THÜNEN

Regional industrial structure, productivity, wealth and income distribution in German regions

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Thünen Working Paper 1

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Thünen Working Paper 1

Braunschweig/Germany, April 2013

Summary

For the impartial observer of German regions, differences in regional industrial structures and prosperity are quite obvious. On the one hand, there are regions characterised by different industries, firm structures and labour qualification profiles. On the other hand, some of these regions are prosperous, dynamic and growing in terms of inhabitants, labor force and income while others suffer from high unemployment, low tax base and an unsatisfactory income situation. The link between the two observations is mainly acknowledged by theories of a Schumpeterian origin as it has frequently been observed that different industries differ in their propensity for innovation. Once the rigid assumptions of standard economic theory are consequentially dropped, it becomes evident that the regional industry mix might have significant implications for the local income distribution as well. Depending on the mobility of different kinds of labour it will thereby also affect regional development in terms of population dynamics.

The present study asks, whether these postulated differentiated relationships between industrial structure and socio-economic fundamentals can be identified statistically and whether they depend on agglomeration effects. Therefore, a cross-sectional estimation with observations on district level (NUTS 3) is carried out in a mediated moderation approach. This approach allows for the differentiation between direct and indirect effects and for the identification of conditional effects, depending, for example, on regions' remoteness. The analysis starts with the creation of eight factors that efficiently describe districts' industrial structures. The factors are consistent with the industrial innovation type taxonomy created by Pavitt (1984). In the final model the regional industrial structure, as described by these factors, explains socio-economic fundamentals that indicate the regions' productivity, its income distribution and its population dynamics.

The analysis generates conceptual/methodological and factual insights. On the factual level it becomes apparent that the relation between local industry-types and socio-economic fundamentals is conditional on (respectively moderated by) remoteness and industry composition. The results also show the differentiated direct and indirect (respectively mediated) relations to different socio-economic indicators. By the identification of these complex relationships, the importance of distributional effects is demonstrated empirically as well. On the conceptual level, the different direct relations are able to illustrate that the same variable indicates different phenomena under different conditions. Moreover, the estimated relations show that seemingly consistent gross relations may be caused by fundamentally different underlying mechanisms and relations. Finally, direct and indirect effects are sometimes opposite in direction. In this case, they would cancel out if only the gross effect was estimated, resulting in insignificant estimators. Nevertheless, the existence of two significant net effects is obviously an important information for example for the design of rational policies.

The important insight that should be gained for future inquiry is that industrial structure matters, that it matters in multiple dimensions and that the effects are conditional upon location and multiple dimensions of industrial structure. The acknowledgement of the different social, economic and cultural dimensions of industrial structure and the relevance of distributional effects require careful further developments of theories within the evolutionary economic paradigm. Important political consequences would result from an empirical confirmation and specification of the relation between industrial mix, productivity and income distribution in the presence of urbanisation and localisation effects. In this case, the local reallocation of resources between industries would have to be supported (Fagerberg, 1994). Currently, policies are mainly guided by standard economic assumptions, and thereby usually do not recognise a need for the support of changes in industrial structure in order to support regional convergence.

JEL: R12, O14, O18, L16, C31

Keywords: Industrial structure, Agglomeration effects, Peripheral rural regions, income distribution, Moderated mediation, Estimation

Zusammenfassung

Der unvoreingenommene Beobachter von Deutschlands Regionen bemerkt schnell die ausgeprägten Unterschiede in der regionalen Unternehmensstruktur und Einkommenssituation. Einerseits sind die Regionen durch verschiedene Branchenzusammensetzungen, Betriebsgrößenverteilungen und Qualifikationsstrukturen der Beschäftigten gekennzeichnet. Andererseits sind einige der Regionen wohlhabend, dynamisch und weisen eine positive Bevölkerungsentwicklung auf, während andere unter hoher Arbeitslosigkeit, geringen Steuereinnahmen und einer unbefriedigenden Einkommenssituation leiden. Der Zusammenhang zwischen den beiden Beobachtungen wird vor allem von Theorien Schumpeterianischen Ursprungs hergestellt, die auch auf der Beobachtung gründen, dass unterschiedliche Branchen sich in ihrer Innovationsneigung unterscheiden. Werden die strikten Annahmen der Standardökonomie einmal fallen gelassen, wird die Möglichkeit deutlich, dass die regionale Branchenzusammensetzung auch Einfluss haben kann auf die Einkommensverteilung in der Region. Abhängig von der unterschiedlichen Mobilität Beschäftigter verschiedener Bereiche steht die regionale Industriestruktur dann auch direkt im Zusammenhang zur lokalen Bevölkerungsdynamik.

Die vorliegende Studie untersucht, ob diese erwarteten differenzierten Beziehungen zwischen der regionalen Industriestruktur und verschiedenen sozio-ökonomischen Fundamentaldaten statistisch identifiziert werden können und ob sie von Agglomerationseffekten beeinflusst werden. Zu diesem Zweck wird eine Querschnittsanalyse basierend auf Beobachtungen auf Landkreisebene in einer "moderated mediation" Schätzung durchgeführt. Diese Schätzung ermöglicht die Unterscheidung zwischen direkten und indirekten Effekten und die Identifizierung bedingter Effekte, die zum Beispiel von der Zentralität von Regionen abhängen. Die Untersuchung beginnt mit der Bildung von acht Faktoren, die die regionale Industriestruktur effizient abbilden können.

Diese Faktoren korrespondieren mit der branchenbezogenen Innovationstypen Taxonomie von Pavitt (1984). Im Schätzmodell erklärt die regionale Industriestruktur, abgebildet durch die acht Faktoren, sozio-ökonomische Daten zur regionalen Produktivität, Einkommensverteilung und Bevölkerungsentwicklung.

Die Analyse generiert konzeptionelle/methodische und inhaltliche Erkenntnisse gleichermaßen. Im Hinblick auf die Fragestellung wird gezeigt, dass die Beziehung zwischen verschiedenen Branchen(typen) und den sozio-ökonomischen Fundamentaldaten abhängig ist von der (bzw. moderiert wird durch die) Lage der Regionen und der Bedeutung der jeweils anderen Branchen(typen) in dergleichen Region. Darüber hinaus zeigen die Ergebnisse die differenzierten direkten und indirekten (bzw. vermittelten, "mediated") Beziehungen zwischen den verschiedenen Indikatoren. Durch die Identifizierung dieser komplexen Beziehungen kann auch die Bedeutung unterschiedlicher Verteilungseffekte aufgezeigt werden. In konzeptioneller Hinsicht können die unterschiedlichen direkten Beziehungen illustrieren, dass dieselben Variablen unter verschiedenen Umständen Indikatoren unterschiedlicher Phänomene sein können. Darüber hinaus können die differenzierten Beziehungen zeigen, dass in der aggregierten Betrachtung scheinbar gleichgerichtete Beziehungen auf unterschiedliche Mechanismen und Kausalbeziehungen zurückgehen können. Schließlich weisen die direkten und indirekten Zusammenhänge manchmal unterschiedliche Vorzeichen auf. Würde eine undifferenzierte Schätzung vorgenommen, wäre der Schätzer daher möglicherweise insignifikant. Die Existenz zweier signifikanter Einzeleffekte stellt aber möglicherweise eine wichtige Information zum Beispiel für die theoriegeleitete Entwicklung politischer Maßnahmen dar.

Zentrale Erkenntnisse für die weitere Forschung sind, dass der regionalen Branchenstruktur eine Bedeutung für die Produktivitäts- und Einkommenssituation zukommt, dass diese Bedeutung mehrere Dimensionen der sozio-ökonomischen Situation betrifft und dass sie abhängig ist von der Lage der Region und verschiedenen Dimensionen der Branchen- und Firmenstruktur. Die Anerkennung der unterschiedlichen sozialen, ökonomischen und kulturellen Dimensionen der Beziehung zwischen Unternehmensstruktur und regionaler Situation muss eine sorgfältige Weiterentwicklung entsprechender (regional-)ökonomischer Theorien innerhalb des evolutionären Paradigmas nach sich ziehen. Könnten entsprechende Zusammenhänge zwischen regionaler Unternehmensstruktur, Produktivität und Einkommensverteilung in Gegenwart von Urbanisierungs- und Lokalisierungseffekten empirisch validiert und theoretisch spezifiziert werden, so würden sich wichtige politische Konsequenzen ergeben. In diesem Fall müsste vor dem Ziel der Konvergenz die regionale Neuverteilung von Ressourcen zwischen Branchen, also der Strukturwandel, unterstützt werden (Fagerberg, 1994). Diese Notwendigkeit wird gegenwärtig unter dem Paradigma regionaler Standardannahmen normalerweise nicht gesehen.

JEL: R12, O14, O18, L16, C31

Schlüsselwörter: Branchenstruktur, Agglomerationseffekte, Ländlich-periphere Regionen, Einkommensverteilung, Schätzung indirekter konditioneller Effekte

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1 Industry- and income-distribution: A blind spot in regional economics?

For the impartial observer of German regions, differences in regional industrial structures and prosperity are quite obvious. On the one hand, there are regions characterised by heavy industries, or by primary production based on agriculture, fishery and/or forestry, or by a multitude of manufacturing firms, or by the tourism industry, or by services in the finance and insurance industry, or by knowledge-intensive production and services or by big industry. On the other hand, some of these regions are prosperous, dynamic and growing in terms of inhabitants, labor force and income while others suffer from high unemployment, low tax base and an unsatisfactory income situation.

Despite these apparent differences in industrial structure on the one hand and in the socio-economic situations on the other hand, little is known about the relationship between these two dimensions. The analysis presented in this paper tries to shed some light on this theoretically caused blind spot. Therefore, in an empirical explorative approach, it relates the regional industrial structure and regions' remoteness to the socio-economic fundamentals that describe the regions' productivity, its income distribution and its population dynamics. The analysis differentiates direct and indirect relationships between industry-structure and the socio-economic situation. It therefore allows for a differentiated perspective on the socio-economic phenomena that often go along with the prevalence of specific industries, firms and qualifications.

1.1 Theoretical background

Such an analysis might at a first glance be judged as naive and simplistic from a methodological and from a theoretical perspective. From a methodological perspective, one cannot expect to identify causal effects of industrial structures upon the economic development in such a cross-sectional analysis. The identification of these causal effects is not the purpose of the present analysis. It is content with the identification of the relation between a multitude of different indicators that picture the local industry on one side and the socio-economic situation on the other. From a theoretical perspective, many might expect more subtle relations between local production and the socio-economic situation. According to standard economic theory, productivity differences should not be explained in terms of industry characteristics but rather in terms of firm- and region specific characteristics. At the same time, productivity differences should be the main reason for other differences in socio-economic aspects. Nevertheless, this study starts from a different economic paradigm, which rests on a Schumpeterian, evolutionary point of view.

According to standard economic theories, there should be no difference in the income-generating ability of different industries. According to respective models, the economy is in equilibrium as long as no exogenous disturbances occur. In this equilibrium, the marginal

productivity of all factors of all activities is identical (Paci and Pigliaru, 1997). In perfect markets with many producers, which are also usually assumed by standard theories, prices will reflect this marginal productivity and remaining rents will be appropriated by buyers. Accordingly, differences in income and income distribution should not depend on industry characteristics. Moreover, standard economic models usually assume the existence of a unique equilibrium that is independent of the actual course of development. Analyses within this paradigm usually strive for explanations of differences in economic fundamentals in terms of exogenous long-term characteristics of regions, while industries, firms and labour are usually assumed to be mobile. Accordingly, firms will move to those places, where they find favourable site-related factors and labour will move to those places where the firms have settled. According to these assumptions it seems reasonable to explain differences in the economic situation of different regions with fundamental site-related factors as well.

The evolutionary paradigm, in contrast, takes into account the possibility of endogenous dynamics. The course and the direction of endogenous dynamics depend upon decisions of economic actors themselves. Within the evolutionary paradigm, lasting differences in economic fundamentals might not be explainable by exogenous site-specific factors but rather by economic structures themselves. In alternative economic models, the assumption of endogenous differences often relies on the argument of positive external effects of production. Thereby, agglomeration effects result that explain a general tendency for a clustering of economic activity. These general, not industry specific effects are usually referred to as urbanization effects. They are most famously introduced by Marshall (1890) and have been formalised based on specific assumptions and monopolistic competition by Krugmann (1998). Thereby he founded the "New Economic Geography". In recent decades, most famously represented by Porter (1998), industry specific external effects of production, the localisation effects, have also been taken into account, in order to explain an uneven distribution of industries in space. Nevertheless, in these cases, differences in regional productivity have usually not been attributed to the prevalence of specific industries but rather to the clustering of these industries in space. Accordingly, urbanisation and localisation effects themselves would not justify the hypothesis that specific industries and their distribution in space should result in differences in regions' prosperity.

Industries' potential differences in economic productivity are mainly acknowledged by theories of a Schumpeterian origin. In respective models, profits and thereby growth are determined by innovative activities. These innovations are endogenous to the economic process as they are a reaction of firms, industries and sectors to competition. In the resulting process of "creative destruction", the additional wealth from technical progress accrue to those firms and industries which enabled technical progress by their innovations and which satisfied new demands with the development of new products. Due to pioneering rents the most innovative firms and industries show the highest economic productivity and create the highest income. While these rents are of a temporary character principally due to the adoption of innovations by followers and their replacement in the course of creative destruction, it has frequently been observed that different industries differ in their propensity for innovation. Accordingly, "countries specialised in

technological areas with opportunities for higher rates of productivity growth might be in a better position to achieve fast overall growth" (Jungmittag, 2004: 248). Jungmittag (2007) analyses the relation between total productivity growth and employment shares in different sectors which are divided according to their knowledge intensity. He finds a significant correlation between shares in high- and medium technology production and knowledge intensive services on the one hand and productivity growth on the other hand. Pavitt (1984) provides a taxonomy of patterns of innovation which is based on industry-specific characteristics (Castellacci, 2006). Pavitt identified patterns of innovations that differed for science-based, scale-intensive and supplier-dominated sectors and specialised suppliers.

His discussion of the firms' characteristics by innovation type clarifies that growth of firms from supplier dominated sectors is often due to rationalisation. Supplier dominated sectors usually do not innovate themselves but introduce technological change produced by other industries. There are no additional profits to be gained. Accordingly, neither a specifically high productivity nor positive income effects may usually be expected for regions characterised by these industries. Firms from scale intensive sectors realise innovations in "the search for increasing static scale economies in production." They may contribute to a relatively high productivity within their region but less so to the creation of jobs and a broad labour market participation. Specialised suppliers, on the other side, "depend more on their customers for information and skills related to the operating performance, and [...] do not accumulate the same range and depth of technological skills", accordingly "they find it more difficult to appropriate the benefits of their innovations, given the overwhelming importance of product innovation, and relatively low barriers to entry". Accordingly, these firms do not innovate for rationalisation in the first place and contribute potentially to a relatively positive labour market. Nevertheless, they probably do not contribute to a particularly high regional productivity as they have difficulties to appropriate the fruits of their product innovations. In science based industries, finally, firms' dynamics depend on the type of scale barriers. With low static scale barriers successful small innovators "can quickly become very big. Since imitators are chasing the innovator down steeply declined cost curves." With high static scale barriers, firm entrant dynamics are typically very low and innovation takes place in large existing firms. Science based industries therefore have the potential to provide new jobs, but these jobs will typically be for relatively highly skilled people. Science based industries should contribute to high productivity.

In the innovation based "evolutionary view, the impact of innovation on the international competitiveness of industries must therefore be analysed within a complex framework comprising both the broader systemic context shaping innovative activities and the sectoral specificities that characterize the creation and diffusion of knowledge" (Castellacci, 2008). Accordingly, regions that, due to external differences in site-specific factors or due to endogenous external effects of production, show a dominance of those industries with the highest propensity to innovate should be able to realise higher incomes than regions characterised by industries with a lower propensity to innovate, e.g., by specialised suppliers. To summarise, innovative activities may explain differing levels in economic productivity in different

regions, if different industries show different propensities to innovate and the industry mix differs between regions. An innovation-based approach therefore justifies the analysis of the relationship between the prosperity of regions and the regional industry mix.

1.2 Political relevance

If there was a relation between the prosperity of regions and the regional industry mix, this would have important policy implications as well. Under the standard economic assumptions there is no necessity to support a change in industrial structure in order to support regional convergence. Instead, efficiency and the amelioration of productivity would have to be supported irrespective of the regional industry mix. If the relation between industry mix and productivity that is implied by innovation based approaches would be confirmed, in contrast, addressing the productivity of existing industries might not suffice in order to support regional convergence. Instead, the local reallocation of resources between industries would have to be supported (Fagerberg, 1994).

Due to long-term endogenous differences between regions and given exogenous differences in site-specific factors, absolute convergence will not be reached with industry-specific differences in productivity if different industries have different requirements with respect to their location. Especially different industries might take differing advantages of urbanisation and localisation effects. Specifically, evidence and theory imply that mainly knowledge-intensive industries with a high propensity for innovation profit from agglomeration effects. Therefore, peripheral regions might be disadvantaged if their industry mix is less knowledge-based and those firms in peripheral regions that belong to knowledge based industries might be less productive due to the lack of positive external effects of production. Nevertheless, these negative effects might differ across industries. Accordingly, preferable industry compositions might differ for agglomerated and for peripheral regions.

Once the rigid assumptions of standard economic theory are dropped, it becomes evident that not only the total productivity and prosperity of regions might be linked to the local industry mix but income distribution as well. As Sener (2001:121) writes, standard models ignore "dynamic linkages between trade, technological change, and labor markets". To take these aspects into account, alternative Schumpeterian models of economic growth have been developed (Dinopoulos and Segerstrom, 1999; Sener, 2001), which show that if a higher degree of innovative activity causes a higher relative demand for skilled labour, this may go along with a rise in the relative wage of skilled workers and a rise in the unemployment rate of less-skilled workers. The regional industry mix might therefore have significant implications for the local income distribution. Depending on the mobility of different kinds of labour it will thereby also affect regional development in terms of population dynamics.

Based on these insights we postulate that a region's wealth and income distribution should at least partly be explained by its industrial structure, i.e., by its industry composition, the size of its firms and the qualifications of its labour force. We do not analyse the dynamics of regional development but rely on a cross sectional analyses of regional productivity and wealth. Therefore, one must be cautious in applying causal interpretations, as cross-sectional analyses are prone to problems of omitted variable biases and multicollinearity. Therefore, this analysis is a modest first attempt to get an idea of the observable relationship between local industrial structures in agglomerated and peripheral regions on the one hand and regional wealth and income distribution on the other.

2 Indicators, measurement issues and characterisations

In this study, economic fundamentals of districts (German "Landkreise", NUTS 3) are related statistically to the local industrial structure and the districts' remoteness. This chapter starts with the presentation of the indicators that were selected for the analysis. Section 2.1 describes how the indicators were summarised in common factors in order to describe efficiently the underlying dimensions. Section 2.2 illustrates the geographical distribution of the values of the socio-economic indicators in a number of maps.

The economic fundamentals to be explained are the district's gross domestic product (GDP) per inhabitant, its unemployment rate, mean wages paid in the district, mean household income, the district's tax receipts and its population development (Table 1). These indicators were selected as albeit imperfect indicators for productivity, economic participation, distribution of income between capital, labour and the state, private and regional wealth and demographic developments, which are among the most relevant socio-economic fundamentals. Industrial structure is defined by the qualification of the work force, the size distribution of firms (Table 1) and by the industry mix (Table 2 for non-manufacturing and Table 3 for manufacturing industries). Remoteness is measured with three indicators, the distance to the next regional metropolis, the distance to the next highway and the district's population potential (Table 1).

Table 1: Size of firms, qualification of labour and socio-economic fundamentals in the districts

Variable	Label	N	Mean	Std Dev	Min	Max
Share of employees 2007: (data from Federal Labour Office)						
ShareLargeFirms	Share of firms with 250 and more employees	372	0.42	0.17	0.00	0.96
ShareSmallFirms	Share of firms with one to nine employees	372	0.08	0.04	0.00	0.31
ShareMedFirms	Share of firms with 100 to 249 employees	372	0.19	0.07	0.00	0.46
ShareHighqual	Share of employees with university degree	372	0.04	0.03	0.01	0.26
ShareAddqual	Share of employees with university entrance and occupational qualification or with polytechnic degree	372	0.08	0.03	0.02	0.23
ShareNoqual	Share of employees without occupational or university entrance qualification	372	0.18	0.06	0.05	0.37
DominantFirm	Share of "lost" employees due to disclosure rules as indicator for the dominance of one to three large firms within specific industries	371	0.07	0.08	0.00	0.60
Other indicators for socio-economic situation: (Data from INKAR)						
PopPotential	Weighted population within a radius of 100 km (in 1000), 2008	371	432.88	392.33	50.60	2,308.60
DistCity	Journey time to the next regional metropolis (minutes), 2010	371	28.77	18.11	0.00	79.60
DistHighway	Journey time to the next highway (minutes), 2010	371	14.49	9.60	0.40	63.30
Income	Household income, 2007 (Euro/inhabitant)	371	1,506.53	196.96	1,117.10	2,397.00
Unempl	Unemployment, 2008 (in percent)	371	8.31	4.25	1.90	21.50
Wages	Wages, 2007 (Euro/employee/month)	371	2,648.42	355.04	1,880.50	4,124.30
GDP	Gross domestic product (GDP), 2007 (1000 Euro/inhabitant)	371	27.40	10.02	15.10	83.50
Tax	Tax receipts, 2008 (Euro/inhabitant)	369	644.35	215.11	238.90	1,912.20
PopDev	Population development, 2003-2008 (in percent)	371	-1.27	2.83	-9.00	6.50

Source: Federal Labour Office/INKAR (Database provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)).

Next to remoteness, the local industrial structure is the second explanatory factor for the districts' socio-economic fundamentals in the analysis. The local industrial structure is characterised by the firm size distribution and the qualification of employees (Table 1) and by the share of employees in different industry on the two-digit level of the NACE classification (Table 2 and Table 3). As Table 2, with the shares of non-manufacturing industries, and Table 3, with shares of manufacturing industries in total employment, show, some industries were omitted from the analysis due to problems with missing values due to disclosure rules.

