.

NACE	Name	Total Empl.	City	Envi-rons	Total Reg.
C10.1	Processing and preserving of meat and production of meat products	2134	W	O	
C10.3	Processing and preserving of fruit and vegetables	753	W	S	
C10.4	Manufacture of vegetable and animal oils and fats	205			
C10.5	Manufacture of dairy products	522	W		W
C10.6	Manufacture of grain mill products, starches and starch products	858		S	T
C10.7	Manufacture of bakery and farinaceous products	6968			
C10.8	Manufacture of other food products	3844	W		
C10.9	Manufacture of prepared animal feeds	582		S	W
C11.0	Manufacture of beverages	1773	W	S	W
C13.3	Finishing of textiles		W		
C13.9	Manufacture of other textiles	472	W		W
C14.1	Manufacture of wearing apparel, except fur apparel	689		O	O
C15.2	Manufacture of footwear	137			
C16.2	Manufacture of products of wood, cork, straw and plaiting materials	1883	W		W
C17.1	Manufacture of pulp, paper and paperboard	231	W		W
C17.2	Manufacture of articles of paper and paperboard	2275	W		W
C18.1	Printing and service activities related to printing	3119			
C19.2	Manufacture of refined petroleum products	1236			
C20.1	Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms	2044			
C20.2	Manufacture of pesticides and other agrochemical products	169			
C20.3	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	846	W		
C20.4	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	651	W		
C20.5	Manufacture of other chemical products	739	W		
C21.1	Manufacture of basic pharmaceutical products	204			O
C21.2	Manufacture of pharmaceutical preparations	5395	T		
C22.1	Manufacture of rubber products	334	W		W
C22.2	Manufacture of plastics products	4071	W	T	W
C23.1	Manufacture of glass and glass products	207	W		W
C23.3	Manufacture of clay building materials	124			W
C23.4	Manufacture of other porcelain and ceramic products	126	W		W
C23.5	Manufacture of cement, lime and plaster	167		S	
C23.6	Manufacture of articles of concrete, cement and plaster	1677	W	S	W
C23.7	Cutting, shaping and finishing of stone	740	W		W
C23.9	Manufacture of abrasive products and non-metallic mineral products n.e.c.	174	W		W
C24.1	Manufacture of basic iron and steel and of ferro-alloys		W		
C24.3	Manufacture of other products of first processing of steel	284			W
C24.4	Manufacture of basic precious and other non-ferrous metals	570	W		W
C24.5	Casting of metals	666	W		W

C25.1	Manufacture of structural metal products	2847	W		W
C25.4	Manufacture of weapons and ammunition	609		T	T
C25.5	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	507	W	W	W
C25.6	Treatment and coating of metals; machining	1657	W		W
C25.7	Manufacture of cutlery, tools and general hardware	1301	W		W
C25.9	Manufacture of other fabricated metal products	1516	W	W	W
C26.1	Manufacture of electronic components and boards	959	W	W	
C26.2	Manufacture of computers and peripheral equipment	237	W		
C26.3	Manufacture of communication equipment	724	S		S
C26.4	Manufacture of consumer electronics	218	T		
C26.5	Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks	753	W		
C26.6	Manufacture of irradiation, electromedical and electrotherapeutic equipment	135			O
C26.7	Manufacture of optical instruments and photographic equipment	244	W		
C27.1	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	7091			
C27.3	Manufacture of wiring and wiring devices	713	W	T	W
C27.4	Manufacture of electric lighting equipment	399	W		
C27.5	Manufacture of domestic appliances	146			W
C27.9	Manufacture of other electrical equipment	1174	W		W
C28.1	Manufacture of general-purpose machinery	3292	W	T	W
C28.2	Manufacture of other general-purpose machinery	2513	W		W
C28.3	Manufacture of agricultural and forestry machinery	151			W
C28.4	Manufacture of metal forming machinery and machine tools	131	W		W
C28.9	Manufacture of other special-purpose machinery	4078	W	T	W
C29.1	Manufacture of motor vehicles	808			O
C29.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	595	W		W
C29.3	Manufacture of parts and accessories for motor vehicles	2732	W	W	W
C30.1	Building of ships and boats		W		
C30.2	Manufacture of railway locomotives and rolling stock	1048			
C30.3	Manufacture of air and spacecraft and related machinery	1019		S	
C30.4	Manufacture of military fighting vehicles	140			
C31.0	Manufacture of furniture	2710	W		W
C32.1	Manufacture of jewellery, bijouterie and related articles	1015	W		
C32.2	Manufacture of musical instruments	457			
C32.3	Manufacture of sports goods	448	W		W
C32.4	Manufacture of games and toys	1387			T
C32.5	Manufacture of medical and dental instruments and supplies	2455			
C32.9	Manufacturing n.e.c.	417	W		W
C33.1	Repair of fabricated metal products, machinery and equipment	5328	W		T
C33.2	Installation of industrial machinery and equipment	3210	W		
D35.1	Electric power generation, transmission and distribution	4581			
D35.2	Manufacture of gas; distribution of gaseous fuels through mains	2526			
D35.3	Steam and air conditioning supply	1122	W		
E36.0	Water collection, treatment and supply	600			