Table 2: Share of employees in non-manufacturing industries (NACE 2007, two digit) in percent

Industry	Label	N	Mean	Std Dev	Min	Max
Ind 1	Share of workforce in Agriculture 2008 (Data from INKAR)	371	3.08	2.08	0.10	10.10
Ind 2	Forestry and logging	369	0.10	0.15	0.00	0.93
Ind 3	Fishing and aquaculture	360	0.02	0.08	0.00	1.42
Ind 33	Repair and installation of machinery and equipment	371	0.55	0.48	0.02	4.27
Ind 35	Electricity, gas, steam and air conditioning supply	369	0.76	0.83	0.00	10.60
Ind 38	Waste collection, treatment and disposal activities; materials recovery	371	0.54	0.39	0.03	3.41
Ind 41	Construction of buildings	371	1.19	0.71	0.06	6.58
Ind 42	Civil engineering	371	0.85	0.70	0.03	5.70
Ind 43	Specialised construction activities	371	4.78	1.57	1.16	12.63
Ind 45	Wholesale and retail trade and repair of motor vehicles and motorcycles	371	2.37	0.64	0.96	6.75
Ind 46	Wholesale trade except of motor vehicles and motorcycles	371	4.61	2.16	0.52	18.57
Ind 47	Retail trade except of motor vehicles and motorcycles	371	8.02	1.64	4.08	13.24
Ind 49	Land transport and transport via pipelines	371	1.59	0.61	0.27	3.73
Ind 52	Warehousing and support activities for transportation	371	2.22	1.60	0.25	14.49
Ind 53	Postal and courier activities	369	0.68	0.42	0.09	3.80
Ind 55	Accommodation	371	1.11	1.51	0.04	18.63
Ind 56	Food and beverage service activities	371	2.01	0.76	0.80	7.02
Ind 58	Publishing activities	369	0.35	0.37	0.00	2.43
Ind 59	Motion picture, video, and television programme production, sound recording and music publishing activities	369	0.07	0.23	0.00	3.25
Ind 61	Telecommunications	371	0.19	0.32	0.00	3.11
Ind 62	Computer programming, consultancy and related activities	371	1.04	1.19	0.05	11.11
Ind 63	Information service activities	369	0.14	0.18	0.00	1.63
Ind 64	Financial service activities, except insurance and pension funding	371	2.11	1.00	0.14	11.92
Ind 65	Insurance, reinsurance and pension funding, except compulsory social security	369	0.31	0.82	0.00	8.42
Ind 66	Activities auxiliary to financial services and insurance activities	371	0.38	0.25	0.09	2.41
Ind 68	Real estate activities	371	0.56	0.38	0.06	2.56
Ind 69	Legal and accounting activities	371	1.22	0.41	0.33	3.76
Ind 70	Activities of head offices; management consultancy activities	371	0.91	1.00	0.07	7.59
Ind 71	Architectural and engineering activities; technical testing and analysis	371	1.24	0.91	0.29	11.25
Ind 72	Scientific research and development	371	0.45	0.82	0.00	6.97
Ind 73	Advertising and market research	371	0.26	0.24	0.01	2.04
Ind 74	Other professional, scientific and technical activities	371	0.14	0.14	0.01	1.33
Ind 75	Veterinary activities	371	0.09	0.06	0.01	0.57
Ind 77	Renting and leasing activities	371	0.23	0.19	0.01	1.49
Ind 78	Employment activities	371	1.69	1.25	0.00	8.93
Ind 79	Travel agency, tour operator reservation service and related activities	371	0.19	0.18	0.02	2.25
Ind 80	Security and investigation activities	371	0.32	0.36	0.00	3.31
Ind 81	Services to buildings and landscape activities	371	1.74	0.83	0.36	6.77
Ind 82	Office administrative, office support and other business support activities	371	0.71	0.84	0.02	6.85
Ind 86	Human health activities	371	7.56	2.43	2.83	19.70
Ind 92	Gambling and betting activities	371	0.14	0.11	0.01	0.84
Ind 93	Sports activities and amusement and recreation activities	371	0.31	0.24	0.07	2.34

Source: Own table; calculation based on data from the Federal Labour office (2007).

There were too many missing values in all activities related to mining (NACE Section B, two-digit classification industries 5 to 9). The same applies to manufacturing of tobacco products (12), manufacture of coke and refined petroleum products (19), water transport (50), air transport (51), programming and broadcasting activities (60) and creative, arts and entertainment activities (90).

We deliberately did not take into account those "industries" that represent ubiquitous public services and therefore have little potential for industry differentiation, specifically water collection, treatment and supply (36), sewerage (37), remediation activities and other waste management services (39), public administration and defense, compulsory social security (84), Education (85), residential care activities (87), social work activities without accommodation (88) and libraries, archives, museums and other cultural activities (91). Also not included were all industries starting from Section S or Industry 94 upward.

Table 3: Share of employees in manufacturing industries (NACE 2007, two digit) in percent

Industry	Label	N	Mean	Std Dev	Min	Max
Ind 10	Food products	370	2.67	1.81	0.21	14.46
Ind 11	Beverages	348	0.32	0.40	0.00	2.62
Ind 13	Textiles	371	0.31	0.64	0.00	7.90
Ind 14	Wearing apparel	365	0.17	0.37	0.00	3.73
Ind 15	Leather and related products	369	0.07	0.22	0.00	3.76
Ind 16	Wood and products of wood and cork except furniture; articles of straw and plaiting materials	369	0.56	0.65	0.00	4.07
Ind 17	Paper and paper products	369	0.51	0.65	0.00	5.78
Ind 18	Printing and reproduction of recorded media	371	0.60	0.57	0.00	4.40
Ind 20	Chemicals and chemical products	369	1.20	2.46	0.00	31.39
Ind 21	Basic pharmaceutical products and pharmaceutical preparations	366	0.37	0.69	0.00	6.15
Ind 22	Rubber and plastic products	369	1.59	1.91	0.00	16.87
Ind 23	Other non-metallic mineral products	371	1.10	1.61	0.04	15.43
Ind 24	Basic metals	369	1.15	1.76	0.00	13.38
Ind 25	Fabricated metal products except machinery and equipments	371	3.26	2.77	0.09	17.62
Ind 26	Computer, electronic and optical products	369	1.39	1.60	0.00	13.86
Ind 27	Electrical equipment	371	1.18	1.43	0.00	9.53
Ind 28	Machinery and equipment	371	3.88	3.56	0.03	27.55
Ind 29	Motor vehicles, trailers and semi-trailers	368	2.81	3.85	0.00	32.80
Ind 30	Other transport equipment	367	0.43	0.72	0.00	5.33
Ind 31	Furniture	371	0.52	0.82	0.00	8.34
Ind 32	Other manufacturing	371	0.91	1.38	0.07	17.38

Source: Own table; calculation based on data from the Federal Labour office (2007).

2.1 Calculation of industry- and remoteness factors

In order to handle the large number of indicators that characterise industrial structure and remoteness on the right hand side of the regression equation, two separate factor analyses were conducted for the measurement of remoteness and industrial structure. Factor analyses allow the larger part of the information contained in a number of indicators to be captured within a smaller number of artificially constructed indicators, the factors. Therein, the covariance between factors is minimised and the common variance of indicators within factors is maximised. Depending on the common variance of the indicators, their contribution to each factor is weighted by the so-called factor loading. A high factor loading shows that an indicator contributes a high share to the common variance of all indicators combined within a factor.

In the present analysis we rely on principal component analysis, a specific type of factor analysis that aims at the reproduction of the structure of data by a minimised number of factors (Backhaus et al., 2003). Each factor, or principal component, explains a specific share of the variance of all indicators, which is expressed by the factor's *eigenvalue*. Technically spoken, the principal component analysis aims at a reproduction of the correlation matrix that forms the starting point of the factor analysis. The communality, i.e., the share of the variance to be reproduced, is always assumed to be one in the principal component analysis. The variance of all indicators is distributed such that the variance of all indicators can be captured by a minimised number of factors. Finally, those coefficients, or factor loadings, are calculated which describe the quantitative relation of the single indicators to the common factors. The squared factor loading equals the share of the variance of an indicator that is explained by the factor. All squared factor loadings of a variable sum up to its communality, i.e., to the share of the indicator's variance that is captured by the factors. The *eigenvalue* of a factor, in contrast, describes the share of the variance of all indicators that is ascribed to the factor. Usually, only those factors with a relatively high share in the reproduction of the variance of all indicators are extracted. Geometrically, these factors can be seen as axes of a coordinate system. A rotation of theses axes often enables a more unambiguous attribution of indicators to specific factors and therefore facilitates interpretation without damaging the analysis' validity (Backhaus et al., 2003).

With respect to the measurement of remoteness, one single factor was created in a principal component analysis based on the three indicators (see Table 1). With a scree-test we test the adequateness of the selection of a single factor. The scree-test is based on a graphic representation of the share of total variance that can be explained by each additional factor. If the resulting curve kinks downward at one place, the optimal number of factors is determined by the last factor previous to the kink. With respect to remoteness, the scree-test clearly confirms the selection of one single factor. Moreover, only the first factor has an *eigenvalue* larger than one. With an *eigenvalue* of 1.44, it explains significantly more from the overall variance than its own variance and therefore complies with the Kaiser-criterion for the determination of the number of factors. The Kaiser-Meyer-Olkin criterium tests for undesired endogenity of indicators. Its value of 0.67 is sufficiently high in order to justify the factor analysis with our three indicators.

The unexplained variance aside the main diagonal is 0.057 in the mean, which indicates that the deviation of the reproduced matrix from the original matrix is sufficiently low. Factor loadings of the factor that describes remoteness are presented in Table 4.

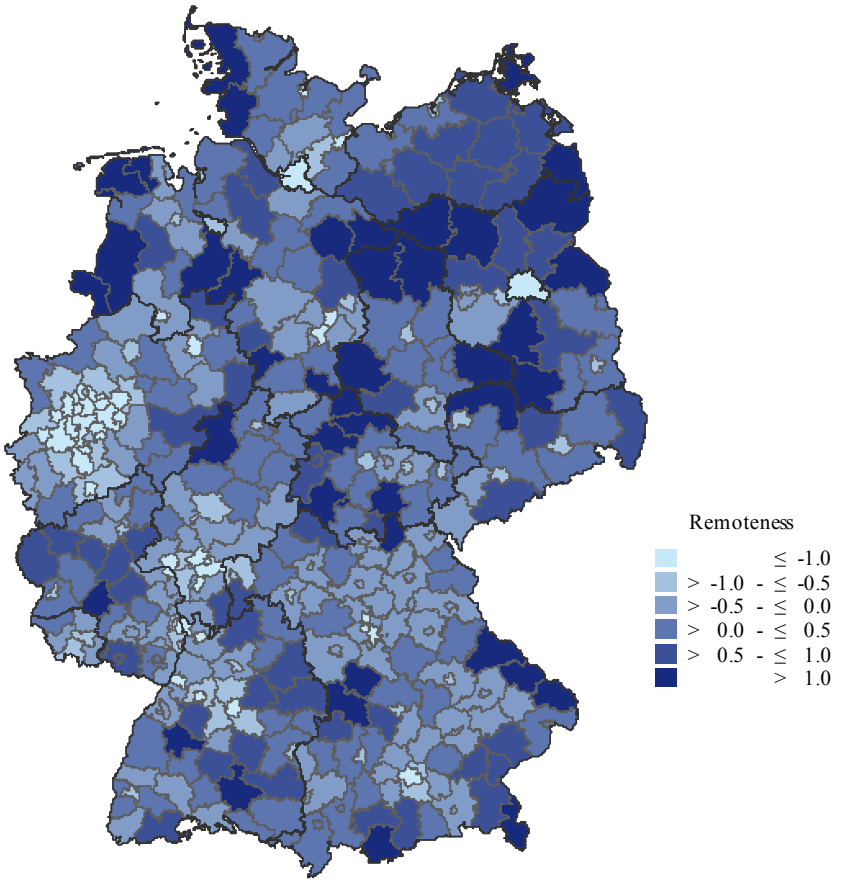
Table 4: Loadings of variables on the remoteness factor

	Loadings factor "remoteness"
PopPotential	-0.60
DistCity	0.75
DistHighway	0.71

Source: Own calculation.

Accordingly, all three indicators contribute roughly the same weight to the measurement of remoteness, but the weighted population receives a negative loading and therefore relates reversely to remoteness, while the two distance-related indicators contribute to remoteness with a positive weight. Map 1 shows the distribution of remoteness as measured by this factor.

Map 1: Remoteness measured by the remoteness factor (NUTS 3)



Source: Based on own calculations; basis for the map: GfK GeoMarketing (2010).

In this paper we intend to characterise the districts in terms of their complete industry mix, i.e., in terms of those factors that are found to describe the industry-mix most comprehensibly. As in the measurement of remoteness we rely on principal component analysis (see above). The application of the same decision rules as explained above guides us to the extraction of eight factors (Table 5).

In this case the scree-test did not provide unambiguous guidance. Therefore, considerations with regard to content were of some importance in the determination of the number of industrial factors. Moreover, the eighth factor is the last factor to have an *eigenvalue* larger than one. The selection of eight factors therefore complies with the Kaiser-criterion. The Kaiser-Meyer-Olkin criterium shows a value of 0.78 and therefore confirms the adequateness of a factor analysis based on our indicators for local industrial structure. The unexplained variance aside the main diagonal is 0.037 in the mean, which indicates that the deviation of the reproduced matrix from the original matrix is sufficiently low.

Table 5: Industrial factors and loadings of 0.2 and higher of the underlying variables

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Ind69	Legal and accounting activities	0.76	.	.	.	.	.	.	0.25
Ind66	Activities auxiliary to financial services and insurance activities	0.73	.	.	.	.	.	.	.
Ind64	Financial service activities, except insurance and pension funding	0.73	.	.	.	.	.	.	.
Ind73	Advertising and market research	0.68	.	.	.	.	.	.	.
Ind65	Insurance, reinsurance and pension funding, except compulsory social security	0.58	.	.	.	.	.	.	.
Ind70	Activities of head offices; management consultancy activities	0.58	.	.	.	.	.	.	.
Ind79	Travel agency, tour operator reservation service and related activities	0.51	.	.	.	.	.	.	.
Ind58	Publishing activities	0.46	.	.	.	.	.	0.23	.
Ind63	Information service activities	0.38	0.21	.	.	.	.	.	.
Ind74	Other professional, scientific and technical activities	0.38	.	.	0.20	.	.	.	.
Ind61	Telecommunications	0.34	.	.	.	.	.	.	.
Ind92	Gambling and betting activities	0.27	.	.	.	.	.	-0.20	.
Ind59	Motion picture, video, and television programme production, sound recording and music publishing activities	0.26	.	.	.	.	.	0.21	.
Ind71	Architectural and engineering activities; technical testing and analysis	.	.	.	.	.	.	.	.
Ind68	Real estate activities	0.29	0.60	.	.	-0.24	.	.	.
Ind49	Land transport and transport via pipelines	.	0.57	.	-0.22	.	.	.	.
Ind38	Waste collection, treatment and disposal activities; materials recovery	-0.25	0.56	.	.	.	.	.	.
Ind81	Services to buildings and landscape activities	.	0.54	.	.	.	.	.	.
Ind80	Security and investigation activities	0.25	0.47	.	.	.	.	.	.
Ind82	Office administrative, office support and other business support activities	.	0.43	.	.	-0.25	.	.	.
Ind78	Employment activities	.	0.38	.	.	.	-0.26	.	.
Ind53	Postal and courier activities	.	0.31	.	.	.	.	.	.
Ind35	Electricity, gas, steam and air conditioning supply	.	0.30	.	0.24	.	.	.	.

Table 5: Industrial factors and loadings of 0.2 and higher of the underlying variables – Continued 1

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Ind33	Repair and installation of machinery and equipment	.	0.20	.	.	.	.	.	.
Ind15	Leather and related products	.	.	.	.	.	.	.	.
Ind18	Printing and reproduction of recorded media	.	-0.26	.	.	.	.	.	.
Ind14	Wearing apparel	.	-0.26	.	.	.	.	.	.
Ind31	Furniture	.	-0.29	0.28	.	.	.	.	.
Ind32	Other manufacturing	.	-0.31	.	.	.	.	.	.
Ind22	Rubber and plastic products	.	-0.33	0.26	.	.	.	.	.
Ind27	Electrical equipment	.	-0.43	.	.	-0.31	.	.	.
Ind25	Fabricated metal products except machinery and equipments	-0.22	-0.46	.	-0.32	-0.37	.	-0.29	.
Ind28	Machinery and equipment	.	-0.54	.	.	.	.	.	.
	ShareNoqual	.	-0.66	.	.	.	.	-0.30	.
Ind16	Wood and products of wood and cork except furniture; articles of straw and plaiting materials	.	-0.32	0.63	.	.	.	.	.
	Share of workforce in Agriculture	.	.	0.62	.	0.39	.	.	.
Ind41	Construction of buildings	.	.	0.59	.	.	.	.	.
Ind02	Forestry and logging	.	.	0.56	.	.	.	.	.
Ind43	Specialised construction activities	-0.26	.	0.44	.	0.31	.	.	.
Ind23	Other non-metallic mineral products	.	.	0.39	.	.	.	.	.
Ind42	Civil engineering	.	0.26	0.31	.	.	.	.	.
	DominantFirm	.	.	.	0.83	.	.	.	.
Ind29	Motor vehicles, trailers and semi-trailers	.	.	.	0.69	.	.	.	.
	ShareLargeFirms	.	.	-0.31	0.66	.	.	.	.
Ind30	Other transport equipment	.	.	.	0.42	.	.	.	.
Ind11	Beverages	.	.	0.20	0.30	.	.	.	.
Ind21	Basic pharmaceutical products and pharmaceutical preparations	.	.	-0.24	0.24	.	.	0.24	.

Table 5: Industrial factors and loadings of 0.2 and higher of the underlying variables –Continued 2

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Ind17	Paper and paper products	.	.	.	0.21	.	.	.	.
Ind20	Chemicals and chemical products	.	.	.	.	.	.	.	.
	ShareMedFirms	.	.	0.25	-0.51	.	-0.20	.	0.22
Ind75	Veterinary activities	.	.	.	.	0.58	.	.	.
Ind47	Retail trade except of motor vehicles and motorcycles	.	.	-0.27	.	0.58	.	.	.
Ind45	Wholesale and retail trade and repair of motor vehicles and motorcycles	.	.	.	.	0.47	.	.	.
Ind10	Food products	.	.	0.24	.	0.45	.	.	.
Ind46	Wholesale trade except of motor vehicles and motorcycles	.	-0.28	-0.27	-0.27	0.36	.	.	-0.34
Ind55	Accommodation	.	.	.	.	.	0.88	.	.
Ind03	Fishing and aquaculture	.	.	.	.	.	0.72	.	.
Ind56	Food and beverage service activities	.	.	.	.	.	0.71	.	.
	ShareSmallFirms	.	.	.	-0.37	.	0.48	.	.
Ind93	Sports activities and amusement and recreation activities	.	0.21	.	.	.	0.25	.	.
Ind13	Textiles	.	.	.	.	.	.	.	.
	ShareHighqual	.	.	-0.22	.	.	.	0.61	.
	ShareAddqual	.	.	-0.41	.	.	.	0.54	.
Ind72	Scientific research and development	.	.	.	.	.	.	0.47	.
Ind26	Computer, electronic and optical products	.	-0.41	.	.	-0.24	.	0.45	.
Ind62	Computer programming, consultancy and related activities	0.30	.	-0.21	.	.	.	0.41	.
Ind24	Basic metals	.	.	-0.33	.	-0.24	.	-0.41	.
Ind86	Human health activities	.	.	.	.	.	.	.	0.72
Ind77	Renting and leasing activities	0.24	.	.	.	.	.	.	-0.39
Ind52	Warehousing and support activities for transportation	.	0.24	.	.	0.21	.	.	-0.43

Note: Values < 0.2 not printed.

Source: Own calculation.

The rotated factors are well interpretable. Factor 1 is mainly constructed by services related to financial, legal and market services. They might be summarised as business or professional services (Table 6).

Table 6: Characterisation of factors by industry and innovation type

Factors	Type	Production Type	Innovation type	Service Type
Factor1	Service			Professional
Factor2	Production	Simple	Specialized supplier	
Factor3	Production	Primary and related	Supplier-dominated	
Factor4	Production	Large scale/motor vehicles	Scale intensive	
Factor5	Service	Food related		Trade
Factor6	Service			Recreation
Factor7	Production	Knowledge intensive	Science-based	
Factor8	Service			Health

Source: Own illustration.

Factor 2 shows that there is a polarisation between regions that are characterised by low level professional services and regions that are characterised by production activities and a high share of unqualified labour. We decided to define the factor via the latter pole. Therefore, the signs of the factor's loadings are reversed, and a high value of Factor 2 accordingly implies the prevalence of a high share of simple production activities (Table 6), specifically of metal production including machinery and equipment. Respective firms are often organised as "specialised suppliers". Therefore this factor corresponds to the respective innovation pattern in Pavitt's (1984) classification (Table 6; see Chapter 1). Factor 3 has high loadings on activities related to construction or primary production. Especially primary production is characterised by rapid technical progress, but this technical progress is imported from upstream sectors. The factor therefore is related to the supplier-dominated innovation pattern as it is described in Pavitt's taxonomy. Factor 4 has high loadings on the indicator for dominant firms and on the share of large firms as well as on the production of motor vehicles and other transport equipment. The factor therefore reflects industries that belong to the scale intensive innovation pattern in Pavitt's taxonomy. Factors 5 and 6 are created based on services related to trade and recreation respectively. Factor 7 has high loadings on activities related to research and development and on highly qualified employees, which support knowledge-intensive types of production. It therefore relates to the science-based innovation pattern in Pavitt's taxonomy. Factor 8 is defined by its high loading on health related services.

Table 7 provides descriptive statistics for the eight industrial factors and the factor that measures remoteness and provides labels for the eight industrial factors. The statistics are presented separately for districts from Germany's east and west because there remains a clear east-west divide in many socio-economic data even some decades after the German re-unification.

Table 7: Descriptive statistics and labels of the factors

	Mean		Std Dev		Min		Max	
Variable	West	East	West	East	West	East	West	East
f1 Professional service	0.16	-0.62	0.95	0.74	-1.16	-1.61	5.68	1.96
f2 Simple production	0.30	-1.16	0.77	0.70	-1.81	-2.99	2.81	0.29
f3 Primary and related production	-0.17	0.65	0.92	0.76	-1.94	-1.16	2.67	2.39
f4 Large scale production	0.14	-0.53	1.00	0.51	-1.71	-1.55	5.69	1.44
f5 Trade service and food	0.08	-0.31	0.96	0.70	-3.14	-2.13	2.39	1.38
f6 Recreation service	-0.10	0.37	0.77	1.41	-1.24	-0.83	5.17	10.56
f7 Knowledge intensive production	-0.04	0.14	0.97	0.72	-2.19	-0.60	6.02	4.08
f8 Health service	0.03	-0.10	0.92	0.81	-3.34	-2.06	4.29	1.68
f Remoteness	-0.11	0.44	0.80	0.86	-2.12	-2.03	2.98	3.01

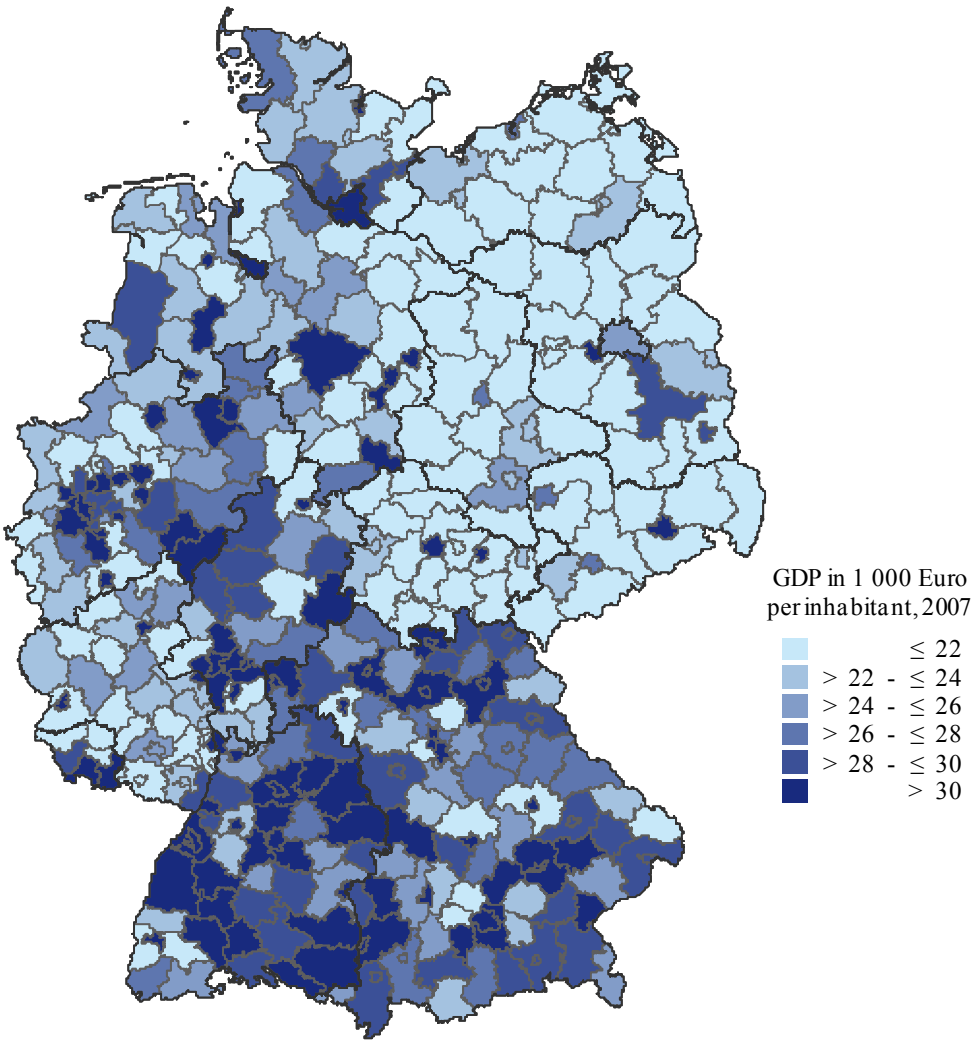
West: N = 295; East: N = 74.

Source: Own calculation.

2.2 Economic fundamentals of German regions

The east-west divide in the six socio-economic indicators (Table 1) becomes evident in the following maps. The patterns apparent in these maps shall subsequently be explained by remoteness and local industrial structure in the following chapters. In the regression, an east-west dummy variable will be introduced in order to control for those differences that are probably caused by the historical differences in both German parts. Maybe the most fundamental economic indicator showing "regional productivity" is the GDP per inhabitant (Map 2). The map shows that there is not only a east-west divide but also a north-south divide in this respect.

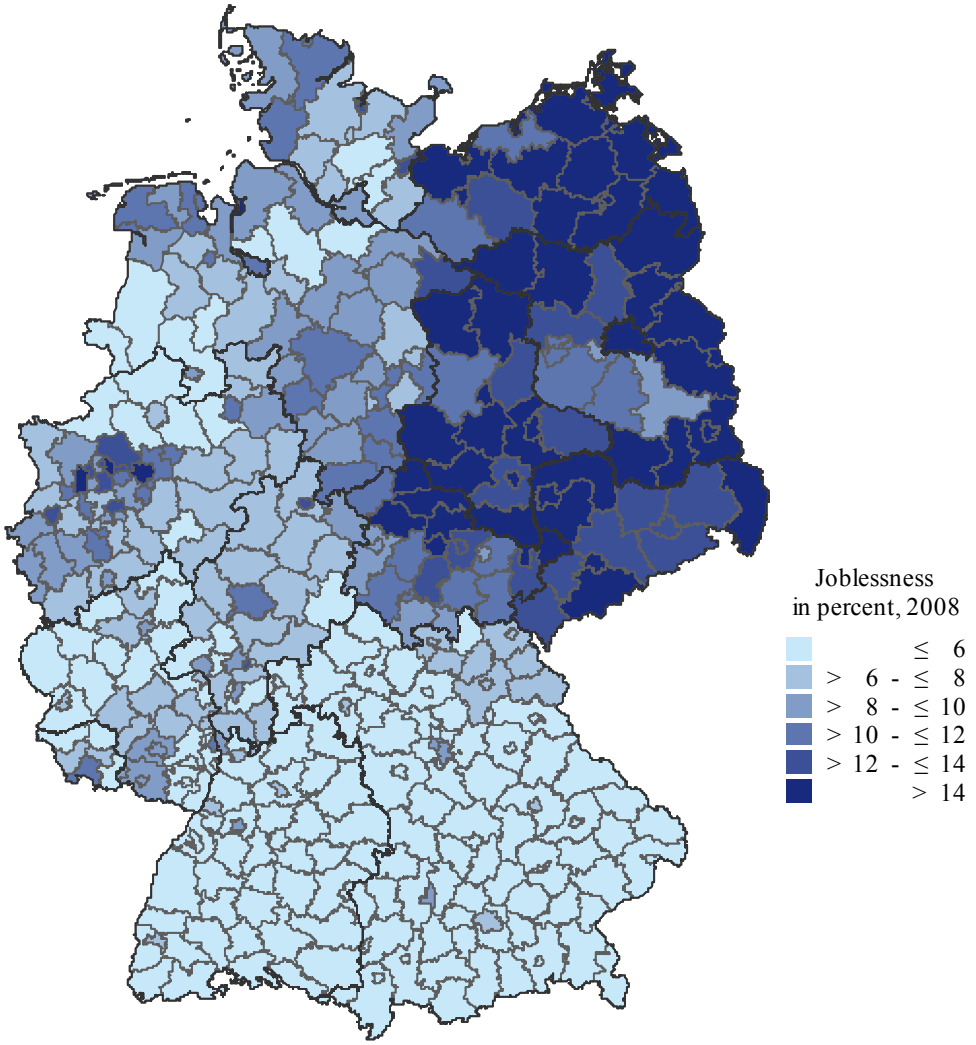
Map 2: Gross domestic product per inhabitant in German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

Another fundamental indicator is local joblessness, which is obviously intimately related to local GDP (Map 3).

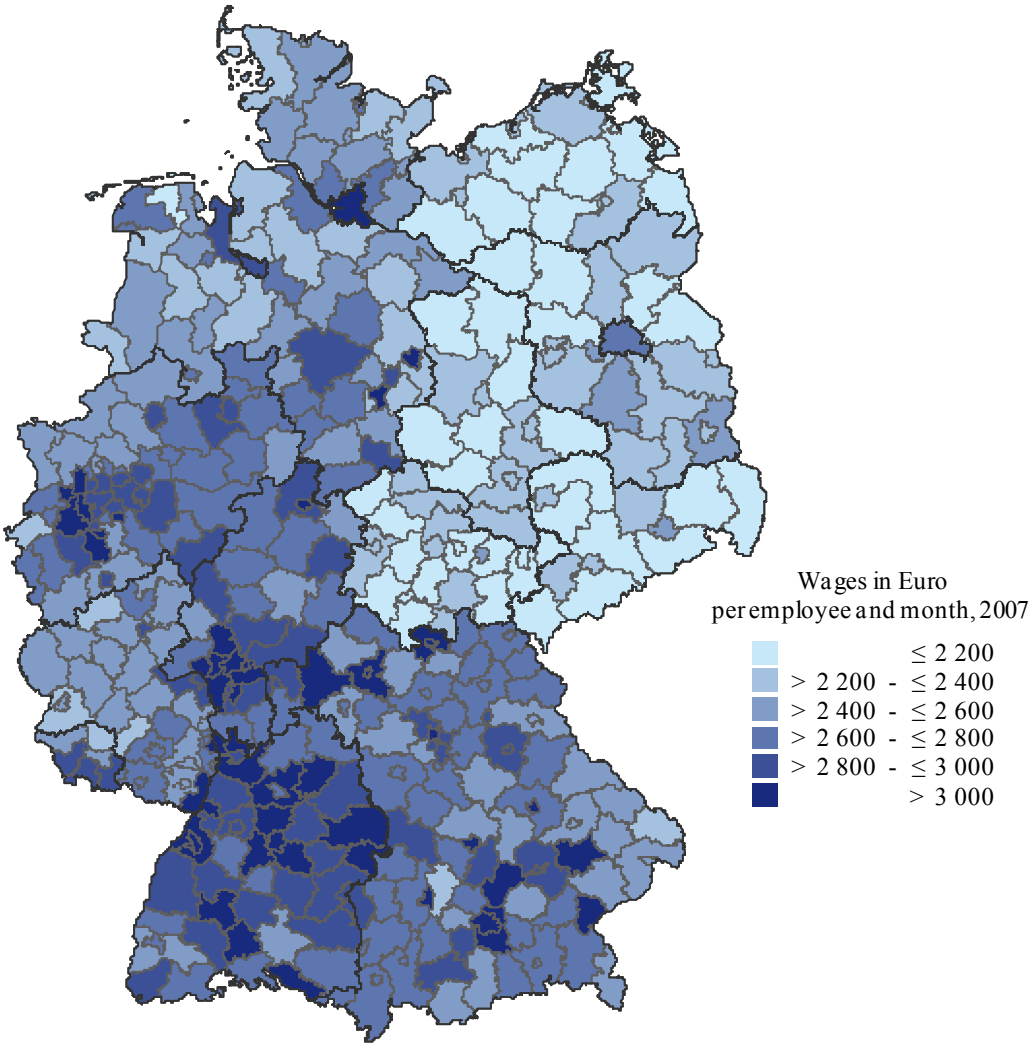
Map 3: Joblessness in German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

Wages should be at least partially explainable in terms of productivity and supply and demand for labour. At first glance, they seem to mirror joblessness and GDP pretty well (Map 4), but at second glance, a number of districts can be identified, where relatively high joblessness goes along with relatively high wages. This is a hint at the existence of split labour markets.

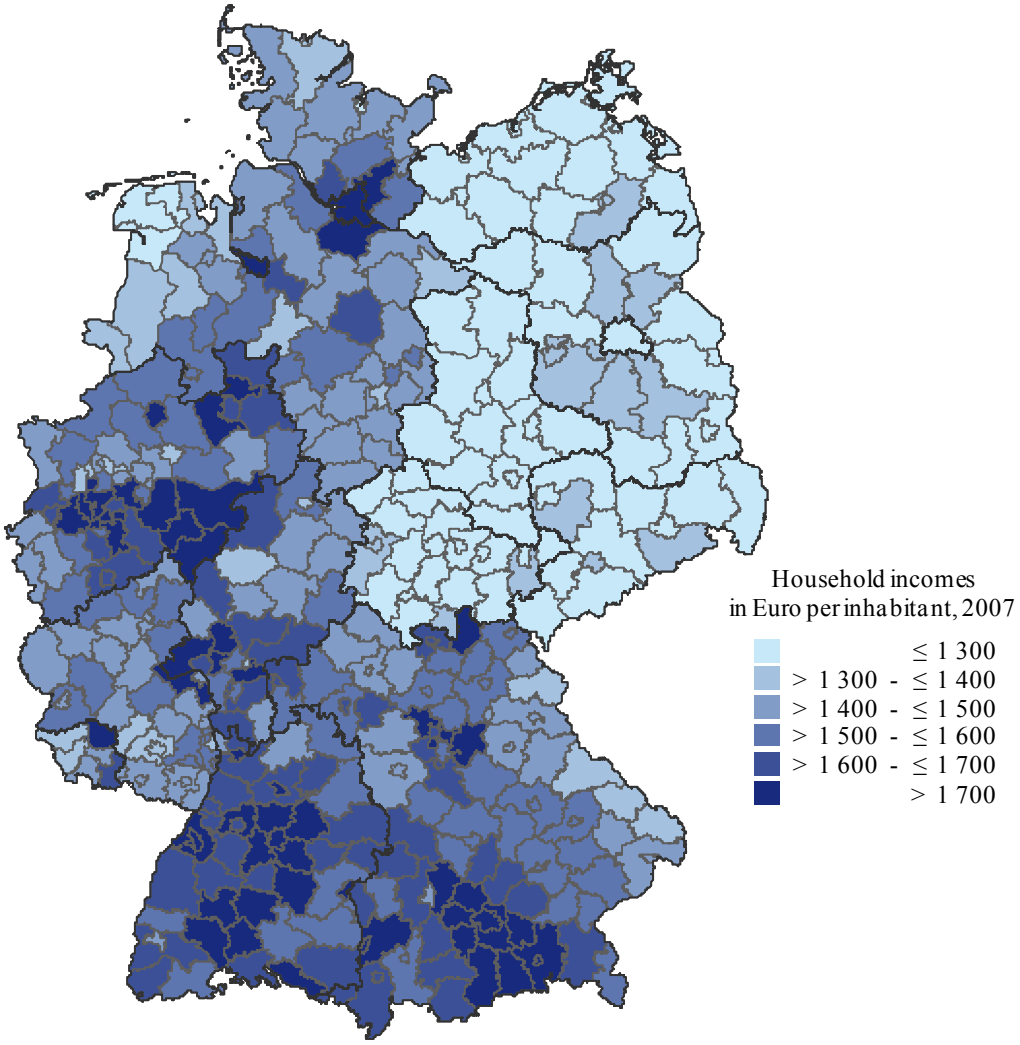
Map 4: Wage level in German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

Household income depends on the wages and on labour market participation (Map 5). The geographical distribution shows that other factors, like segregation among different population groups, probably contribute to the distribution of household incomes as well. The composition of residents differs between typical commuter districts and other districts, for example. The generally low level of household income in the east that seems to be nearly unaffected by geographical factors is striking.

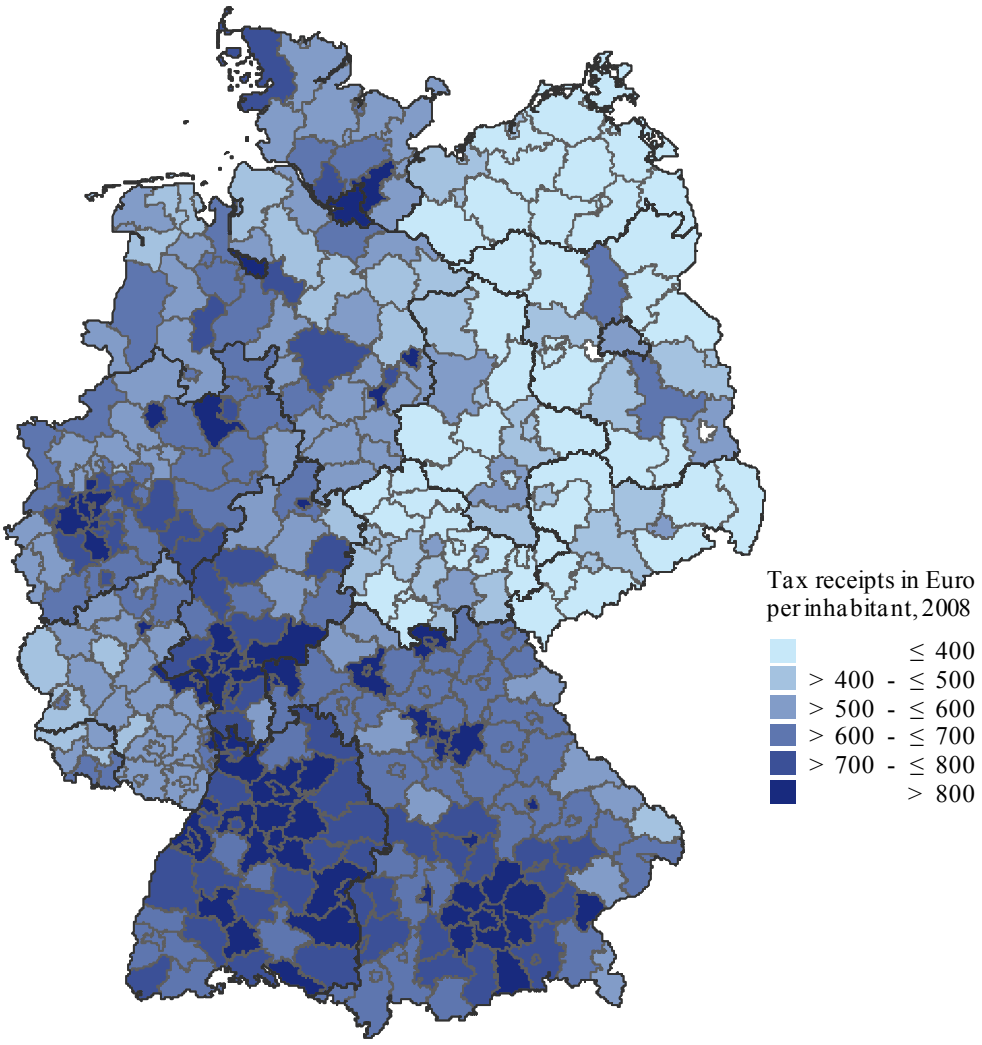
Map 5: Mean household incomes in German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

Tax payments are expected to depend upon income and productivity. Map 6 seems to confirm the close relation between local tax receipts and household income and productivity.

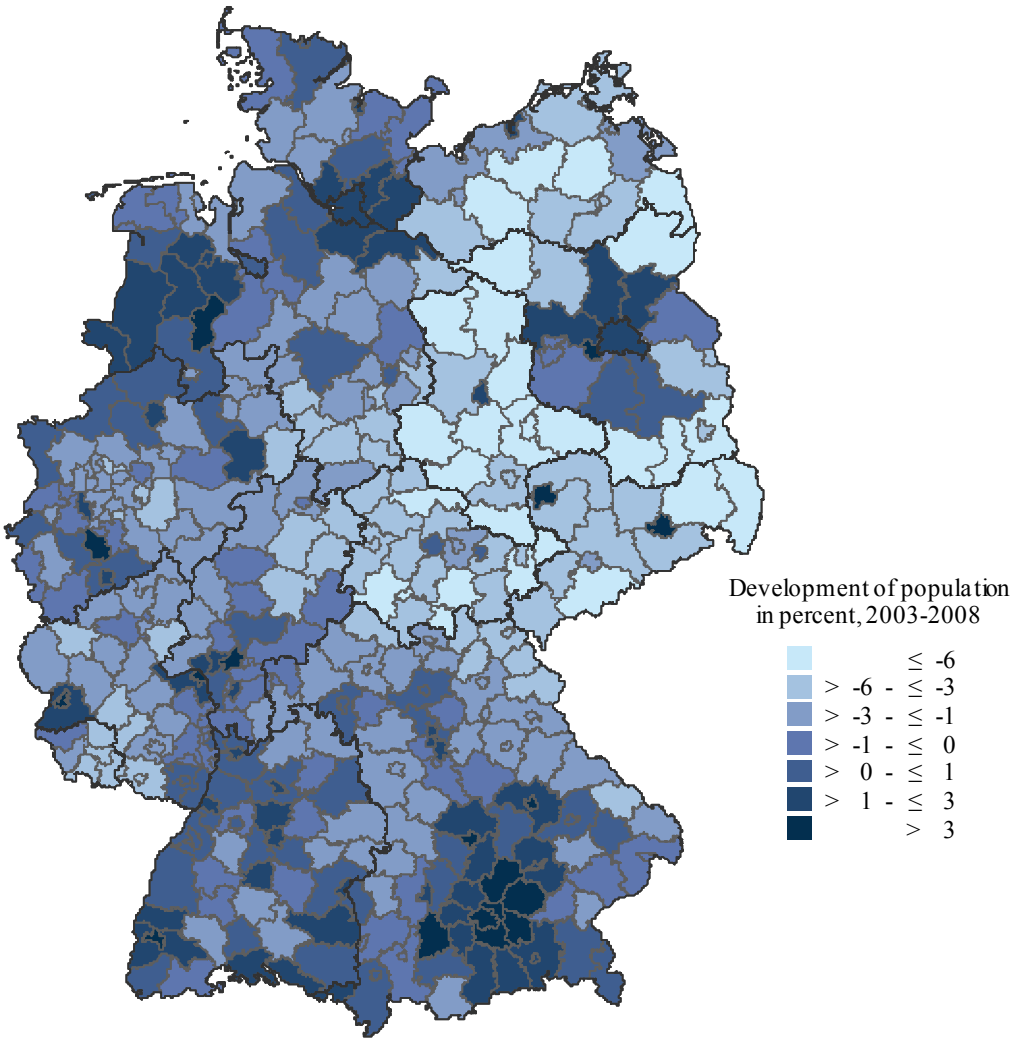
Map 6: Tax receipts from German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

The demographic development, finally, is expected to be a function of all other socio-economic indicators (Map 7). Actually a simple one-to-one match to the other indicators does not become evident from the simple graphical comparison of the maps. This observation hints at the complex interplay among many different factors that possibly explain people's migrations.

Map 7: Population development in German districts (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

3 Estimation: The relation between industrial structure and economic fundamentals

We analyse statistically the relation between the socio-economic situation as depicted by the indicators described in the last chapter on the one hand and the industrial structure on the other. The economic fundamentals are not independent from each other. Accordingly, if one wishes to comprehensively address the relation between industrial structure and the local socio-economic situation as it is depicted by the six indicators, a simultaneous estimation approach needs to be applied that accounts for the indicators' partial endogeneity. Here, the model is formulated in a mediation approach, which allows direct impacts of variables as well as indirect effects, i.e., effects that are mediated by another additional variable, to be tested against each other. The construction of the model to be estimated is guided by a simple logic of causation: It is assumed that the local economic productivity, indicated by GDP per inhabitant, is the most fundamental indicator determined by industrial structure. The GDP in turn partly determines unemployment, both are influential upon wages. GDP, unemployment and wages partly determine household income, all of them influence local tax revenues, and finally, regional demographic development depends upon all the other variables. Additionally, each of the socio-economic indicators is assumed to be directly affected by industrial structure. Accordingly, each of the indicators besides GDP is additionally indirectly influenced by industrial structure via its dependence on the other variables in the chain. Finally, each of these effects is allowed to differ between agglomerated and peripheral regions (remoteness). In all regressions a west-east dummy is included in order to control for the historically caused fundamental differences in industry, employment and demographic structures between regions in the former West and East Germanys.

3.1 Assumed functional chain

At the beginning, linear ordinary least squares (OLS) regressions were run without industrial structure in order to assess the assumed relation between BIP, unemployment, wages, household incomes, tax revenues and demographic development (Table 8). The fundamental difference between the eastern and western German regions is controlled for and effects are allowed to differ between agglomerated and peripheral regions by the inclusion of interaction terms. The principal model structure is depicted in the following equation:

$$SocioEconomic_n = \beta_{n0} + \beta_{n1} West + \beta_{n2}\,\mathrm{Re}\,mote + \sum_{1}^{m}\left[\beta_{n;m+2} SocioEconomic_m + \beta_{n;m+3} SocioEconomic_m\,\mathrm{Re}\,mote\right] + e_n \quad (1)$$

with $SocioEconomic_n$ as the nth socio-economic indicator to be explained within the hierarchical model structure, β_{n0} as the estimated coefficients and e_n as the error term of the estimation. In Table 8 in each model that explains one of the six socio-economic indicators, the left column

shows the estimated effects of the other socio-economic indicators in regions of medium location and the right column, labeled "remote", shows the change in the coefficient for more remote or more central districts. Accordingly, the marginal effect of *Tax* upon *Population* in central districts with *Remote = -1* is *δPopulation / δTax =0.000 + 0.005*(-1)=-0.005*; the marginal effect of *Tax* upon population in remote districts with *Remote = 1* is *δPopulation/ δTax =0.000 + 0.005*(1)=0.005.* The relation between tax revenues and population development might be negative in central regions due to a cost-of-living effect. In remote districts, high tax revenues primarily indicate relative public wealth and relate positively to population development.

Table 8: Hierarchical estimation of isolated OLS models

	GDP	Remote	Jobless	Remote	Wage	Remote	Income	Remote	Tax	Remote	Population	Remote
_cons	23.1 ***	-5.1 ***	13.1 ***	-1.4 ***	2,432.2 ***	-52.4 ***	1,435.7 ***	-54.9 ***	667.4 ***	-13.9 °	-1.946 ***	-0.923 ***
	(1.01)	(0.55)	(0.38)	(0.19)	(29.0)	(14.0)	(23.1)	(10.5)	(16.2)	(7.5)	(0.369)	(0.173)
Tax											0.006 ***	0.005 ***
											(0.001)	(0.001)
Income									0.4 ***	-0.1	-0.001	0.000
									(0.0)	(0.0)	(0.001)	(0.001)
Wage							0.1 *	0.1	0.2 ***	0.0	-0.002 *	0.000
							(0.0)	(0.0)	(0.0)	(0.0)	(0.001)	(0.001)
Jobless					-0.5	7.8 **	-20.1 ***	10.5 ***	-9.7 ***	-0.8	-0.269 ***	0.044
					(3.3)	(2.7)	(2.5)	(2.1)	(1.9)	(1.7)	(0.045)	(0.039)
GDP			-0.17 ***	-0.16 ***	27.0 ***	7.1 ***	2.1	1.1	7.3 ***	-1.4	-0.001	-0.118 ***
			(0.02)	(0.02)	(1.7)	(1.6)	(1.7)	(1.7)	(1.2)	(1.2)	(0.030)	(0.033)
West	5.36 ***		-6.90 ***		307.8 ***		103.5 ***		-39.3 *		0.789 °	
	(1.14)		(0.39)		(34.2)		(27.9)		(19.6)		(0.448)	
r2		0.28		0.63		0.78		0.62		0.85		0.55
p		0.000		0.000		0.000		0.000		0.000		0.000

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Working with interaction effects introduces some specific difficulties in the interpretation of coefficients as the different coefficients need to be combined, and the effect often depends on the level of the intervening variable itself. Standard errors, too, need to be corrected taking into account the correlation of variables with the interacted terms. In the calculation of the significance of estimated overall effects the covariance between distinct estimators needs to be taken into account as outlined in Figure 1. We present marginal overall-effects whose combined significance is evaluated separately for each observation in the final model to be presented below. For the preliminary models presented here, we only demonstrate the calculation of the marginal effects exemplarily.