E37.0	Sewerage	668	W		W
E38.1	Waste collection	3051	W	S	
E38.2	Waste treatment and disposal	924	T	S	W
E38.3	Materials recovery	316	W	S	W
E39.0	Remediation activities and other waste management services	393			
F41.1	Development of building projects	1634	S		
F41.2	Construction of residential and non-residential buildings	21381	W	O	
F42.1	Construction of roads and railways	4257	W	S	W
F42.2	Construction of utility projects	2388	W		W
F42.9	Construction of other civil engineering projects	627	W		T
F43.1	Demolition and site preparation	1510	W	O	
F43.2	Electrical, plumbing and other construction installation activities	25995			
F43.3	Building completion and finishing	16831	W		W
F43.9	Other specialised construction activities	9782	W		W
G45.1	Sale of motor vehicles	10072	W	S	
G45.2	Maintenance and repair of motor vehicles	10285	W	S	
G45.3	Sale of motor vehicle parts and accessories	3308	W	S	W
G45.4	Sale, maintenance and repair of motorcycles and related parts and accessories	584	W	S	
G46.1	Wholesale on a fee or contract basis	7398		S	
G46.2	Wholesale of agricultural raw materials and live animals	3104	W	S	
G46.3	Wholesale of food, beverages and tobacco	8458	W	S	
G46.4	Wholesale of household goods	20637		O	
G46.5	Wholesale of information and communication equipment	4691	O		S
G46.6	Wholesale of other machinery, equipment and supplies	13981	W	S	T
G46.7	Other specialised wholesale	13434	W	S	
G46.9	Non-specialised wholesale trade	2083	W	S	
H49.1	Passenger rail transport, interurban	1532		O	S
H49.2	Freight rail transport	2625	O	O	S
H49.3	Other passenger land transport	18910	T	O	
H49.4	Freight transport by road and removal services	16050	W	S	
H49.5	Transport via pipeline	338		S	S
H50.3	Inland passenger water transport	135	S		
H51.1	Passenger air transport	7394	O		S
H52.1	Warehousing and storage	973	W	S	
H52.2	Support activities for transportation	21571	W	S	
H53.1	Postal activities under universal service obligation	6603		W	
H53.2	Other postal and courier activities	2119		S	
S95.1	Repair of computers and communication equipment	559			S
S95.2	Repair of personal and household goods	1312	T		

Source: ESPON MISTA (2020) *calculations; S… Strength, W… Weakness, O… Opportunity, T… Threat; Empty cell indicates no specific SWOT profile in the region.*

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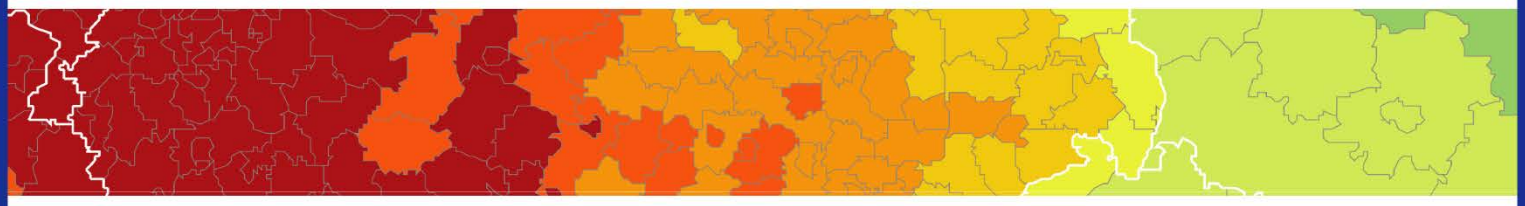

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