Figure 1: Marginal Effects and Variances for Various Interaction Models

Case	Equation	Marginal Effect	Variance
1a	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 XZ$	$\frac{\partial Y}{\partial X} = \beta_1 + \beta_3 Z$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + Z^2 var(\hat{\beta}_3) + 2Z cov(\hat{\beta}_1 \hat{\beta}_3)$
1b	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 XZ$	$\frac{\partial Y}{\partial Z} = \beta_2 + \beta_3 X$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_2) + X^2 var(\hat{\beta}_3) + 2X cov(\hat{\beta}_2 \hat{\beta}_3)$
2	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 W + \beta_4 XZ + \beta_6 ZW$	$\frac{\partial Y}{\partial X} = \beta_1 + \beta_4 Z$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + Z^2 var(\hat{\beta}_4) + 2Z cov(\hat{\beta}_1 \hat{\beta}_4)$
3	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 W + \beta_4 XZ + \beta_5 XW + \beta_6 ZW$	$\frac{\partial Y}{\partial X} = \beta_1 + \beta_4 Z + \beta_5 W$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + Z^2 var(\hat{\beta}_4) + W^2 var(\hat{\beta}_5) + 2Z cov(\hat{\beta}_1 \hat{\beta}_4) + 2W cov(\hat{\beta}_1 \hat{\beta}_5) + 2ZW cov(\hat{\beta}_4 \hat{\beta}_5)$
4	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 W + \beta_4 XZ + \beta_5 XW + \beta_6 ZW + \beta_7 XZW$	$\frac{\partial Y}{\partial X} = \beta_1 + \beta_4 Z + \beta_5 W + \beta_7 ZW$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + Z^2 var(\hat{\beta}_4) + W^2 var(\hat{\beta}_5) + Z^2 W^2 var(\hat{\beta}_7) + 2Z cov(\hat{\beta}_1 \hat{\beta}_4) + 2W cov(\hat{\beta}_1 \hat{\beta}_5) + 2ZW cov(\hat{\beta}_1 \hat{\beta}_7) + 2ZW cov(\hat{\beta}_4 \hat{\beta}_5) + 2WZ^2 cov(\hat{\beta}_4 \hat{\beta}_7) + 2ZW^2 cov(\hat{\beta}_5 \hat{\beta}_7)$

Case	Equation	Marginal Effect	Variance
1	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2$	$\frac{\partial Y}{\partial X} = \beta_1 + 2\beta_2 X$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + 4X^2 var(\hat{\beta}_2) + 4X cov(\hat{\beta}_1 \hat{\beta}_2)$
2	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2 + \beta_3 Z$	$\frac{\partial Y}{\partial X} = \beta_1 + 2\beta_2 X$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + 4X^2 var(\hat{\beta}_2) + 4X cov(\hat{\beta}_1 \hat{\beta}_2)$
3a	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2 + \beta_3 Z + \beta_4 XZ$	$\frac{\partial Y}{\partial X} = \beta_1 + 2\beta_2 X + \beta_4 Z$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + 4X^2 var(\hat{\beta}_2) + Z^2 var(\hat{\beta}_4) + 4X cov(\hat{\beta}_1 \hat{\beta}_2) + 2Z cov(\hat{\beta}_1 \hat{\beta}_4) + 4XZ cov(\hat{\beta}_2 \hat{\beta}_4)$
3b	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2 + \beta_3 Z + \beta_4 XZ$	$\frac{\partial Y}{\partial Z} = \beta_3 + \beta_4 X$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial Z}} = var(\hat{\beta}_3) + X^2 var(\hat{\beta}_4) + 2X cov(\hat{\beta}_3 \hat{\beta}_4)$
4a	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2 + \beta_3 Z + \beta_4 XZ + \beta_5 X^2 Z$	$\frac{\partial Y}{\partial X} = \beta_1 + 2\beta_2 X + \beta_4 Z + 2\beta_5 XZ$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial X}} = var(\hat{\beta}_1) + 4X^2 var(\hat{\beta}_2) + Z^2 var(\hat{\beta}_4) + 4X^2 Z^2 var(\hat{\beta}_5) + 4X cov(\hat{\beta}_1 \hat{\beta}_2) + 2Z cov(\hat{\beta}_1 \hat{\beta}_4) + 4XZ cov(\hat{\beta}_2 \hat{\beta}_4) + 4XZ cov(\hat{\beta}_1 \hat{\beta}_5) + 8X^2 Z cov(\hat{\beta}_2 \hat{\beta}_5) + 4XZ^2 cov(\hat{\beta}_4 \hat{\beta}_5)$
4b	$\hat{Y} = \beta_0 + \beta_1 X + \beta_2 X^2 + \beta_3 Z + \beta_4 XZ + \beta_5 X^2 Z$	$\frac{\partial Y}{\partial Z} = \beta_3 + \beta_4 X + \beta_5 X^2$	$\hat{\sigma}^2_{\frac{\partial Y}{\partial Z}} = var(\hat{\beta}_3) + X^2 var(\hat{\beta}_4) + X^4 var(\hat{\beta}_5) + 2X cov(\hat{\beta}_3 \hat{\beta}_4) + 2X^2 cov(\hat{\beta}_3 \hat{\beta}_5) + 2X^3 cov(\hat{\beta}_4 \hat{\beta}_5)$

Source: Aiken and West (1991) and https://files.nyu.edu/mrg217/public/interaction.html#code

With the derivation by the socio-economic explanatory variables one receives for our model as the marginal effect of the m-th socio-economic indicator upon the n-th socio-economic indicator conditional upon remoteness:

$$\delta SocioEconomic_n / \delta SocioEconomic_m = \beta_{n;m+2} + \beta_{n;m+3} \,\mathrm{Re}\, mote\,, \qquad (2)$$

i.e., the total effect of the interacted explanatory socio-economic indicator equals the sum of the two related coefficients, whereas the second needs to be multiplied by the value of the interacted factor "remoteness". "Remoteness" has the mean value of zero and a standard-deviation of one, such that its value can be assumed to be minus one for central regions and plus one for remote regions. Thereby, the total effect of the relation between the socio-economic indicators is allowed to differ between central and remote regions.

There are significant differences in GDP per inhabitant between east and west and between central and remote regions. In the east, average GDP per inhabitant ("productivity") is 23,1 Thousand Euro in regions that are neither central nor remote (Table 8). In the west, it is 5,36 Thousand Euro higher. In remote [central] regions, in contrast, regional productivity is 5,1 Thousand Euro lower [higher] in the mean. The differentiation by centrality and by east-west is highly significant and the resulting simple model reaches an R-square of 0.28. Joblessness, which is explained in the next model, declines as expected with productivity. Nevertheless, according to Equation (2) and the accompanying annotation, there is no observable relation between GDP and joblessness in central regions:

$$\delta Jobless/\delta GDP = -0.17 - (0.16 * -1) = -0.01$$

In remote regions, on the contrary, the effect is even larger:

$$\delta Jobless/\delta GDP = -0.17 - (0.16 * 1) = -0.33$$

Moreover, unemployment as measured by the indicator, is lower in remote than in central regions and it is lower in the west than in the east. According to R-square, the model explains 63% of the variance in unemployment between districts.

Wages (third model) rise with productivity, and again, the relation to productivity is stronger in remote regions. Nevertheless, in absolute terms, wages are significantly lower in remote regions. There is a negative relation between unemployment and wages in central regions. This supports the assumed causal direction from unemployment to wages, as wages are low, where unemployment and therefore the potential supply of labour is high. Nevertheless, for peripheral regions the relation is positive: Wages are high where unemployment is high. This would rather support the reversed causal direction, as high unemployment could not cause high wages, but high wages could cause high unemployment if they indicate a split labour market and the exclusion of less qualified labour. Wages are much higher in the west than in the east. The east-west dummy, unemployment and regional productivity and the differentiation by centrality according to R-square explain 78% of the observed variance in wages.

Household income (fourth model) shows a similar pattern as wages. Nevertheless, the advantage of the west is lower than for wages, while the difference between central and peripheral regions is for household income about the same as for wages. Controlling for unemployment and wages,

household income is not related to regional productivity and it shows only a slight positive relation to wages. There is a highly significant negative relationship between unemployment and household income, which stresses the relevance of labour market participation and its affectedness by joblessness. The negative relation is much stronger for central regions, though, than for peripheral regions. Nevertheless, other factors are expected to affect labour market participation, specifically of women as well, for example, the availability of child care facilities and the quality of jobs and their flexibility.

The fifth model explains the districts' tax revenues per inhabitant. Here, remoteness plays a minor role, even though tax revenues seem to be slightly lower in peripheral than in central regions. The relation between household income, wages, unemployment and GDP per inhabitant on the one hand and tax revenues on the other show the expected signs. Nevertheless, the difference between east and west, while less significant than for those indicators discussed before, is rather unexpected: After controlling economic fundamentals, tax revenues are lower in the west than in the east. One possible explanation could be in the municipal trade tax reallocation mechanism, which imposes a net transfer from municipalities with high tax revenues to municipalities with low tax revenues and additionally imposes higher contributions upon western than eastern regions. Tax revenues are explained very well by economic fundamentals, as the model has an R-square of 0.85.

The last model explains population development by economic fundamentals. The explanatory power of this model is, as expected, not quite as good as for the earlier economic fundamentals. Nevertheless, with an R-square of 0.55 it is still rather satisfactory. After controlling the impact of the economic fundamentals, the significance of the west-east difference is only significant on a 10-percent level. The difference between central and peripheral regions seems to be more significant. Rather unexpectedly, having controlled the other economic fundamentals, we observe a negative relation between wages and population development in this incomplete model, i.e., higher wages come along with a higher loss of population. This unexpected result will disappear once the model is fully specified (see below). In the same vein, a higher GDP per inhabitant goes along with a higher loss of population in peripheral regions, while it is accompanied with a more positive population development in central regions. These results seem to support the notion of split labour markets and social segregation, which has also been discussed for the relation between wages and unemployment in peripheral regions. Tax revenues show a positive relation to population development and unemployment a negative relation. Both thereby have the expected sign. The positive impact of tax revenue upon population development is insignificant for central regions and especially strong for peripheral regions. One rationale for this observation might be that in peripheral regions without positive agglomeration effects the provision of facilities and institutions of daily life depends much more on public activities than in central regions.

3.2 Model specification and evaluation

The economic fundamentals have also been explained by industrial structure, the west-east dummy and remoteness alone. The respective models (Table 9) capture the gross relation between industrial structure and the regional socio-economic situation, i.e., the combined direct and indirect relations between industrial structure and socio-economic indicators. The eight factors (f1 to f8 in Table 9) that describe the regional industrial structures (Tables 7 and 8) are interacted with the factor that describes remoteness and also with each of the other industry-factors (f2f1, f2fy, ..., f3f2, f3fy, ..., fxfy, ..., f8f7 in Table 9) in order to analyse the implication of "mixed" regional industrial structures.

$$\begin{aligned} SocioEconomic_n &= \beta_{n0} + \beta_{n1} West + \beta_{n2}\,\mathrm{Re}\,mote \\ &+ \beta_{n3} Industry_j + \sum_{1}^{i}\left[\beta_{n;i+3} Industry_j\, Industry_i\right] \\ &+ \beta_{n11} Industry_j\,\mathrm{Re}\,mote + \sum_{1}^{i}\left[\beta_{n;i+11} Industry_j\, Industry_i\,\mathrm{Re}\,mote\right] + e_n \end{aligned} \tag{3}$$

With the derivation by a specific industry, one receives as estimated relation between a marginal change in industrial structure and a marginal change in the socio-economic indicator:

$$\begin{aligned} \delta SocioEconomic_n / \delta Industry_j &= \beta_{n3} + \sum_{1}^{i}\left[\beta_{n;i+3} Industry_i\right] \\ &+ \beta_{n11}\,\mathrm{Re}\,mote + \sum_{1}^{i}\left[\beta_{n;i+11} Industry_i\,\mathrm{Re}\,mote\right] \end{aligned} \tag{4}$$

which implies that the relation depends on the remoteness and on the value of the other industrial factors. As the mean value of remoteness and of the other industrial factors is zero, the first coefficient in Equation (4) expresses the relation if all other values are assumed to have their mean value.

Table 9: Gross relation between economic fundamentals, remoteness and industries

		GDP	Remote	Jobless	Remote	Wage	Remote	Income	Remote	Tax	Remote	Population	Remote
_cons		20.87 ***	0.95	12.13 ***	0.25	2,306.0 ***	-1.1	1,383.9 ***	-25.3	440.7 ***	-7.3	-3.601 ***	0.075
		(1.44)	(0.71)	(0.63)	(0.31)	(37.5)	(18.5)	(32.3)	(15.9)	(30.9)	(14.8)	(0.588)	(0.290)
f1	Professional service	1.72 *	-0.20	0.17	0.21	51.1 **	-61.2 *	52.6 **	19.4	61.8 ***	-57.3 **	0.502 °	0.258
		(0.73)	(0.99)	(0.32)	(0.43)	(19.2)	(25.8)	(16.5)	(22.2)	(15.5)	(21.1)	(0.300)	(0.405)
f2	Simple production	0.78	-0.48	-2.25 ***	0.25	59.1 ***	30.4 °	85.3 ***	-4.9	49.4 ***	2.8	0.222	-0.413
		(0.58)	(0.65)	(0.26)	(0.28)	(15.3)	(17.0)	(13.1)	(14.6)	(12.4)	(13.7)	(0.239)	(0.266)
f3	Primary and related production	-1.50 *	0.55	-0.34	1.24 ***	-57.9 ***	-44.1 *	-20.0	22.3	-9.4	-29.5 *	-0.701 **	-0.539 *
		(0.63)	(0.66)	(0.28)	(0.29)	(16.4)	(17.1)	(14.2)	(14.7)	(13.9)	(13.8)	(0.258)	(0.268)
f4	Large scale production	0.28	0.46	0.37 °	0.54 °	48.3 ***	38.9 *	-28.2 *	5.0	-17.4 °	-1.1	-0.265	-0.157
		(0.49)	(0.68)	(0.21)	(0.30)	(12.7)	(17.8)	(11.0)	(15.3)	(10.3)	(14.4)	(0.199)	(0.279)
f5	Trade service and food	-3.01 ***	1.38 °	-0.38 °	-0.52	-112.3 ***	14.6	-7.8	-8.0	-33.2 **	13.4	0.663 **	0.254
		(0.52)	(0.77)	(0.23)	(0.34)	(13.5)	(20.2)	(11.6)	(17.4)	(11.0)	(16.3)	(0.211)	(0.316)
f6	Recreation service	-1.62 *	2.01 *	-0.78 *	0.65	-68.6 ***	87.7 ***	24.9	-15.8	-25.2 °	36.3 °	0.625 *	0.308
		(0.72)	(0.94)	(0.32)	(0.41)	(18.9)	(24.5)	(16.3)	(21.1)	(15.3)	(20.0)	(0.296)	(0.384)
f7	Knowledge intensive production	1.55 **	2.18 *	-0.70 **	-0.14	85.2 ***	46.6 °	44.8 ***	24.7	70.2 ***	51.5 *	0.767 ***	0.101
		(0.55)	(1.08)	(0.24)	(0.47)	(14.3)	(28.2)	(12.3)	(24.3)	(11.6)	(22.7)	(0.224)	(0.442)
f8	Health service	0.45	-1.07	0.75 ***	0.29	-23.8 °	5.7	-29.7 **	-0.4	-28.6 **	1.3	-0.767 ***	-0.782 *
		(0.50)	(0.75)	(0.22)	(0.33)	(13.1)	(19.6)	(11.3)	(16.9)	(10.5)	(15.7)	(0.205)	(0.306)
f2f1		-0.63	1.30	0.21	0.06	57.1 **	51.7 *	24.0	30.5 °	32.8 *	48.4 **	-0.440	0.004
		(0.74)	(0.81)	(0.32)	(0.35)	(19.3)	(21.1)	(16.6)	(18.2)	(15.5)	(17.1)	(0.303)	(0.331)
f3f1		-1.23	1.32 *	0.36	-0.07	2.8	-16.5	16.3	21.7	8.5	0.2	-0.018	-0.046
		(0.79)	(0.59)	(0.35)	(0.26)	(20.7)	(15.5)	(17.8)	(13.3)	(16.7)	(12.5)	(0.325)	(0.242)
f4f1		-0.37	-1.60 *	0.88 *	0.46	-41.4 °	-41.6 *	-32.8 °	-13.1	-43.2 *	-42.0 **	-0.186	-0.291
		(0.82)	(0.73)	(0.36)	(0.32)	(21.4)	(19.1)	(18.5)	(16.5)	(17.4)	(15.5)	(0.336)	(0.300)
f5f1		-0.39	-1.04	-0.44	-0.12	-5.4	-22.0	-2.4	-24.4	-5.1	-9.8	0.235	0.104
		(0.72)	(0.72)	(0.32)	(0.32)	(18.9)	(18.9)	(16.3)	(16.3)	(15.3)	(15.2)	(0.296)	(0.296)
f6f1		-0.77	0.06	-0.03	-0.14	-1.3	17.6	-28.7	31.5	34.8 °	-19.7	-0.566	-0.055
		(0.98)	(1.11)	(0.43)	(0.49)	(25.7)	(29.0)	(22.1)	(25.0)	(21.0)	(23.9)	(0.402)	(0.455)
f7f1		2.25 **	2.64 ***	-0.06	-0.10	25.7	-3.4	46.3 *	33.3 °	44.5 *	41.5 *	-0.223	-0.373
		(0.85)	(0.78)	(0.37)	(0.34)	(22.1)	(20.3)	(19.0)	(17.5)	(17.8)	(16.3)	(0.346)	(0.318)
f8f1		2.74 ***	1.17	-0.22	0.16	30.7 °	-15.9	0.2	18.5	51.2 ***	14.2	0.266	0.010
		(0.70)	(0.72)	(0.31)	(0.32)	(18.3)	(18.8)	(15.8)	(16.2)	(14.9)	(15.4)	(0.287)	(0.295)
f3f2		0.00	0.76	-0.10	-0.56 *	7.5	-10.6	-41.0 **	13.7	-19.4	25.8 *	0.166	0.232
		(0.67)	(0.51)	(0.29)	(0.22)	(17.6)	(13.2)	(15.1)	(11.4)	(15.0)	(10.9)	(0.275)	(0.207)
f4f2		0.90 °	-0.22	-0.67 **	-0.24	14.9	6.7	1.3	10.0	8.6	-3.6	0.439 *	0.125
		(0.46)	(0.61)	(0.20)	(0.27)	(12.1)	(15.9)	(10.4)	(13.7)	(9.7)	(12.8)	(0.189)	(0.248)
f5f2		-0.22	0.77	-0.16	-0.24	-32.6 *	3.1	1.7	7.2	-16.6	7.2	0.189	-0.376
		(0.49)	(0.66)	(0.22)	(0.29)	(12.9)	(17.1)	(11.1)	(14.8)	(10.5)	(13.8)	(0.202)	(0.268)
f6f2		-0.30	-0.35	-0.30	0.18	-11.6	24.5	15.3	4.6	0.6	15.3	0.055	0.081
		(0.61)	(0.71)	(0.27)	(0.31)	(16.1)	(18.7)	(13.8)	(16.1)	(13.9)	(15.8)	(0.252)	(0.293)
f7f2		-0.67	-0.50	0.09	-0.21	0.6	0.7	-19.8	-22.6	-33.5 **	-11.6	-0.566 *	-0.080
		(0.57)	(0.67)	(0.25)	(0.29)	(15.0)	(17.5)	(12.9)	(15.0)	(12.5)	(14.2)	(0.235)	(0.273)
f8f2		0.86 °	-1.94 **	-0.24	-0.29	4.3	-21.6	10.6	15.1	-9.7	-27.7 *	0.117	-0.194
		(0.47)	(0.61)	(0.21)	(0.27)	(12.3)	(15.9)	(10.6)	(13.7)	(9.9)	(12.8)	(0.193)	(0.250)

Table 9: Gross relation between economic fundamentals, remoteness and industries –Continued 1

	GDP	Remote	Jobless	Remote	Wage	Remote	Income	Remote	Tax	Remote	Population	Remote
f4f3	-0.60	0.05	0.52 *	-0.12	-26.4 *	-16.9	1.7	-0.7	-16.3	4.2	-0.200	-0.192
	(0.51)	(0.60)	(0.22)	(0.26)	(13.3)	(15.7)	(11.4)	(13.5)	(10.6)	(12.6)	(0.208)	(0.245)
f5f3	1.50 **	-0.78	-0.16	0.18	15.0	31.4 *	3.2	6.8	0.4	-1.5	0.190	-0.344
	(0.56)	(0.57)	(0.24)	(0.25)	(14.5)	(14.8)	(12.5)	(12.8)	(12.2)	(12.1)	(0.228)	(0.232)
f6f3	-0.88	0.04	0.11	-0.44	-16.4	-4.8	-44.3 *	18.7	-0.4	-7.1	-0.246	-0.026
	(0.82)	(0.76)	(0.36)	(0.33)	(21.5)	(19.7)	(18.5)	(17.0)	(18.1)	(17.6)	(0.337)	(0.309)
f7f3	-0.42	-0.23	0.37	0.71 *	-20.9	-21.6	2.0	12.9	-30.9 °	-0.1	-0.427	-0.506
	(0.86)	(0.78)	(0.38)	(0.34)	(22.5)	(20.3)	(19.3)	(17.5)	(18.1)	(16.3)	(0.352)	(0.318)
f8f3	0.79	0.75	-0.41	-0.04	43.7 **	-23.4	29.0 *	21.7	24.8 °	-1.8	0.226	0.317
	(0.62)	(0.66)	(0.27)	(0.29)	(16.2)	(17.3)	(14.0)	(14.9)	(13.1)	(14.0)	(0.254)	(0.271)
f5f4	-0.49	1.63 **	-0.57 **	-0.46 °	0.0	18.7	4.9	11.4	5.3	28.7 *	0.149	0.152
	(0.43)	(0.57)	(0.19)	(0.25)	(11.4)	(15.0)	(9.8)	(12.9)	(9.2)	(12.1)	(0.178)	(0.234)
f6f4	-1.08	2.31 **	0.33	0.18	-65.2 ***	72.7 **	-10.1	-17.8	-14.8	5.2	-0.080	0.630 °
	(0.70)	(0.89)	(0.31)	(0.39)	(18.2)	(23.3)	(15.7)	(20.0)	(14.9)	(19.0)	(0.285)	(0.365)
f7f4	0.29	1.61 **	-0.08	-0.30	25.5 *	-1.0	31.7 **	-4.6	-0.1	7.3	0.180	0.446 *
	(0.45)	(0.54)	(0.20)	(0.24)	(11.9)	(14.0)	(10.2)	(12.1)	(9.5)	(11.3)	(0.186)	(0.220)
f8f4	-0.06	-0.98 °	0.14	0.14	-14.4	-26.5 °	-10.5	0.1	-7.8	-13.7	-0.009	-0.421 °
	(0.43)	(0.58)	(0.19)	(0.26)	(11.1)	(15.2)	(9.6)	(13.1)	(9.0)	(12.2)	(0.174)	(0.239)
f6f5	-0.30	0.87	0.07	-0.27	-9.7	12.5	7.2	17.9	17.0	19.9	-0.095	0.176
	(0.65)	(0.87)	(0.28)	(0.38)	(17.0)	(22.6)	(14.6)	(19.5)	(14.4)	(18.9)	(0.266)	(0.354)
f7f5	-0.45	1.49 °	-0.15	-0.93 *	21.2	17.6	14.8	20.5	-11.4	-9.7	-0.188	0.025
	(0.52)	(0.84)	(0.23)	(0.37)	(13.7)	(22.0)	(11.8)	(19.0)	(11.1)	(17.8)	(0.214)	(0.345)
f8f5	-1.38 *	0.95	0.11	-0.40	-20.4	6.5	-9.9	10.6	-26.7 *	6.7	-0.150	0.121
	(0.55)	(0.70)	(0.24)	(0.30)	(14.4)	(18.2)	(12.4)	(15.7)	(11.6)	(14.6)	(0.226)	(0.285)
f7f6	-0.32	1.07	-0.04	-0.04	-19.1	14.4	33.3 *	-52.4 *	13.0	7.5	0.051	0.494
	(0.68)	(1.04)	(0.30)	(0.46)	(17.7)	(27.2)	(15.2)	(23.5)	(14.3)	(22.4)	(0.277)	(0.427)
f8f6	0.25	-0.32	-0.19	0.28	-9.2	5.8	29.6 *	-33.7 *	-7.4	-5.7	0.124	-0.005
	(0.57)	(0.63)	(0.25)	(0.28)	(14.9)	(16.5)	(12.8)	(14.2)	(11.9)	(13.4)	(0.233)	(0.259)
f8f7	-1.14 *	1.34 *	-0.21	-0.15	3.8	9.0	23.0 *	17.5	-15.7	12.3	0.150	0.157
	(0.50)	(0.63)	(0.22)	(0.27)	(13.2)	(16.4)	(11.3)	(14.1)	(10.6)	(13.1)	(0.206)	(0.256)
West	4.63 **		-5.22 ***		384.1 ***		162.2 ***		211.5 ***		2.940 ***	
	(1.61)		(0.70)		(42.1)		(36.2)		(35.0)		(0.659)	
r2		0.86		0.85		0.92		0.81		0.86		0.69
p		0.000		0.000		0.000		0.000		0.000		0.000

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Despite the fact that the other economic fundamentals are not controlled for but instead indicators for industrial structure, intercepts and west-east dummies are rather comparable to those of the first group of models discussed in the context of Table 8. The main difference lies in the now higher tax revenue realised in western regions. At the same time, the explanatory power of these models is even higher than that of the first models, a fact that might mainly be attributable to the much larger number of parameters in the second model.

According to the results, GDP per inhabitant is highest where professional services (f1) or knowledge-intensive production (f7) dominate. The positive relation of the latter to regional productivity does not apply for central regions, though, as can easily be shown by inserting the coefficients from Table 9 into Equation 4 and assuming mean values for all other factors:

$$\delta GDP/\delta F7 = 1.55 + (2.18 * -1) = -1.63$$

GDP per inhabitant is lowest where services in trade (f5) are dominant, and it is also rather low where primary and related production (f3) or recreation services (f6) are characteristic. The negative relation between recreation service and GDP does not apply for peripheral regions, though.

The positive contribution of f1 and f7 to regional productivity is even higher, where both of them occur in combination:

$$\delta GDP/\delta F7 = 1.55 + (2.25 * 1) = 3.8$$

in medium locations with one positive standard deviation (+1) as expression of higher relevance of industrial factor F1. Again, this does not hold true for central regions:

$$\delta GDP/\delta F7 = 1.55 + (2.25 * 1) + (2.18 * -1) + (2.64 * -1) = -1.02$$

with one negative standard deviation (-1) as expression of centrality in the factor for remoteness.

Professional services are also even more positively related to GDP per inhabitant when health service is a characteristic industry in the region. In regions characterised by large scale production, GDP is higher in peripheral and lower in central regions if large scale production is accompanied by trade or recreation service or knowledge-intensive production.

Unemployment is lowest in regions with a relatively high importance of simple production. This relation holds especially true if simple production is accompanied by large scale production. Especially in peripheral regions, the negative relation between simple production and unemployment is stronger if the region is additionally characterised by primary and related production. A combination of large scale production and primary and related production, on the other hand, is rather detrimental for the unemployment situation. A combination between large

scale production and trade services goes along with lower unemployment, though. Especially in peripheral regions a combination of knowledge-intensive production and trade service goes along with lower unemployment as well. From all economic fundamentals, wages seem to be related most closely to the regional industry mix. Wages are highest in regions with knowledge-intensive production, followed by regions characterised by simple production, professional service and large scale production. Professional services are not positively related to wages in peripheral regions, though, while the positive relation between large scale production and wages does not seem to apply for central regions. Wages are lowest in regions characterised by trade services, followed by regions with relative important recreation service sectors and primary and related production. The negative relation between recreation services and wages does not hold true for peripheral regions, though, while the negative relation of wages to primary and related production does not apply to central regions.

The relation between household income and industrial structure is very similar to that between wages and industrial structure. Among the main differences is the rather negative relation between large scale production and household income per inhabitant in contrast to the rather positive relation between large scale production and wages. Regional tax revenues are highest where knowledge-intensive production is relatively important. This holds especially true for peripheral regions and hardly at all for central regions. Tax revenues are also especially high where professional services are of relative importance. This relation, contrary to that between knowledge intensive production and tax revenues, does not apply to peripheral regions but the more so to central regions. Simple production is positively related to tax revenues as well. Tax revenues are specifically low in regions characterised by trade services and by health services. A combination between professional service and simple production is extremely positively related to tax revenues while the partially positive relation between taxes and professional services is lost, where professional services are accompanied by a relatively high importance of large scale production. The positive contribution of knowledge intensive production to tax revenues is even higher with a high relative importance of professional service.

The gross relation between population development and industry structure is surprisingly high (R-square of 0.69). Population losses are highest where primary and related production or health services have a relatively high share. Both relations apply to peripheral regions but not so to central regions. Population development is rather positive in regions with a relatively high importance of trade and recreation services but especially in regions characterised by knowledge-intensive production.

From these results, the relation between the impact of industries upon certain socio-economic fundamentals and the impact upon other socio-economic fundamentals, i.e., the difference between direct and indirect relations, is not easily detectable. This comprehensive interpretation of the data is achieved with the moderated mediation model (Table 10). The first column of this integrated model elaborates upon the relation between industry structure and GDP per inhabitant and is identical with the first column in Table 9. The single models in the simultaneous

estimation represent a combination of the two regressions described above and in Equations (1) and (3). In this combined regression, the relationship between industrial structure and socio-economic indicators describes the direct or net relation, without those indirect relations that are attributable to the relations between the different socio-economic indicators. If the assumptions concerning the causal chain as depicted in the context with the first regression model (Table 8) are correct, then the mediation model allows for a separation of the direct and indirect effects.

Table 10: Hierarchical models from the seemingly unrelated regression

		GDP	Remote	Jobless	Remote	Wage	Remote	Income	Remote	Tax	Remote	Population	Remote
_cons		20.87 ***	0.95	11.29 ***	0.33	2,410.0 ***	5.6	1,464.2 ***	-34.2 *	623.9 ***	-6.7	-1.377 *	0.094
		(1.44)	(0.71)	(0.63)	(0.31)	(35.5)	(17.0)	(35.6)	(15.8)	(26.9)	(11.6)	(0.609)	(0.261)
Tax												0.000	0.005 *
												(0.001)	(0.002)
Income										0.1 **	0.0	-0.001	0.000
										(0.0)	(0.1)	(0.001)	(0.001)
Wage								0.0	0.1	0.2 ***	0.0	0.001	0.001
								(0.1)	(0.1)	(0.0)	(0.0)	(0.001)	(0.001)
Jobless						-4.5	0.3	-12.8 ***	4.8	-10.8 ***	-2.1	-0.449 ***	0.008
						(3.2)	(3.2)	(2.9)	(3.0)	(2.2)	(2.3)	(0.052)	(0.059)
GDP				-0.13 ***	-0.01	13.8 ***	6.4 ***	3.9 *	-1.1	8.4 ***	0.3	0.016	-0.081 *
				(0.03)	(0.03)	(1.6)	(1.9)	(1.7)	(2.0)	(1.2)	(1.5)	(0.031)	(0.037)
f1	Professional service	1.72 *	-0.20	0.38	0.22	33.6 *	-73.3 **	45.0 **	14.1	30.2 *	-33.0 °	0.668 *	0.102
		(0.73)	(0.99)	(0.31)	(0.42)	(17.1)	(23.0)	(15.9)	(23.1)	(11.9)	(17.5)	(0.273)	(0.398)
f2	Simple production	0.78	-0.48	-2.15 ***	0.22	37.9 *	24.1	51.3 ***	16.3	0.4	3.8	-0.689 **	-0.537 °
		(0.58)	(0.65)	(0.25)	(0.28)	(15.1)	(19.6)	(14.1)	(18.3)	(10.7)	(13.7)	(0.241)	(0.312)
f3	Primary and related production	-1.50 *	0.55	-0.53 *	1.29 ***	-41.2 **	-34.9 *	-14.2	36.8 *	3.3	-17.3	-0.823 ***	0.277
		(0.63)	(0.66)	(0.27)	(0.28)	(14.6)	(15.9)	(13.8)	(15.6)	(10.5)	(11.6)	(0.239)	(0.262)
f4	Large scale production	0.28	0.46	0.41 *	0.60 *	44.3 ***	34.2 *	-26.2 *	6.5	-21.8 **	-4.7	-0.307 °	0.077
		(0.49)	(0.68)	(0.21)	(0.29)	(11.2)	(15.7)	(10.6)	(15.3)	(7.9)	(11.3)	(0.183)	(0.257)
f5	Trade service and food	-3.01 ***	1.38 °	-0.76 ***	-0.37	-79.1 ***	5.4	5.1	-13.4	11.2	-5.6	0.705 ***	0.000
		(0.52)	(0.77)	(0.23)	(0.33)	(12.7)	(18.6)	(12.6)	(17.3)	(9.4)	(12.6)	(0.212)	(0.286)
f6	Recreation service	-1.62 *	2.01 *	-0.97 **	0.88 *	-57.9 ***	79.6 ***	23.0	-11.3	-11.0	14.9	0.470 °	0.741 *
		(0.72)	(0.94)	(0.31)	(0.40)	(17.0)	(22.2)	(16.0)	(21.2)	(11.8)	(15.6)	(0.266)	(0.352)
f7	Knowledge intensive production	1.55 **	2.18 *	-0.51 *	0.13	64.6 ***	21.9	25.0 *	10.1	28.0 **	21.3	0.334	-0.220
		(0.55)	(1.08)	(0.23)	(0.46)	(12.8)	(24.9)	(12.4)	(23.1)	(9.3)	(16.8)	(0.213)	(0.382)
f8	Health service	0.45	-1.07	0.79 ***	0.14	-19.8 °	27.0	-25.8 *	5.7	-14.3 °	12.8	-0.444 *	-0.413
		(0.50)	(0.75)	(0.21)	(0.32)	(11.9)	(17.4)	(11.0)	(16.0)	(8.1)	(11.7)	(0.183)	(0.267)
f2f1		-0.63	1.30	0.14	0.20	60.1 ***	44.4 *	29.6 °	23.2	29.0 *	29.5 *	-0.314	0.170
		(0.74)	(0.81)	(0.31)	(0.34)	(17.0)	(18.7)	(16.0)	(17.3)	(11.7)	(12.8)	(0.270)	(0.293)
f3f1		-1.23	1.32 *	0.21	0.07	15.9	-23.0	30.0 °	13.2	15.5	-11.5	0.260	-0.294
		(0.79)	(0.59)	(0.34)	(0.26)	(18.2)	(14.2)	(17.0)	(13.8)	(12.4)	(10.1)	(0.282)	(0.230)
f4f1		-0.37	-1.60 *	0.79 *	0.24	-15.3	-10.6	-18.0	-0.5	-24.1 °	-19.6 °	0.169	-0.141
		(0.82)	(0.73)	(0.36)	(0.32)	(19.7)	(17.2)	(18.2)	(15.9)	(13.3)	(11.6)	(0.303)	(0.268)
f5f1		-0.39	-1.04	-0.48	-0.24	-5.9	-12.3	-4.0	-21.7	-2.6	5.8	0.133	0.041
		(0.72)	(0.72)	(0.30)	(0.31)	(16.7)	(16.6)	(15.3)	(15.3)	(11.2)	(11.3)	(0.253)	(0.255)
f6f1		-0.77	0.06	-0.14	-0.11	10.5	6.1	-24.0	31.6	38.9 *	-22.6	-0.459	-0.202
		(0.98)	(1.11)	(0.41)	(0.47)	(22.5)	(25.6)	(21.0)	(23.6)	(15.5)	(17.6)	(0.356)	(0.409)
f7f1		2.25 **	2.64 ***	0.21	0.21	5.9	-26.9	32.8 °	18.0	16.7	14.6	-0.087	-0.435
		(0.85)	(0.78)	(0.36)	(0.33)	(19.6)	(18.2)	(18.1)	(16.9)	(13.3)	(12.5)	(0.304)	(0.285)
f8f1		2.74 ***	1.17	0.11	0.30	4.4	-23.2	-18.9	14.4	21.7 °	9.8	0.191	0.229
		(0.70)	(0.72)	(0.30)	(0.31)	(16.6)	(16.6)	(15.2)	(15.4)	(11.3)	(11.3)	(0.256)	(0.257)
f3f2		0.00	0.76	-0.10	-0.46 *	4.5	-21.2 °	-40.9 **	5.6	-6.1	6.0	0.230	-0.048
		(0.67)	(0.51)	(0.28)	(0.21)	(15.4)	(11.8)	(14.3)	(10.9)	(11.2)	(8.4)	(0.254)	(0.196)
f4f2		0.90 °	-0.22	-0.55 **	-0.25	-2.3	1.1	-9.8	10.1	-6.8	-4.4	0.181	0.147
		(0.46)	(0.61)	(0.20)	(0.26)	(10.9)	(14.1)	(10.0)	(13.0)	(7.3)	(9.5)	(0.173)	(0.220)
f5f2		-0.22	0.77	-0.19	-0.16	-30.9 **	1.9	0.7	4.3	-13.8 °	-3.5	0.056	-0.345
		(0.49)	(0.66)	(0.21)	(0.28)	(11.3)	(15.3)	(10.6)	(14.3)	(7.8)	(10.4)	(0.176)	(0.236)
f6f2		-0.30	-0.35	-0.36	0.15	-1.8	26.9	11.0	6.5	-1.8	16.7	-0.326	0.374
		(0.61)	(0.71)	(0.26)	(0.30)	(14.3)	(16.4)	(13.2)	(15.2)	(10.5)	(11.7)	(0.237)	(0.264)
f7f2		-0.67	-0.50	0.01	-0.27	6.1	4.2	-13.8	-22.4	-18.5 *	-11.4	-0.294	-0.235
		(0.57)	(0.67)	(0.24)	(0.28)	(13.1)	(15.3)	(12.2)	(14.2)	(9.3)	(10.5)	(0.212)	(0.237)
f8f2		0.86 °	-1.94 **	-0.13	-0.52 *	-9.4	-3.4	6.8	21.2	-23.1 **	-12.0	-0.014	-0.197
		(0.47)	(0.61)	(0.20)	(0.26)	(10.9)	(14.3)	(10.1)	(13.2)	(7.4)	(9.7)	(0.170)	(0.219)

Table 10: Hierarchical models from the seemingly unrelated regression –Continued 1

	GDP	Remote	Jobless	Remote	Wage	Remote	Income	Remote	Tax	Remote	Population	Remote
f4f3	-0.60	0.05	0.43 *	-0.13	-14.2	-9.6	11.4	-8.1	-2.8	7.8	0.054	-0.237
	(0.51)	(0.60)	(0.22)	(0.26)	(11.7)	(14.1)	(10.8)	(13.0)	(7.9)	(9.6)	(0.178)	(0.217)
f5f3	1.50 **	-0.78	0.04	0.09	-5.4	37.6 **	-6.8	7.4	-9.0	-1.5	0.129	-0.189
	(0.56)	(0.57)	(0.24)	(0.24)	(12.9)	(13.4)	(11.9)	(12.6)	(9.0)	(9.2)	(0.205)	(0.211)
f6f3	-0.88	0.04	-0.01	-0.42	-0.7	-13.0	-33.7 °	5.8	5.0	-0.1	-0.328	-0.208
	(0.82)	(0.76)	(0.35)	(0.32)	(19.1)	(17.7)	(17.7)	(16.6)	(13.5)	(13.6)	(0.306)	(0.308)
f7f3	-0.42	-0.23	0.32	0.68 *	-13.6	-17.5	6.7	24.1	-16.6	8.9	-0.151	-0.167
	(0.86)	(0.78)	(0.36)	(0.33)	(19.7)	(17.9)	(18.2)	(16.5)	(13.3)	(12.0)	(0.300)	(0.272)
f8f3	0.79	0.75	-0.30	0.05	28.0 °	-29.6 °	20.0	17.5	0.9	-3.1	0.035	0.259
	(0.62)	(0.66)	(0.26)	(0.28)	(14.3)	(15.3)	(13.3)	(14.5)	(9.9)	(10.6)	(0.223)	(0.240)
f5f4	-0.49	1.63 **	-0.63 ***	-0.27	-0.1	3.6	0.2	-1.6	5.5	8.2	0.038	0.128
	(0.43)	(0.57)	(0.18)	(0.25)	(10.2)	(13.4)	(9.4)	(12.4)	(6.9)	(9.1)	(0.158)	(0.208)
f6f4	-1.08	2.31 **	0.21	0.45	-60.5 ***	52.3 *	-0.7	-19.2	10.7	-25.6 °	0.076	0.688 *
	(0.70)	(0.89)	(0.30)	(0.38)	(16.2)	(21.2)	(15.3)	(19.8)	(11.3)	(14.8)	(0.257)	(0.338)
f7f4	0.29	1.61 **	-0.03	-0.10	17.6 °	-22.6 °	31.6 **	-14.9	-13.7 °	-7.9	0.173	0.290
	(0.45)	(0.54)	(0.19)	(0.23)	(10.5)	(12.5)	(9.7)	(11.6)	(7.2)	(8.5)	(0.163)	(0.195)
f8f4	-0.06	-0.98 °	0.13	0.01	-14.0	-13.0	-8.3	7.2	-3.6	1.1	-0.070	-0.361 °
	(0.43)	(0.58)	(0.18)	(0.25)	(9.7)	(13.4)	(9.0)	(12.4)	(6.6)	(9.0)	(0.150)	(0.206)
f6f5	-0.30	0.87	0.02	-0.17	-2.8	5.2	7.2	11.2	23.3 *	2.1	-0.150	0.037
	(0.65)	(0.87)	(0.27)	(0.37)	(14.9)	(19.9)	(13.8)	(18.4)	(10.6)	(13.9)	(0.242)	(0.313)
f7f5	-0.45	1.49 °	-0.20	-0.74 *	21.2 °	-5.9	16.8	0.1	-11.8	-33.0 *	-0.164	-0.335
	(0.52)	(0.84)	(0.22)	(0.36)	(12.1)	(19.5)	(11.2)	(18.0)	(8.2)	(13.3)	(0.187)	(0.304)
f8f5	-1.38 *	0.95	-0.06	-0.30	-8.6	-1.5	1.3	2.4	-9.7	-7.5	-0.126	-0.067
	(0.55)	(0.70)	(0.24)	(0.30)	(12.9)	(16.1)	(11.9)	(14.8)	(8.6)	(10.8)	(0.196)	(0.244)
f7f6	-0.32	1.07	-0.08	0.06	-15.9	17.3	35.6 *	-60.3 **	10.3	14.5	-0.030	0.557
	(0.68)	(1.04)	(0.29)	(0.45)	(15.5)	(24.2)	(14.3)	(22.3)	(10.6)	(16.9)	(0.240)	(0.383)
f8f6	0.25	-0.32	-0.16	0.26	-11.0	4.0	25.7 *	-25.6 °	-15.3 °	3.3	0.028	0.064
	(0.57)	(0.63)	(0.24)	(0.27)	(13.0)	(14.6)	(12.0)	(13.5)	(8.8)	(10.0)	(0.200)	(0.226)
f8f7	-1.14 *	1.34 *	-0.33	0.02	8.6	-8.2	26.1 *	9.8	-13.7 °	-3.1	0.076	0.068
	(0.50)	(0.63)	(0.22)	(0.27)	(11.9)	(14.4)	(10.9)	(13.3)	(8.0)	(9.6)	(0.182)	(0.218)
West	4.63 **		-4.63 ***		298.2 ***		69.7 °		11.9		0.062	
	1.61		0.69		40.2		41.1		31.4		0.710	
r2	0.86		0.86		0.94		0.84		0.93		0.79	
p	0.000		0.000		0.000		0.000		0.000		0.000	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The mediation approach allows direct impacts of variables upon each other as well as indirect effects, i.e., effects that are mediated by another additional variable to be tested. The idea of mediation is conceptually a challenge while it is rather easy to implement technically. Mediation models simply consist of a series of regressions with a subsequent inclusion of mediation variables (Hayes, 2012). In the following explanation, we forego the inclusion of the interaction terms and thereby simplify our moderated mediation approach to a simple mediation approach in order to facilitate understanding. Remoteness is therefore treated as if it were an exogenous control variable in the principal explanation. In order to identify the indirect effects of the exogenous variable on the endogenous variable via the *m* mediators, *m+1* models are estimated in an overarching logical model with a hierarchical causal structure. The first model explains the first mediator in terms of the exogenous variables (West and Remote) and the *n* covariates (the industrial factors):

$$GDP = \beta_{10} + \beta_{11} West + \beta_{12} \,\mathrm{Re}\, mote + \sum_{1}^{i} \left[\beta_{1;i+2} Industry_i \right] + e_1 \tag{5}$$

The second model explains the second mediator in terms of the exogenous variables, the covariates and the first mediator:

$$Jobless = \beta_{20} + \beta_{21} West + \beta_{22} \,\mathrm{Re}\, mote + \beta_{23} GDP + \sum_{1}^{i} \left[\beta_{2;i+3} Industry_i \right] + e_2 \tag{6}$$

The third model explains the third mediator in terms of the exogenous variable and the first and second mediator and so on:

$$\begin{aligned} Mediator_m &= \beta_{m0} + \beta_{m1} West + \beta_{m2} \,\mathrm{Re}\, mote \\ &+ \sum_{1}^{m-1} \beta_{m;n+2} Mediator_n + \sum_{1}^{i} \left[\beta_{m;i+m+2} Industry_i \right] + e_m \end{aligned} \tag{7}$$

$\beta_{m;n+2}$ determines the direct effects of the mediators and $\beta_{m;i+m}$ determines the direct effects of the covariates upon the mediator on the left hand side of Equation (7). The indirect effects of the covariates upon the different endogenous variables via selected mediators is calculated by the multiplication

- of the estimated effect of the covariate of interest upon the first mediator of interest
- with sthe estimated effect of this first mediator upon the following mediators of interest in the causal chain
- with the estimated effect of the last mediators of interest in the causal chain upon the endogenous variable under interest.

A summation of all direct and indirect effects gives the total effect of a covariate upon any of the endogenous variables. The total effect could also be estimated as

$$SocioEconomic_n = \beta_{n0} + \beta_{n1} West + \beta_{n2}\,\mathrm{Re}\,mote + \sum_{1}^{i}\left[\beta_{n;i+3} Industry_i\right] + e_n . \quad (8)$$

The total effect may be insignificant despite significant direct and indirect effects if the signs of single effects are oppositional. The assessment of the significance of indirect effects necessitates some further calculations. As we not only deal with mediation but simultaneously introduce moderator variables, i.e., multiplicative interactions among explanatory variables, matters become further complicated (see Figure 1). The different regressions to be estimated in this case have the following structure with interaction effects:

$$\begin{aligned} Mediator_m &= \beta_{m0} + \beta_{m1} West + \beta_{m2}\,\mathrm{Re}\,mote \\ &+ \sum_{1}^{m-1} \beta_{m;n+2} Mediator_n + \sum_{1}^{i}\left[\beta_{m;i+m+2} Industry_i\right] + \sum_{1}^{i}\sum_{1}^{j}\left[\beta_{m;2(i+m)+2} Industry_i Industry_j\right] \\ &+ \sum_{1}^{m-1} \beta_{m;3(i+m)+2} Mediator_n\,\mathrm{Re}\,mote + \sum_{1}^{i}\left[\beta_{m;4(i+m)+2} Industry_i\,\mathrm{Re}\,mote\right] \\ &+ \sum_{1}^{i}\sum_{1}^{j}\left[\beta_{m;5(i+m)+2} Industry_i Industry_j\,\mathrm{Re}\,mote\right] + e_m \end{aligned} \quad (9)$$

This implies that we expect to find a relation between the prevalence of specific industries and different indicators of a district's socio-economic situation. This relation is assumed to be conditional upon, or moderated by, the prevalence of a second important industry as indicated by the interaction between industrial factor i and industrial factor j. This moderated effect is assumed to be partially mediated by the relation between industrial structure and other socio-economic indicators. This mediation is accounted for by the sequential regression of hierarchical models that build upon each other by the sequential introduction of mediating variables. The mediated effect is calculated by the subsequent multiplication of coefficients as explained above. Nevertheless, in order to complicate matters further, Equation (8) shows that the direct industry effect as well as the mediated industry effect are assumed to be conditional upon, or moderated by, the remoteness factor. This is indicated again by the three last interaction terms in Equation (8). Thereby the direct relationship of the prevalence of a specific industry type, as well as its indirect relationship to one of the socio-economic dimensions via other socio-economic dimensions, is allowed to differ, depending on district's remoteness.

Nevertheless, even in this case, the calculation of conditional indirect effects via the product of coefficients method (Preacher et al., 2007) as described above is rather unproblematic. More problematic is the calculation of corrected standard errors. Preacher et al., propose a bootstrapping approach to the calculation of standard errors and confidence intervals. This is the preferred method as the alternative normal theory based approach's assumptions concerning the normal distribution of effects does often not apply for conditional indirect effects, i.e., for moderated mediated effects.[1] Despite this problem, the analysis in this paper relies on the

[1] For an assessment of different tests of the significance of mediated effects refer also to MacKinnon et al. (2002).

normal theory based approach, which has also been described by Preacher et al. (2007). The reason for this choice is simple: Due to the various mediators, moderators and the large number of relevant covariates, the bootstrapping approach is too computationally intensive to be practicable for us. We implement the normal theory based approach as described by Preacher et al. (2007) in STATA.[2] The "nlcom" (non-linear combination) command we use in STATA in order to calculate mediated effects and their standard errors from the original separate regressions computes the standard errors using the delta method, which assumes that the estimates of the indirect effect are normally distributed (UCLA, 2013).

The results show the kind of relationship between industries and socio-economic fundamentals, they help to distinguish between direct and indirect (mediated) effects and they allow one to assess whether or not relationships are significant in central, medium and remote locations. The resulting moderated and mediated effects for different combinations in the levels of the mediating and moderating variables with their point-specific significances are discussed in the following chapter.

[2] There is a very good description of the possibility to implement moderated mediation in STATA on http://www.ats.ucla.edu/stat/stata/faq/modmed.htm [Last access 04/03/2013]. The most flexible and easily accessible approach in technical terms is via a combination of the sureg command and the nlcom command in STATA.

4 Results: The industrial structure perspective

In the interpretation of the results, the fundamental difference between conditions in agglomerated and sparse economic regions need to be taken into account. Specifically, in agglomerated regions, the relative concentration of one industry is usually in addition to many other economic activities - an advantage that has been described with the term of "urbanisation effects". In regions with sparse economic activity, on the other hand, a relatively strong prevalence of specific industries usually comes at the expense of other economic activities. A relative dominance of health services, for example, might be favourable for the level of GDP in agglomerated regions due to its relatively high productivity per employee. But in peripheral regions, a high relative share of health services indicates a relatively low relevance of other industries. Here, the relation to GDP per inhabitant might be rather negative as health service is not a solid basis for a regional economy in itself and its prevalence indicates the lack of economic alternatives. Moreover, industries' productivity might differ between agglomerated and sparse regions not only due to positive agglomeration effects but also because the character of the industries themselves might differ between regions. Professional services might consist of more demanding high quality activities in regions with a large number and variety of suppliers of such services due to, for example, specialisation effects. In summary, productivity of industries might differ between agglomerated and sparse regions due to localisation effects, urbanisation effects and uneven spatial distribution of different activities within industries.

In the following, the documented effects are differentiated by remoteness (central, medium and remote location) and by the prevalence of the other industrial factors. The documented significances were calculated separately for each single effect (see Chapter 3.2). Not all relations are discussed for each industrial factor. The complete results are documented in the appendix. In the following chapters, only the most significant relationships with the most complete stories are documented and discussed.

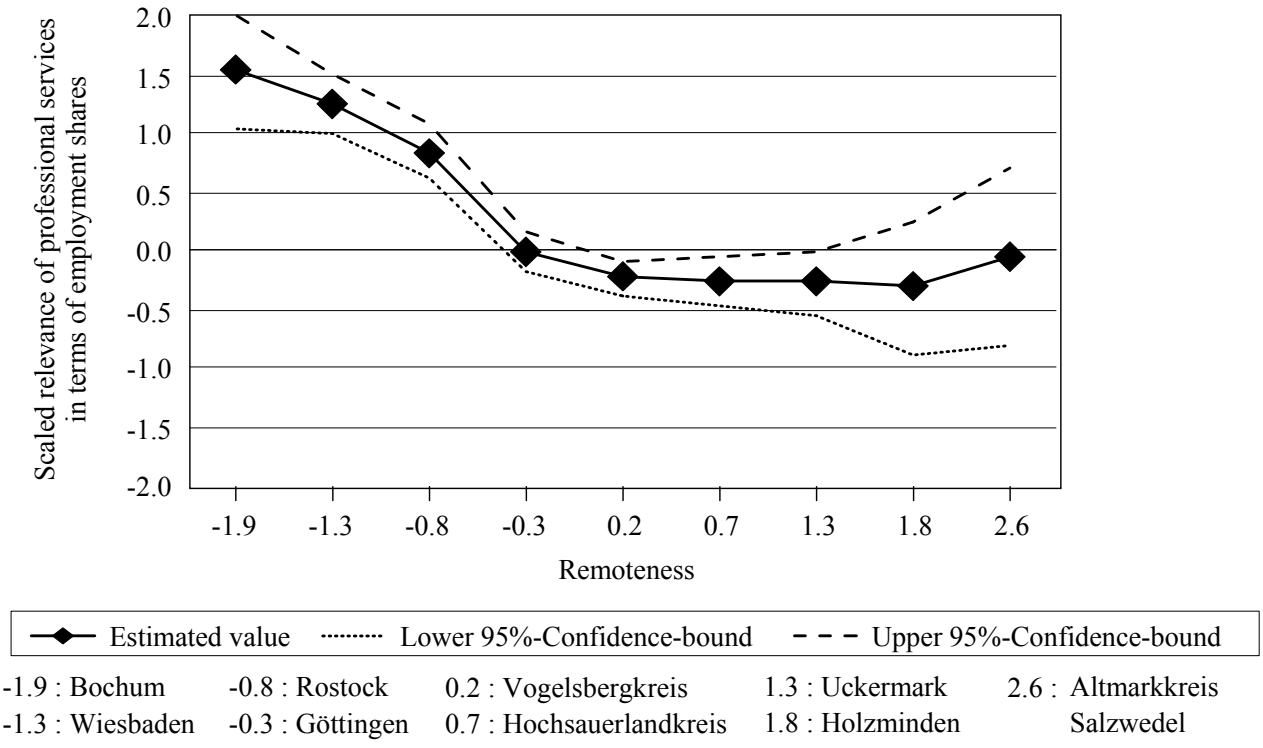
For each industrial factor, its relation to the districts' remoteness is represented descriptively in two ways: first, in terms of an "industrial" response curve and second by the comparative representation of the geographical distribution of the industrial factor and of the remoteness factor in two neighbouring maps. Response curves allow for the determination of a non-linear relationship between an environmental characteristic and the distribution of species, substances and other (ecologically) relevant elements of interest. For the creation of industry response curves the non-linear relation between the eight industrial factors and the remoteness factor is estimated. In preparation of the estimation, nine equidistant classes were constructed from the remoteness factor and the factor was transformed into eight corresponding categorical dummy variables. In the OLS-regression without intercept, the industrial factor under scrutiny is explained by the eight dummies for remoteness. The west-east dummy is included as a control. The industry response curve is a graphical representation of the relation between the sorted remoteness dummies and the value of the industrial factor as expressed by the estimated coefficients. The significance of the estimates is indicated graphically by the upper and lower 95-

percent confidence bounds. In order to support intuition, an exemplary district has been attributes to each remoteness-class. Bochum, which is a city from the densely populated, industrial, and heavily urbanised German Ruhr area, has been selected to illustrate the most central class around the remoteness factor value "-1.9". The Altmarkkreis Salzwedel in contrast is sparsely populated, far away from urban centers and characterised by a relatively high share of primary production. It has been selected to illustrate the most remote districts in the factor's class around value "2.6". These and all other explicitly named districts in the figures serve solely illustrative purposes.

4.1 Professional services

Professional services have a relatively high share of all employees in central regions (Figure 2).

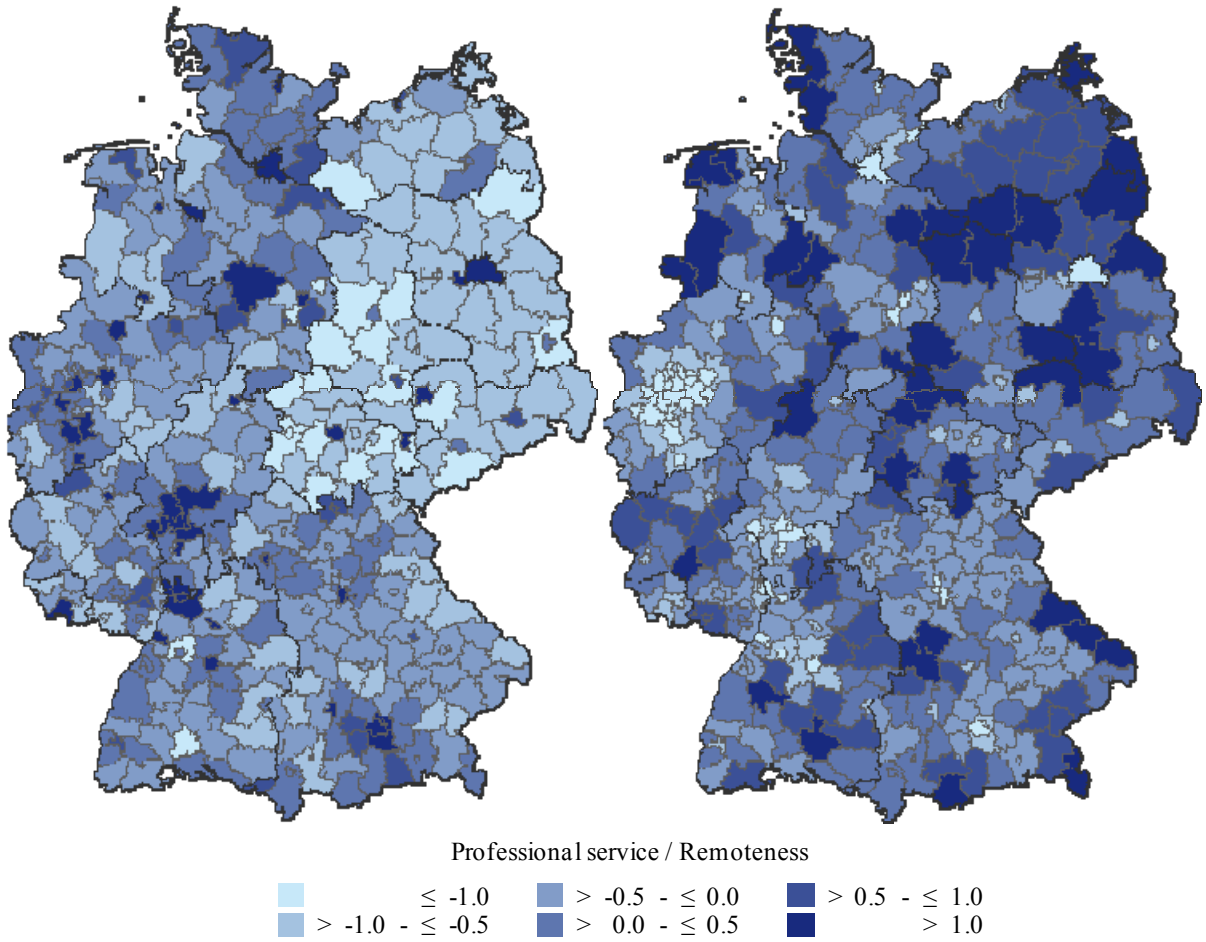
Figure 2: Industry response curve for professional service with respect to remoteness



Source: Own figure.

Map 8 offers a more differentiated and geographically explicit impression of the distribution of professional services in space. Obviously, professional services are more concentrated in central regions, but there are peripheral regions with a relatively high prevalence of professional services as well.

Map 8: Geographical distribution of industrial factor "Professional Services" (NUTS 3) (left) as compared to districts' remoteness (right)



Source: Own maps; basis for the map: GfK GeoMarketing (2010).

Table 11 shows that there is usually a positive relation between a relatively high prevalence of professional services and GDP per inhabitant, i.e., a region's productivity. This general effect seems not to be conditional on districts' remoteness. Nevertheless, the effect clearly depends on [is moderated by] accompanying industries and this moderation *is* conditional on the districts' remoteness. For example, professional services are positively related to GDP per inhabitant in *central* regions with a low share of employees in simple production activities, but there is no significant relation in *remote* regions with a low share of employees in simple production activities. This observation hints at a lack of positive urbanisation and localisation effects for professional services to become effective in these remote regions. Due to the lack of general agglomeration effects, synergies to specific other industries become relevant in remote areas. Professional services are therefore extremely positively related to regional productivity in remote areas, if they are accompanied by a high share of employees in knowledge-intensive production. In central regions, a relative specialisation in professional services, i.e., localisation effects, seem to be favourable for central regions' productivity as the positive relation to GDP per inhabitant is usually significant here if the relevance of other activities is low.

Wages are positively related to a high prevalence of professional service activities in central regions and negatively in remote regions. This supports the assumption that there is a differentiation of professional service activities between the two types of regions. This differentiation might be due to a lack of specialisation in professional activities in remote regions' sparse markets, or it might be due to a lack of demand for specifically well paid professional services in remote regions due to a lack of complementary industries or due to the lack of general agglomeration effects. The observation that there is no positive relation between wages and professional service activities independent of the accompanying industries supports the notion of a lack of specialisation in the most profitable activities due to missing urbanisation effects. In conclusion, there seems to be a fundamental heterogeneity in professional service character between central and peripheral regions.

Table 11: Direct relations between factor "Professional services" and GDP, respectively wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Professional service					
		GDP direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		2.356 (1.688)	1.846 ** (0.657)	1.337 (1.597)	174.993 *** (38.871)	37.553 * (15.220)	-99.887 ** (37.075)
Simple production	low	4.948 *** (1.428)	2.521 ** (0.915)	0.094 (1.997)	180.999 *** (34.512)	-18.749 (21.083)	-218.496 *** (46.109)
	high	-0.236 (2.444)	1.171 (0.904)	2.579 (2.406)	168.986 ** (55.569)	93.854 *** (20.798)	18.723 (55.337)
Primary and related production	low	5.628 *** (1.260)	2.904 *** (0.787)	0.181 (2.080)	120.755 *** (31.606)	20.619 (18.317)	-79.516 (48.949)
	high	-0.916 (2.319)	0.788 (1.071)	2.493 (2.037)	229.230 *** (52.815)	54.486 * (24.460)	-120.257 ** (46.538)
Large scale production	low	0.296 (1.736)	2.121 * (0.897)	3.945 ° (2.285)	172.100 *** (39.918)	47.662 * (21.223)	-76.776 (54.174)
	high	4.416 * (1.979)	1.572 (1.030)	-1.272 (2.260)	177.885 *** (45.765)	27.444 (24.017)	-122.997 * (51.851)
Trade services and food	low	1.404 (1.863)	2.375 ** (0.900)	3.347 ° (2.000)	162.039 *** (42.780)	45.217 * (20.922)	-71.605 (46.221)
	high	3.307 (2.040)	1.317 (0.878)	-0.673 (2.143)	187.946 *** (46.957)	29.889 (20.038)	-128.169 ** (49.419)
Recreation service	low	2.684 (1.799)	2.495 * (1.060)	2.306 (2.517)	148.908 *** (41.077)	19.631 (24.339)	-109.646 ° (57.382)
	high	2.028 (2.894)	1.198 (1.088)	0.367 (2.496)	201.077 ** (66.511)	55.475 * (24.862)	-90.128 (57.940)
Knowledge intensive production	low	4.536 * (1.891)	-0.145 (0.985)	-4.826 * (2.283)	131.770 ** (43.983)	31.478 (22.447)	-68.814 (53.312)
	high	0.176 (1.739)	3.838 *** (0.936)	7.499 ** (2.366)	218.215 *** (39.767)	43.628 * (21.933)	-130.960 * (54.749)
Health service	low	1.319 (1.811)	-0.585 (0.830)	-2.490 (2.028)	132.267 ** (41.804)	30.143 (18.919)	-71.980 (47.100)
	high	3.393 ° (1.881)	4.278 *** (0.906)	5.163 * (2.241)	217.718 *** (43.258)	44.963 * (21.411)	-127.793 * (51.693)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

A high prevalence of professional services does not have significant direct employment effects (see Appendix). Nevertheless, since a high GDP per inhabitant is positively related to employment, professional services indirectly contribute to lower unemployment via a higher regional productivity (Table 12). Moreover, possibly due to a relatively high share of self employment and small firms in professional services, there is a positive direct relation to household income in medium and remote regions. This positive relation in remote regions again depends on the accompanying prevalence of specific other industries.

Table 12: Direct and indirect relations between factor "Professional services" and joblessness, respectively household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Professional service					
		Joblessness via GDP			Household income direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.253 (0.209)	-0.232 * (0.094)	-0.193 (0.246)	36.544 (39.453)	48.548 *** (14.208)	60.553 ° (36.170)
Simple production	low	-0.531 * (0.267)	-0.317 * (0.131)	-0.014 (0.288)	40.994 (35.473)	20.996 (19.447)	0.998 (44.959)
	high	0.025 (0.262)	-0.147 (0.117)	-0.372 (0.385)	32.094 (54.039)	76.101 *** (19.751)	120.108 * (52.170)
Primary and related production	low	-0.604 * (0.283)	-0.365 ** (0.122)	-0.026 (0.300)	27.301 (30.262)	18.150 (16.885)	8.998 (45.797)
	high	0.098 (0.252)	-0.099 (0.136)	-0.359 (0.335)	45.787 (54.739)	78.947 *** (23.000)	112.108 * (45.589)
Large scale production	low	-0.032 (0.187)	-0.267 * (0.124)	-0.569 (0.417)	53.467 (40.505)	62.635 ** (19.646)	71.803 (52.105)
	high	-0.474 (0.288)	-0.198 (0.135)	0.183 (0.336)	19.621 (45.122)	34.462 (22.360)	49.303 (48.597)
Trade services and food	low	-0.151 (0.209)	-0.299 * (0.128)	-0.482 (0.361)	8.569 (42.723)	54.626 ** (19.433)	100.682 * (44.120)
	high	-0.355 (0.263)	-0.166 (0.115)	0.097 (0.312)	64.518 (46.317)	42.471 * (18.552)	20.424 (47.120)
Recreation service	low	-0.288 (0.227)	-0.314 * (0.147)	-0.332 (0.392)	92.157 * (40.939)	66.214 ** (22.434)	40.271 (55.576)
	high	-0.218 (0.323)	-0.151 (0.140)	-0.053 (0.361)	-19.069 (63.653)	30.883 (23.474)	80.835 (53.733)
Knowledge intensive production	low	-0.487 ° (0.285)	0.018 (0.124)	0.696 (0.455)	37.138 (42.784)	18.116 (20.785)	-0.907 (49.869)
	high	-0.019 (0.187)	-0.483 ** (0.151)	-1.081 ° (0.595)	35.949 (41.434)	78.981 *** (20.322)	122.013 * (52.529)
Health service	low	-0.142 (0.203)	0.074 (0.105)	0.359 (0.334)	70.518 ° (41.128)	63.602 *** (17.555)	56.685 (44.457)
	high	-0.364 (0.251)	-0.538 *** (0.155)	-0.744 (0.466)	2.569 (44.019)	33.495 ° (19.858)	64.421 (49.593)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

A direct positive relation of professional services to taxes exists for regions in central and average locations (Table 13). As for wages, this relation is rather negative in peripheral regions. In addition to the direct relation, the higher wages in central and average regions with many professional services contribute positively to regional tax revenues.

Table 13: Direct and indirect relations between factor "Professional services" and tax conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Professional service					
		Tax direct			Tax via wages		
		Central	Medium	Remote	Central	Medium	Remote
None		85.650 ** (28.804)	30.211 ** (10.509)	-25.227 (27.059)	36.760 * (14.319)	6.469 * (2.963)	-13.432 (10.163)
Simple production	low	105.366 *** (25.860)	2.536 (14.073)	-100.294 ** (32.713)	38.021 ** (14.163)	-3.230 (3.697)	-29.381 (20.340)
	high	65.934 ° (39.343)	57.887 *** (14.728)	49.840 (39.092)	35.498 * (16.288)	16.168 ** (4.972)	2.518 (7.624)
Primary and related production	low	52.542 * (22.153)	15.443 (12.316)	-21.656 (33.734)	25.366 * (10.486)	3.552 (3.245)	-10.692 (9.645)
	high	118.758 ** (39.828)	44.980 ** (16.911)	-28.799 (33.870)	48.153 * (18.987)	9.386 * (4.665)	-16.171 (12.363)
Large scale production	low	77.254 ** (29.737)	53.354 *** (14.529)	29.454 (38.801)	36.152 * (14.288)	8.211 * (4.054)	-10.324 (9.970)
	high	94.047 ** (32.737)	7.069 (16.213)	-79.908 * (35.408)	37.367 * (15.343)	4.728 (4.258)	-16.539 (12.944)
Trade services and food	low	97.026 ** (30.882)	32.592 * (14.295)	-31.841 (32.447)	34.039 * (14.121)	7.789 * (3.969)	-9.629 (8.885)
	high	74.275 * (34.207)	27.831 * (13.524)	-18.614 (35.097)	39.481 * (16.028)	5.149 (3.622)	-17.235 (13.164)
Recreation service	low	12.307 (30.195)	-6.897 (16.486)	-26.100 (41.067)	31.280 * (13.215)	3.382 (4.254)	-14.744 (12.411)
	high	158.993 *** (46.071)	67.320 *** (17.019)	-24.354 (39.222)	42.239 * (19.439)	9.556 * (4.743)	-12.119 (11.160)
Knowledge intensive production	low	92.966 ** (31.056)	14.726 (15.027)	-63.513 ° (36.112)	27.680 * (12.799)	5.423 (4.036)	-9.253 (9.414)
	high	78.335 * (30.401)	45.697 ** (15.229)	13.059 (39.695)	45.839 ** (16.880)	7.516 ° (4.104)	-17.610 (13.748)
Health service	low	81.019 ** (30.288)	10.707 (12.903)	-59.605 ° (32.668)	27.784 * (12.496)	5.193 (3.442)	-9.679 (8.991)
	high	90.282 ** (31.905)	49.716 *** (14.616)	9.150 (36.720)	45.735 ** (17.226)	7.746 ° (4.041)	-17.184 (13.293)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The same positive indirect relation is caused by higher GDP and higher household incomes in regions of average location (Table 14). These indirect positive effects on tax revenues underline the importance of professional services for the prosperity of some agglomerated regions. The

lack of urbanisation effects and the resulting lack of the specialisation of professional services in the most productive activities explain some of the difficulties of remote areas in realising convergence.

Table 14: Indirect relations between factor "Professional services" and tax conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Professional service					
		Tax via GDP			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote
None		18.611 (14.027)	15.430 ** (5.854)	11.782 (14.605)	7.980 (9.099)	6.915 * (2.801)	4.026 (6.760)
Simple production	low	39.088 ** (14.535)	21.071 ** (8.132)	0.832 (17.609)	8.952 (8.414)	2.991 (2.894)	0.066 (2.991)
	high	-1.867 (19.310)	9.789 (7.661)	22.733 (22.506)	7.008 (12.078)	10.839 ** (4.138)	7.986 (13.003)
Primary and related production	low	44.459 ** (14.418)	24.273 *** (7.309)	1.592 (18.346)	5.962 (6.961)	2.585 (2.512)	0.598 (3.187)
	high	-7.237 (18.399)	6.587 (8.992)	21.973 (19.378)	9.999 (12.504)	11.245 * (4.543)	7.454 (12.083)
Large scale production	low	2.338 (13.724)	17.722 * (7.846)	34.778 (23.200)	11.676 (9.828)	8.921 * (3.751)	4.774 (8.254)
	high	34.884 * (17.648)	13.138 (8.778)	-11.213 (20.265)	4.285 (9.978)	4.909 (3.469)	3.278 (6.075)
Trade services and food	low	11.094 (14.943)	19.853 * (7.959)	29.501 (20.157)	1.871 (9.355)	7.780 * (3.522)	6.695 (10.907)
	high	26.127 (17.241)	11.007 (7.478)	-5.936 (18.997)	14.089 (11.359)	6.049 ° (3.139)	1.358 (3.789)
Recreation service	low	21.203 (15.056)	20.852 * (9.270)	20.328 (23.183)	20.125 ° (11.595)	9.431 * (4.145)	2.678 (5.596)
	high	16.019 (23.169)	10.008 (9.186)	3.237 (22.032)	-4.164 (13.984)	4.399 (3.563)	5.375 (9.159)
Knowledge intensive production	low	35.830 * (17.142)	-1.214 (8.233)	-42.545 ° (24.568)	8.110 (9.805)	2.580 (3.047)	-0.060 (3.317)
	high	1.392 (13.744)	32.074 *** (8.880)	66.110 * (30.239)	7.850 (9.495)	11.250 ** (4.278)	8.113 (13.201)
Health service	low	10.417 (14.515)	-4.893 (6.966)	-21.948 (19.295)	15.399 (10.611)	9.059 * (3.562)	3.769 (6.612)
	high	26.804 ° (16.136)	35.753 *** (8.904)	45.512 ° (24.849)	0.561 (9.615)	4.771 (3.128)	4.284 (7.487)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

There is a direct positive relation between the existence of many professional service activities in regions of average location and the development of the population (Table 15). The indirect effect on population development via regional tax revenues is more difficult to understand. Relatively higher tax revenues have a positive relation with population development in peripheral regions. Their negative relation to population development in central regions must be understood under

the heading of costs of living. Costs of living are generally high in central regions with high tax revenues per inhabitant. Accordingly, the higher tax revenues in central regions with more professional services relate negatively to population development, and so do the lower tax revenues in peripheral regions with more professional services.

Table 15: Direct and indirect relations between factor "Professional services" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Professional service					
		Population development direct			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote
None		0.497 (0.656)	0.668 ** (0.239)	0.839 (0.610)	-0.721 * (0.328)	0.004 (0.037)	-0.220 (0.250)
Simple production	low	1.070 ° (0.597)	0.968 ** (0.318)	0.866 (0.745)	-0.887 * (0.349)	0.000 (0.004)	-0.874 * (0.437)
	high	-0.076 (0.896)	0.368 (0.340)	0.812 (0.882)	-0.555 (0.373)	0.008 (0.072)	0.434 (0.378)
Primary and related production	low	-0.221 (0.503)	0.420 (0.278)	1.061 (0.760)	-0.442 ° (0.231)	0.002 (0.019)	-0.189 (0.303)
	high	1.214 (0.910)	0.916 * (0.384)	0.617 (0.764)	-1.000 * (0.454)	0.007 (0.056)	-0.251 (0.310)
Large scale production	low	0.108 (0.680)	0.506 (0.333)	0.904 (0.879)	-0.651 * (0.320)	0.008 (0.066)	0.257 (0.352)
	high	0.885 (0.745)	0.830 * (0.365)	0.775 (0.805)	-0.792 * (0.367)	0.001 (0.009)	-0.696 ° (0.406)
Trade services and food	low	0.437 (0.705)	0.545 ° (0.324)	0.652 (0.731)	-0.817 * (0.361)	0.005 (0.040)	-0.277 (0.302)
	high	0.557 (0.775)	0.791 ** (0.306)	1.026 (0.790)	-0.625 ° (0.346)	0.004 (0.034)	-0.162 (0.312)
Recreation service	low	0.611 (0.693)	1.106 ** (0.371)	1.601 ° (0.940)	-0.104 (0.256)	-0.001 (0.009)	-0.227 (0.368)
	high	0.383 (1.056)	0.230 (0.392)	0.077 (0.893)	-1.339 * (0.565)	0.010 (0.083)	-0.212 (0.351)
Knowledge intensive production	low	-0.101 (0.707)	0.748 * (0.340)	1.598 ° (0.819)	-0.783 * (0.355)	0.002 (0.018)	-0.553 (0.378)
	high	1.095 (0.692)	0.588 ° (0.348)	0.080 (0.899)	-0.660 * (0.326)	0.007 (0.057)	0.114 (0.349)
Health service	low	0.670 (0.688)	0.496 ° (0.291)	0.322 (0.739)	-0.682 * (0.330)	0.002 (0.013)	-0.519 (0.346)
	high	0.324 (0.727)	0.840 * (0.334)	1.357 (0.828)	-0.760 * (0.356)	0.007 (0.062)	0.080 (0.321)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

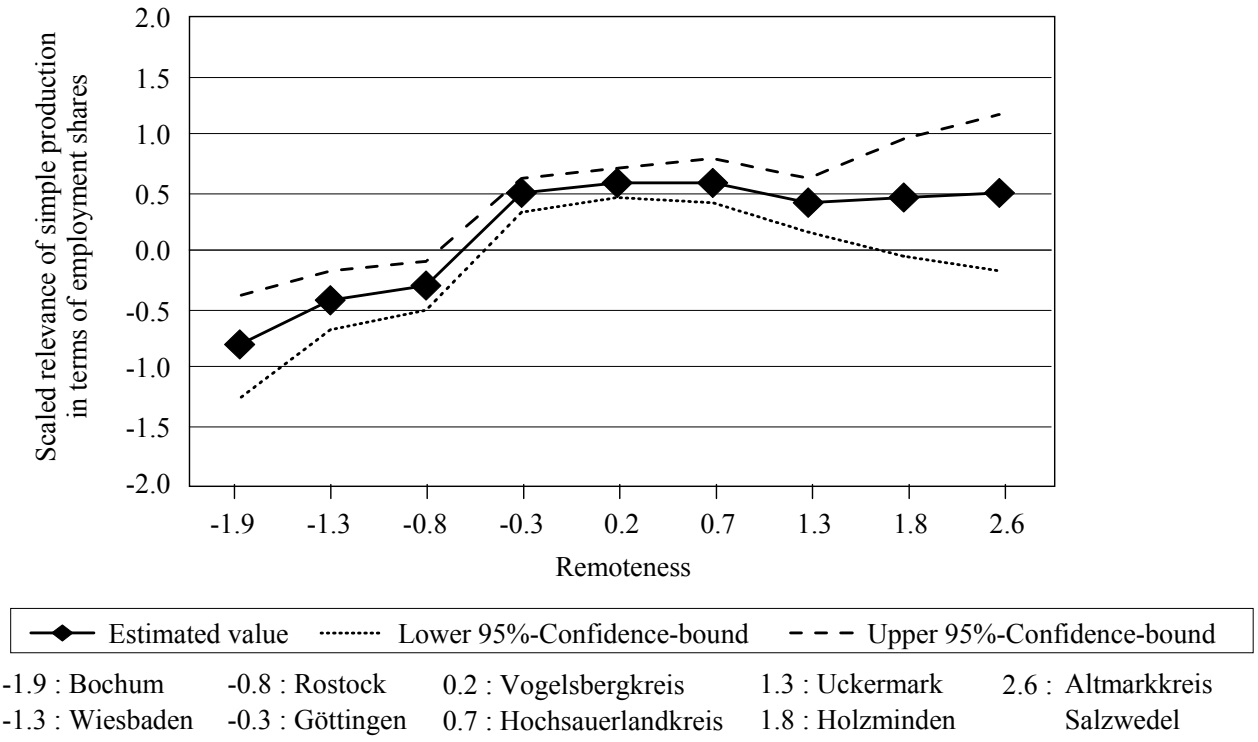
In summary, professional services can be important factors for the economy of regions in central and average locations. They also contribute positively to the regional economy of remote regions, if the latter are characterised by an above average share of industries related to

knowledge-intensive production. Otherwise, the productivity of professional services in peripheral regions is rather low, due to lacking agglomeration and specialisation effects.

4.2 Simple production

"Simple production" activities have a relatively high share in all employees in regions in average and remote locations (Figure 3). They have a low share in central regions.

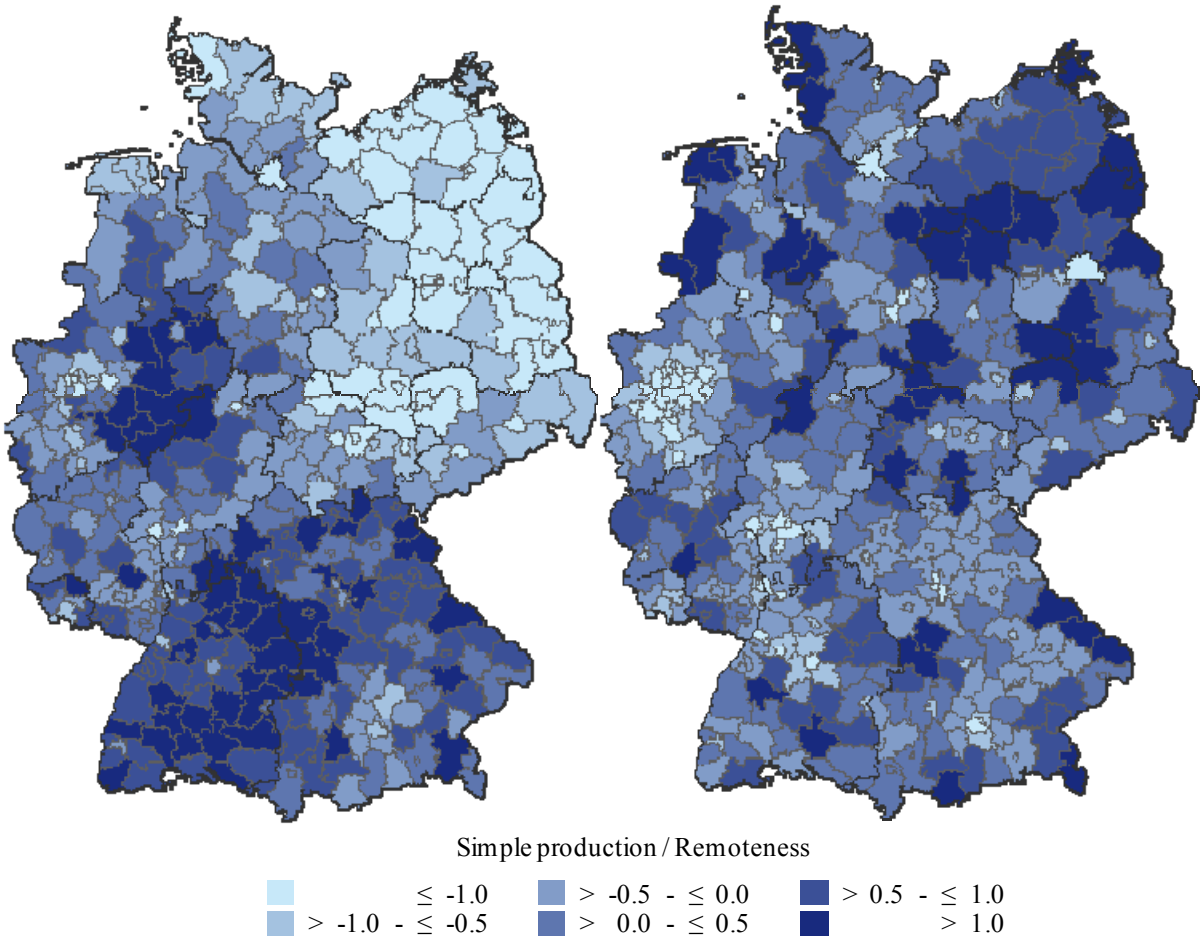
Figure 3: Industry response curve for "Simple Production" with respect to remoteness



Source: Own figure based on own calculations

The map offers a more differentiated and geographically explicit impression of the distribution of "Simple Production" in space. The lack of a clear cut relationship between centrality and the prevalence of simple production activities becomes evident. There are concentrations of activities in simple production in regions of medium remoteness in North Rhine-Westphalia, Baden-Württemberg and Bavaria.

Map 9: Geographical distribution of industrial factor "Simple Production" (left) as compared to remoteness (right) (NUTS 3)



Source: Own maps; basis for the map: GfK GeoMarketing (2010).

There is no specifically significant relation between activities of simple production and regional GDP per inhabitant (see appendix). This ambiguity implies that the internal heterogeneity of activities related to simple production is high. Nevertheless, the relation to joblessness is unambiguously negative, irrespective of the remaining industry mix or location (Table 16). This is understandable if one recalls that a high share of unqualified employees is a factor that contributes positively to the factor "Simple production".

At the same time, the relationship between a relative concentration in simple production and the wage level is significantly positive in most regions in average and peripheral locations. The negative relation between simple production and wages for central regions is not significant. Nevertheless, the comparison shows that simple production does not seem to profit from agglomeration effects to the same degree as other activities. This also explains the relatively low prevalence of simple production activities in central regions (see Figure 3). Interestingly, in remote regions, the positive relation to wages is especially pronounced if professional services are relatively important as well. Accordingly, professional services might not only be

complementary to knowledge-intensive production but also to specific activities in simple production. Also interesting is the observation that a low joblessness is characteristic for regions with simple production and a low level of professional activities, while high wages are found in regions with simple production and a high level of professional services. Obviously there is a trade-off in remote regions' sparse markets between job market participation and a concentration of more qualified and well-paid jobs.

Table 16: Direct relations between factor "Simple production" and unemployment and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Simple production					
		Joblessness direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-2.480 *** (0.485)	-2.115 *** (0.222)	-1.750 *** (0.477)	-14.228 (33.778)	34.115 * (13.475)	82.459 ** (31.031)
Professional service	low	-2.235 ** (0.678)	-2.262 *** (0.299)	-2.290 *** (0.683)	-8.194 (42.184)	-22.451 (17.323)	-36.707 (41.485)
	high	-2.725 *** (0.670)	-1.967 *** (0.391)	-1.210 (0.914)	-20.262 (42.088)	90.681 *** (21.925)	201.624 *** (51.642)
Primary and related production	low	-3.290 *** (0.544)	-2.111 *** (0.286)	-0.932 (0.667)	-34.489 (34.637)	39.182 * (16.505)	112.854 ** (38.906)
	high	-1.670 * (0.759)	-2.119 *** (0.384)	-2.568 *** (0.513)	6.033 (47.888)	29.048 (21.714)	52.064 (34.077)
Large scale production	low	-2.342 *** (0.586)	-1.603 *** (0.269)	-0.864 (0.617)	-12.188 (37.776)	36.814 * (15.425)	85.815 * (36.179)
	high	-2.618 *** (0.615)	-2.627 *** (0.288)	-2.636 *** (0.701)	-16.268 (39.818)	31.417 ° (17.192)	79.102 ° (43.015)
Trade services and food	low	-2.507 *** (0.576)	-1.913 *** (0.291)	-1.319 * (0.552)	12.559 (36.943)	58.854 *** (16.748)	105.149 ** (32.934)
	high	-2.453 *** (0.730)	-2.317 *** (0.273)	-2.181 ** (0.695)	-41.015 (45.436)	9.377 (16.092)	59.768 (42.733)
Recreation service	low	-1.964 ** (0.636)	-1.794 *** (0.314)	-1.624 ** (0.594)	43.530 (40.546)	40.564 * (17.740)	37.598 (36.499)
	high	-2.996 *** (0.882)	-2.436 *** (0.344)	-1.876 ** (0.675)	-71.987 (52.054)	27.666 (19.791)	127.319 ** (40.245)
Knowledge intensive production	low	-3.015 *** (0.620)	-2.178 *** (0.308)	-1.342 * (0.677)	-4.358 (40.424)	33.621 ° (17.715)	71.601 ° (40.902)
	high	-1.945 ** (0.672)	-2.052 *** (0.303)	-2.159 ** (0.662)	-24.098 (41.396)	34.609 * (17.447)	93.316 * (39.210)
Health service	low	-3.135 *** (0.625)	-1.994 *** (0.276)	-0.853 (0.623)	-13.435 (41.078)	41.769 ** (16.131)	96.973 ** (37.327)
	high	-1.825 ** (0.606)	-2.236 *** (0.272)	-2.647 *** (0.617)	-15.021 (37.918)	26.461 ° (15.962)	67.944 ° (38.096)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

There is also a strong direct positive relation between simple production activity and household income especially for peripheral regions (Table 17). This direct effect, which is not transmitted via joblessness and wages, might be explained, for example, by greater labour market participation of women and younger household members. In central and medium regions, an indirect positive relation among household income and simple production is created via the relatively low unemployment in regions with simple production activities.

Table 17: Direct and indirect relations between factor "Simple production" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Simple production					
		Household income direct			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		0.737 (32.040)	49.080 *** (12.496)	80.513 ** (29.043)	54.041 ** (16.968)	26.639 *** (6.158)	5.948 (8.949)
Professional service	low	6.771 (40.139)	21.398 (15.968)	20.679 (38.327)	48.705 * (19.009)	28.497 *** (6.970)	7.783 (11.747)
	high	-5.298 (41.363)	76.762 *** (20.624)	140.348 ** (48.626)	59.378 ** (20.628)	24.781 *** (7.093)	4.113 (6.833)
Primary and related production	low	-19.525 (35.569)	95.871 *** (15.343)	111.120 ** (36.525)	71.687 *** (21.224)	26.585 *** (6.552)	3.167 (5.205)
	high	20.998 (44.710)	2.289 (20.052)	49.907 (31.522)	36.395 ° (18.805)	26.693 *** (7.321)	8.730 (13.033)
Large scale production	low	2.777 (35.667)	59.178 *** (14.304)	77.087 * (33.584)	51.036 ** (17.901)	20.188 *** (5.364)	2.936 (4.823)
	high	-1.304 (38.879)	38.982 * (15.890)	83.940 * (40.084)	57.047 ** (19.389)	33.090 *** (7.719)	8.961 (13.471)
Trade services and food	low	27.524 (35.524)	46.014 ** (15.669)	72.245 * (31.366)	54.627 ** (18.370)	24.096 *** (6.166)	4.484 (6.895)
	high	-26.050 (44.028)	52.146 *** (14.818)	88.782 * (39.406)	53.456 ** (20.629)	29.183 *** (6.921)	7.412 (11.218)
Recreation service	low	58.495 (40.719)	39.328 * (16.505)	58.314 ° (33.621)	42.795 * (17.401)	22.598 *** (6.104)	5.521 (8.415)
	high	-57.022 (49.666)	58.832 ** (18.316)	102.713 ** (38.050)	65.287 ** (25.032)	30.680 *** (7.658)	6.375 (9.708)
Knowledge intensive production	low	10.606 (39.627)	66.900 *** (16.390)	128.519 *** (38.340)	65.703 ** (21.051)	27.437 *** (6.850)	4.560 (7.128)
	high	-9.133 (39.353)	31.259 ° (16.150)	32.508 (36.335)	42.379 * (17.961)	25.842 *** (6.551)	7.337 (11.086)
Health service	low	1.530 (39.121)	42.171 ** (14.984)	42.781 (34.996)	68.310 ** (21.602)	25.112 *** (6.231)	2.899 (4.782)
	high	-0.057 (36.957)	55.989 *** (14.749)	118.246 *** (35.260)	39.773 * (16.425)	28.166 *** (6.737)	8.998 (13.477)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Similarly, the relatively lower unemployment in regions with many simple production activities causes higher tax revenues (Table 18). Other than with household income though, this effect is most relevant in average and remote regions. To a lesser degree, higher household incomes due to simple production activities also contribute positively to local tax revenues.

Table 18: Indirect relations between factor "Simple production" and tax conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Simple production					
		Tax via joblessness			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote
None		18.140 ° (10.796)	22.936 *** (4.744)	25.157 ** (9.556)	0.161 (6.997)	6.991 ** (2.645)	5.354 (8.619)
Professional service	low	16.349 (10.442)	24.536 *** (5.441)	32.917 * (13.116)	1.479 (8.782)	3.048 (2.429)	1.375 (3.339)
	high	19.931 (12.226)	21.337 *** (5.696)	17.397 (13.921)	-1.157 (9.042)	10.933 * (4.243)	9.332 (14.996)
Primary and related production	low	24.064 ° (14.098)	22.890 *** (5.123)	13.394 (10.218)	-4.264 (7.923)	13.655 ** (4.404)	7.389 (11.845)
	high	12.217 (8.831)	22.983 *** (5.840)	36.920 ** (12.232)	4.585 (9.907)	0.326 (2.858)	3.318 (5.613)
Large scale production	low	17.131 (10.541)	17.382 *** (4.256)	12.415 (9.452)	0.606 (7.792)	8.429 ** (3.118)	5.126 (8.347)
	high	19.149 (11.665)	28.491 *** (5.960)	37.898 ** (14.215)	-0.285 (8.491)	5.552 * (2.746)	5.581 (9.154)
Trade services and food	low	18.337 (11.134)	20.747 *** (4.858)	18.965 * (9.387)	6.010 (8.065)	6.554 * (2.889)	4.804 (7.821)
	high	17.944 (11.412)	25.126 *** (5.365)	31.348 * (12.982)	-5.689 (9.838)	7.427 * (2.963)	5.903 (9.626)
Recreation service	low	14.365 (9.320)	19.457 *** (4.857)	23.351 * (10.541)	12.774 (10.051)	5.602 * (2.826)	3.877 (6.482)
	high	21.915 (13.905)	26.416 *** (6.003)	26.962 * (12.043)	-12.452 (11.769)	8.380 * (3.509)	6.830 (11.011)
Knowledge intensive production	low	22.055 ° (13.200)	23.623 *** (5.370)	19.285 ° (10.985)	2.316 (8.695)	9.529 ** (3.545)	8.546 (13.649)
	high	14.226 (9.385)	22.250 *** (5.151)	31.029 * (12.561)	-1.994 (8.625)	4.452 ° (2.616)	2.162 (4.164)
Health service	low	22.930 ° (13.673)	21.622 *** (4.878)	12.260 (9.519)	0.334 (8.544)	6.007 * (2.717)	2.845 (5.034)
	high	13.351 (8.715)	24.251 *** (5.233)	38.054 ** (13.409)	-0.012 (8.070)	7.975 ** (3.066)	7.863 (12.558)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

With respect to population development the regression is able to separate two countervailing relations. First, in contrast to the positive economic effects of a relative regional concentration in simple production, the direct effect of concentrated simple production on population development is negative (Table 19). This effect is significant for medium and remote regions. At

least in regions in average locations, this negative direct relation is often more than compensated for by the indirect positive relation to population development, which is mediated by the negative relation between simple production and unemployment.

Table 19: Direct and indirect relations between factor "Simple production" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Simple production					
		Population development direct			Population development via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-49.033 ° (29.503)	-0.689 ** (0.212)	-1.592 ** (0.498)	1.146 *** (0.331)	0.950 *** (0.139)	0.763 ** (0.271)
Professional service	low	-42.999 (38.145)	-0.388 (0.265)	-1.565 * (0.634)	1.033 ** (0.383)	1.016 *** (0.170)	0.998 ** (0.375)
	high	-55.067 (39.430)	-0.991 ** (0.350)	-1.619 ° (0.831)	1.259 ** (0.409)	0.883 *** (0.198)	0.528 (0.416)
Primary and related production	low	-69.294 * (33.302)	-0.908 *** (0.267)	-1.733 ** (0.630)	1.520 *** (0.409)	0.948 *** (0.161)	0.406 (0.305)
	high	-28.772 (42.929)	-0.471 (0.329)	-1.451 ** (0.530)	0.772 * (0.387)	0.951 *** (0.198)	1.120 ** (0.340)
Large scale production	low	-46.993 (33.406)	-0.863 *** (0.243)	-2.003 *** (0.560)	1.082 ** (0.356)	0.720 *** (0.142)	0.376 (0.282)
	high	-51.073 (36.816)	-0.516 ° (0.270)	-1.181 ° (0.698)	1.210 ** (0.383)	1.180 *** (0.177)	1.149 ** (0.403)
Trade services and food	low	-22.246 (33.254)	-0.742 ** (0.261)	-1.108 * (0.538)	1.158 ** (0.363)	0.859 *** (0.157)	0.575 * (0.274)
	high	-75.820 ° (42.218)	-0.637 * (0.249)	-2.076 ** (0.659)	1.133 ** (0.415)	1.040 *** (0.162)	0.951 * (0.373)
Recreation service	low	8.726 (38.755)	-0.379 (0.273)	-1.881 *** (0.569)	0.907 * (0.352)	0.806 *** (0.163)	0.708 * (0.305)
	high	-106.791 * (48.068)	-1.000 ** (0.306)	-1.303 * (0.641)	1.384 ** (0.503)	1.094 *** (0.191)	0.818 * (0.349)
Knowledge intensive production	low	-39.163 (37.605)	-0.416 (0.280)	-0.952 (0.655)	1.393 *** (0.412)	0.978 *** (0.171)	0.585 ° (0.324)
	high	-58.903 (37.316)	-0.963 *** (0.266)	-2.232 *** (0.608)	0.899 * (0.364)	0.921 *** (0.166)	0.941 ** (0.360)
Health service	low	-48.240 (37.072)	-0.677 ** (0.250)	-1.282 * (0.579)	1.448 *** (0.422)	0.895 *** (0.154)	0.372 (0.284)
	high	-49.826 (34.781)	-0.702 ** (0.251)	-1.902 ** (0.617)	0.843 * (0.333)	1.004 *** (0.160)	1.154 ** (0.376)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

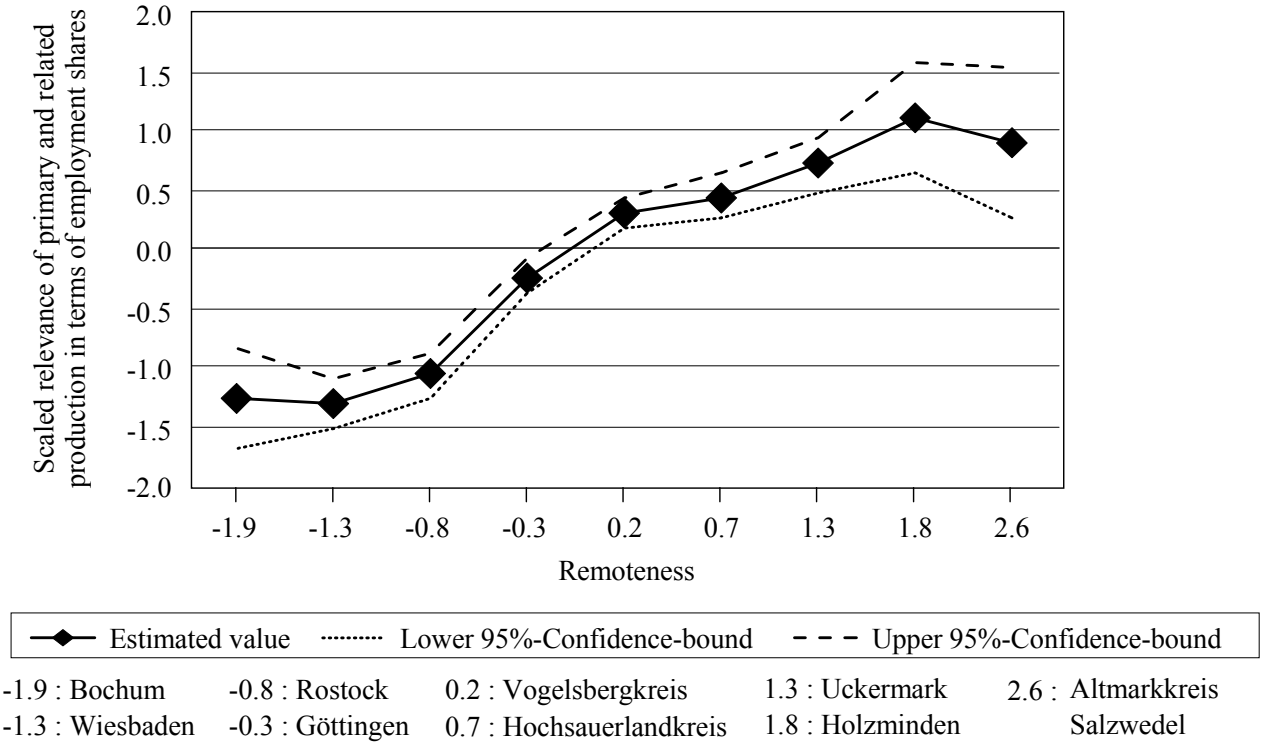
In conclusion, simple production tends to contribute to a more equal income distribution. It is rather favourable for regions in medium and remote locations. Nevertheless, in light of rather negative population developments, a shortage of labour might turn out to be a problem for the maintenance of a relatively high level of simple production in remote regions. Moreover, the high

labour market participation in regions with a high share of employees in simple production activities does not necessarily imply higher wages. Higher wages are realised in regions with a more diversified industry structure, specifically in the area of professional services.

4.3 Primary production and related activities

Unsurprisingly, primary production and related activities, which are usually associated with rural areas, rise in their relevance in terms of employment shares with districts' remoteness (Figure 4).

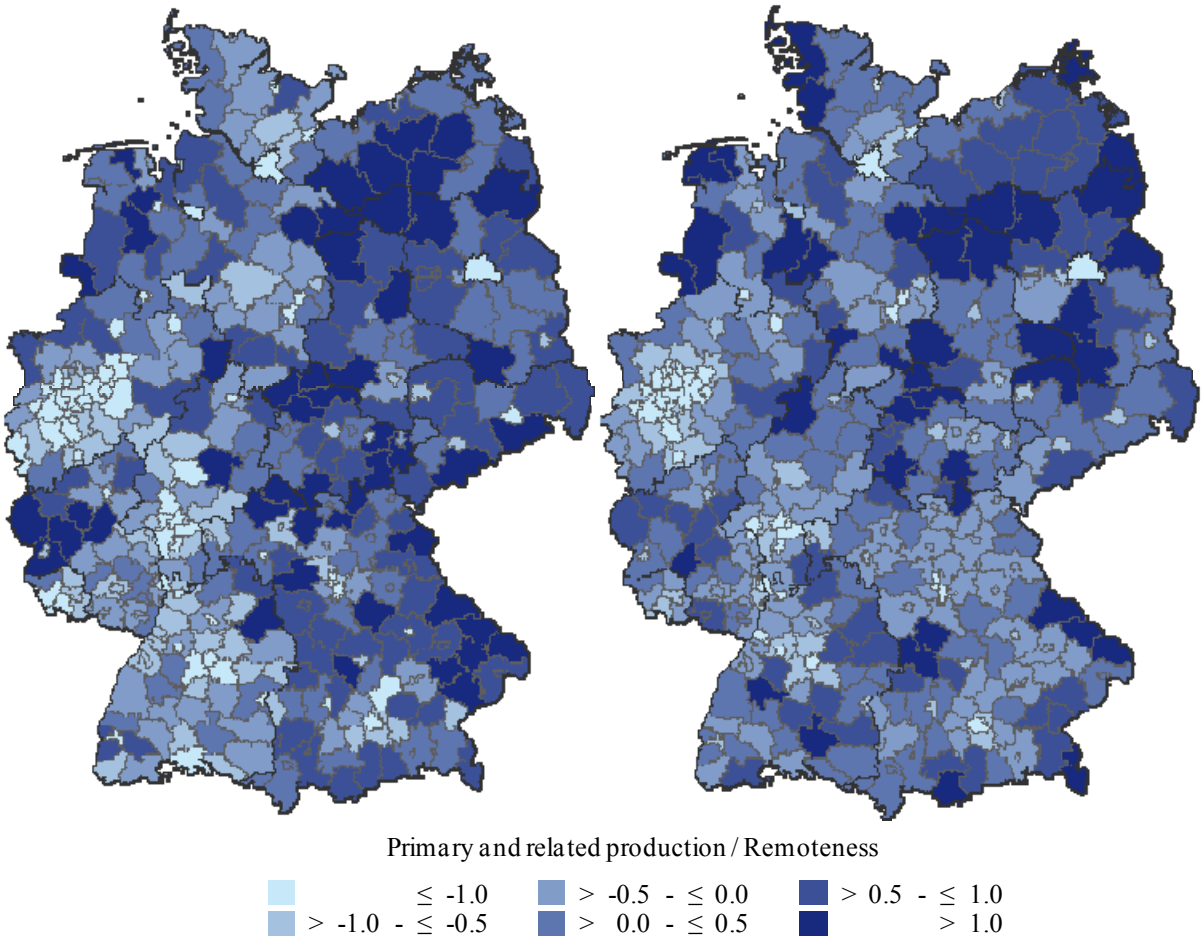
Figure 4: Industry response curve for "Primary production and related activities" with respect to remoteness



Source: Own figure based on own calculations

Map 10 clarifies that remoteness and a relatively high prevalence of primary and related activities are very similarly distributed in space. Nevertheless, in the north of Bavaria (south-eastern Germany), for example, there are rather central regions with a relatively high share of primary and related production, while in the south of Baden-Württemberg (south-western Germany), there are rather remote regions with a relatively low share of primary and related production; instead, there is a relatively high prevalence of simple production in these peripheral regions.

Map 10: Geographical distribution of industrial factor "Primary and related Production" (left) as compared to remoteness (right) (NUTS 3)



*Source: Own maps; basis for the map: GfK GeoMarketing (*2010).

The relation between primary production and GDP per inhabitant is not very strong (Appendix 1). More important seems to be the direct relation to regional unemployment (Table 20). Interestingly, unemployment is relatively low in central regions with a relatively high relevance of primary and related production. Such a situation is typically observed in regions with a certain rural character but close to cities and other centers with a high share of commuters in the population. While regions with a relatively high prevalence of primary production in central and medium locations are often characterised by commuter communities, a high prevalence of primary production in peripheral regions indicates a lack of alternative occupational opportunities. Therefore, the relation between a high share of primary and related activities and joblessness is positive here. Specifically regions with a high share of primary and related activities and a low level of simple production activities or of recreation services are characterised by high joblessness. The latter activities seem to be common occupational alternatives in peripheral regions. Unemployment in regions with a high share of primary and related activities is also high in peripheral regions characterised by relatively high relevance of knowledge intensive production activities. These seem not to provide relevant occupational alternatives, an

observation that hints at the existence of split labour markets. Moreover, a high share of primary production is usually negatively related to wages, at least in regions in medium and peripheral locations.

Table 20: Direct relations between factor "Primary production and related activities" and joblessness and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Primary and related production					
		Joblessness direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-2.820 *** (0.468)	-0.610 * (0.251)	1.601 ** (0.519)	34.927 (26.770)	-31.664 * (13.665)	-98.254 *** (28.360)
Professional service	low	-2.882 *** (0.482)	-0.797 ** (0.279)	1.289 ** (0.445)	-19.812 (28.668)	-48.754 ** (15.256)	-77.695 ** (25.085)
	high	-2.758 *** (0.678)	-0.422 (0.461)	1.913 ° (0.981)	89.666 * (37.310)	-14.574 (24.899)	-118.813 * (53.157)
Simple production	low	-3.634 *** (0.625)	-0.605 (0.414)	2.423 *** (0.696)	14.573 (36.229)	-26.574 (22.507)	-67.722 ° (38.294)
	high	-2.007 ** (0.672)	-0.614 * (0.292)	0.779 (0.555)	55.280 (36.644)	-36.754 * (15.846)	-128.787 *** (29.966)
Large scale production	low	-3.448 *** (0.603)	-1.023 ** (0.315)	1.401 * (0.693)	32.485 (33.889)	-18.080 (17.247)	-68.644 ° (37.554)
	high	-2.193 *** (0.601)	-0.196 (0.306)	1.801 ** (0.668)	37.368 (33.887)	-45.248 ** (16.553)	-127.864 *** (36.704)
Trade services and food	low	-2.830 *** (0.633)	-0.699 * (0.355)	1.433 * (0.675)	108.756 ** (35.009)	-20.961 (19.281)	-150.678 *** (36.627)
	high	-2.810 *** (0.641)	-0.520 ° (0.288)	1.769 ** (0.575)	-38.903 (36.252)	-42.367 ** (15.610)	-45.831 (31.958)
Recreation service	low	-3.168 *** (0.719)	-0.504 (0.375)	2.161 ** (0.718)	-24.185 (40.095)	-41.820 * (20.317)	-59.454 (39.208)
	high	-2.472 * (0.971)	-0.716 ° (0.420)	1.041 (0.633)	94.039 ° (54.653)	-21.508 (23.092)	-137.054 *** (34.677)
Knowledge intensive production	low	-2.085 *** (0.631)	-0.915 * (0.364)	0.255 (0.691)	22.700 (35.025)	-18.457 (19.918)	-59.615 (37.240)
	high	-3.556 *** (0.668)	-0.305 (0.418)	2.947 ** (0.921)	47.153 (37.456)	-44.871 * (22.514)	-136.894 ** (50.342)
Health service	low	-2.402 *** (0.589)	-0.310 (0.324)	1.783 * (0.703)	-42.170 (33.335)	-60.371 *** (17.533)	-78.572 * (38.435)
	high	-3.238 *** (0.664)	-0.909 ** (0.334)	1.419 * (0.670)	112.023 ** (36.932)	-2.957 (18.196)	-117.937 ** (36.286)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Interestingly, in those remote regions characterised by primary and related production, where wages are relatively low, there is positive *direct* relation between primary and related activities and household income. This positive relation can be observed in remote districts if primary and related production is accompanied by relatively high levels of professional services, knowledge-

intensive production or health services (Table 21). Accordingly, in these regions, either the labour market participation of population groups that does not usually appear in unemployment statistics is high or alternative income sources are mobilised. The direct relationship between household incomes in central regions and primary production, in contrast, is negative. This might be due to a lack of income-generating alternatives and additional income sources in the typical commuter communities. Nevertheless, the table also shows that this disadvantage of typical commuter communities is usually compensated for by the indirect positive relation of a focus on primary production and household income mediated by the negative relation towards unemployment.

Table 21: Direct and indirect relations between factor "Primary production and related activities" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Primary and related production					
		Household income direct			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-64.385 * (25.255)	-7.041 (12.760)	50.303 ° (27.881)	61.461 *** (18.210)	7.679 * (3.530)	-5.442 (8.242)
Professional service	low	-73.714 * (29.761)	-37.721 ** (14.240)	-1.728 (26.376)	62.810 *** (18.657)	10.036 * (4.079)	-4.380 (6.654)
	high	-55.057 (34.698)	23.639 (23.257)	102.334 * (49.469)	60.112 ** (20.882)	5.321 (5.911)	-6.504 (10.183)
Simple production	low	-1.126 (33.970)	39.962 ° (20.735)	81.049 * (36.115)	79.187 *** (23.739)	7.625 (5.448)	-8.236 (12.412)
	high	-127.645 *** (34.053)	-54.044 *** (14.960)	19.557 (29.951)	43.735 * (18.166)	7.733 ° (4.013)	-2.648 (4.348)
Large scale production	low	-88.823 ** (32.051)	-18.119 (15.921)	52.585 (35.986)	75.137 *** (22.651)	12.888 ** (4.773)	-4.764 (7.431)
	high	-39.948 (31.400)	4.036 (15.522)	48.021 (35.166)	47.785 ** (17.578)	2.470 (3.889)	-6.120 (9.335)
Trade services and food	low	-36.840 (33.193)	4.483 (17.935)	45.806 (36.238)	61.683 ** (20.485)	8.804 ° (4.822)	-4.869 (7.560)
	high	-91.931 ** (33.698)	-18.565 (14.514)	54.800 ° (30.086)	61.239 ** (20.518)	6.554 ° (3.872)	-6.014 (9.110)
Recreation service	low	-52.578 (38.750)	16.149 (18.787)	84.877 * (38.024)	69.045 ** (23.091)	6.343 (4.901)	-7.346 (11.139)
	high	-76.193 (50.461)	-30.232 (21.517)	15.729 (33.030)	53.877 * (24.958)	9.015 (5.603)	-3.538 (5.659)
Knowledge intensive production	low	-29.550 (32.579)	-11.684 (18.408)	6.182 (35.301)	45.434 * (17.702)	11.522 * (5.162)	-0.868 (2.676)
	high	-99.221 ** (35.030)	-2.398 (20.874)	94.424 * (47.654)	77.487 ** (23.965)	3.836 (5.321)	-10.016 (15.145)
Health service	low	-62.591 ° (32.112)	-27.462 ° (16.434)	7.666 (37.539)	52.352 ** (18.166)	3.903 (4.156)	-6.059 (9.277)
	high	-66.180 ° (34.407)	13.380 (16.839)	92.940 ** (34.244)	70.570 ** (22.581)	11.455 * (4.824)	-4.824 (7.492)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

A similar pattern is observable with respect to population development. Again, the direct negative relation between primary production focus and population development in central regions is compensated for by the positive relation between lower unemployment and population development (Table 22). Nevertheless, the negative direct relation to population development is usually not compensated by low joblessness in districts in medium location, and in remote regions population development is negative, mainly due to the lack of occupational alternatives.

Table 22: Direct and indirect relations between factor "Primary production and related activities" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Primary and related production					
		Population development direct			Population development via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-1.289 ** (0.421)	-0.823 *** (0.209)	-0.358 (0.458)	1.303 *** (0.351)	0.274 * (0.116)	-0.698 * (0.277)
Professional service	low	-2.013 *** (0.498)	-1.074 *** (0.237)	-0.134 (0.431)	1.332 *** (0.360)	0.358 ** (0.131)	-0.562 * (0.232)
	high	-0.565 (0.573)	-0.573 (0.379)	-0.582 (0.812)	1.275 ** (0.414)	0.190 (0.208)	-0.834 ° (0.468)
Simple production	low	-1.586 ** (0.566)	-1.043 ** (0.342)	-0.499 (0.593)	1.679 *** (0.459)	0.272 (0.188)	-1.056 ** (0.388)
	high	-0.992 ° (0.580)	-0.604 * (0.248)	-0.216 (0.501)	0.927 * (0.368)	0.276 * (0.134)	-0.340 (0.254)
Large scale production	low	-1.723 ** (0.543)	-0.875 *** (0.262)	-0.027 (0.595)	1.593 *** (0.439)	0.459 ** (0.149)	-0.611 ° (0.333)
	high	-0.855 ° (0.513)	-0.772 ** (0.253)	-0.688 (0.573)	1.013 ** (0.351)	0.088 (0.138)	-0.785 * (0.342)
Trade services and food	low	-1.703 ** (0.553)	-0.943 ** (0.294)	-0.183 (0.592)	1.308 ** (0.404)	0.314 ° (0.162)	-0.624 ° (0.327)
	high	-0.876 (0.556)	-0.704 ** (0.237)	-0.532 (0.497)	1.298 ** (0.405)	0.234 ° (0.132)	-0.771 * (0.306)
Recreation service	low	-1.311 * (0.634)	-0.511 ° (0.306)	0.289 (0.626)	1.464 ** (0.455)	0.226 (0.170)	-0.942 * (0.380)
	high	-1.268 (0.834)	-1.136 ** (0.353)	-1.004 ° (0.544)	1.142 * (0.510)	0.321 ° (0.191)	-0.454 (0.295)
Knowledge intensive production	low	-1.410 ** (0.538)	-0.683 * (0.302)	0.043 (0.577)	0.963 ** (0.356)	0.411 * (0.169)	-0.111 (0.302)
	high	-1.168 * (0.580)	-0.964 ** (0.341)	-0.759 (0.780)	1.643 *** (0.466)	0.137 (0.188)	-1.284 ** (0.497)
Health service	low	-0.930 ° (0.531)	-0.855 ** (0.270)	-0.781 (0.616)	1.110 ** (0.360)	0.139 (0.146)	-0.777 * (0.354)
	high	-1.649 ** (0.567)	-0.792 ** (0.277)	0.065 (0.564)	1.496 *** (0.442)	0.408 ** (0.156)	-0.619 ° (0.324)

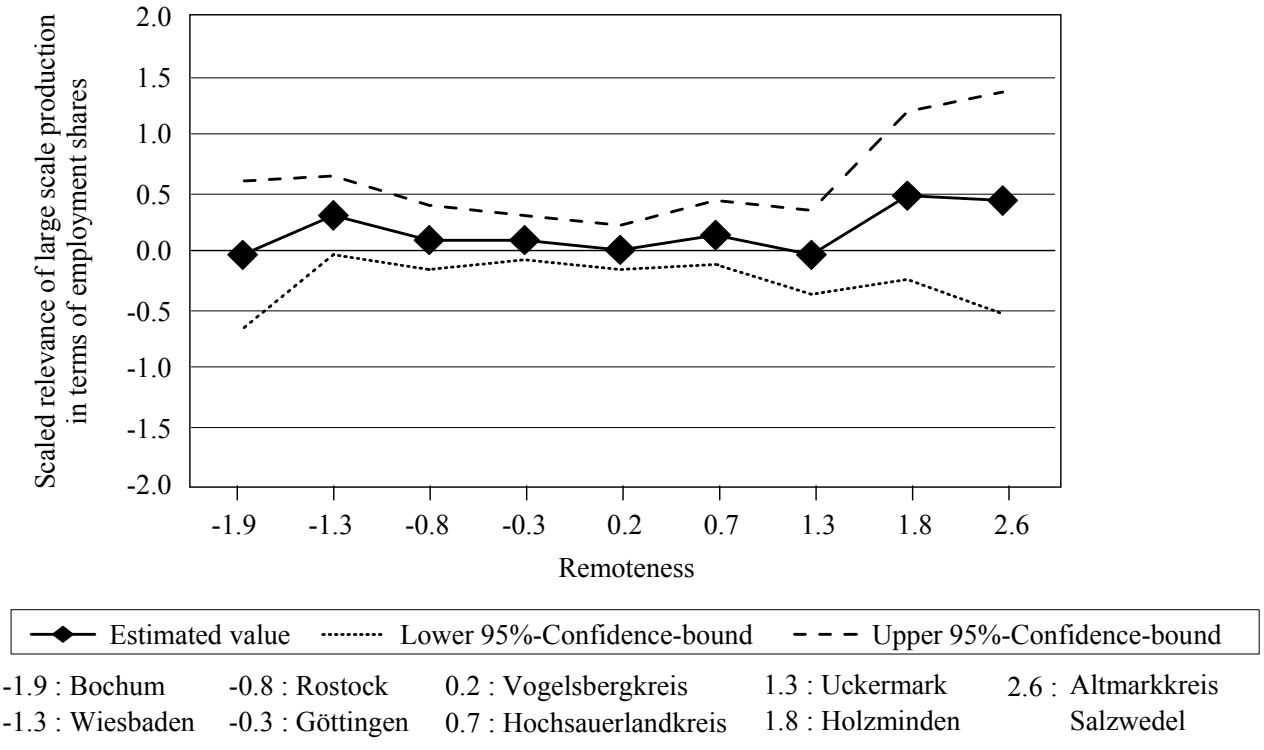
Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, the gross relationship between a high prevalence of primary and related production, and population development and the economic situation in terms of other indicators, is generally negative in regions of medium location, but specifically in those of remote location. The remarkable exception is the positive relation to household income in some peripheral regions. Accordingly, a relatively high share of primary and related production activities is usually a symptom of the lack of an endogenous economic dynamic within a region itself.

4.4 Large scale production

Evidently, there is no direct link between remoteness and the dominance of a single or few firms within specific industries (Figure 5).

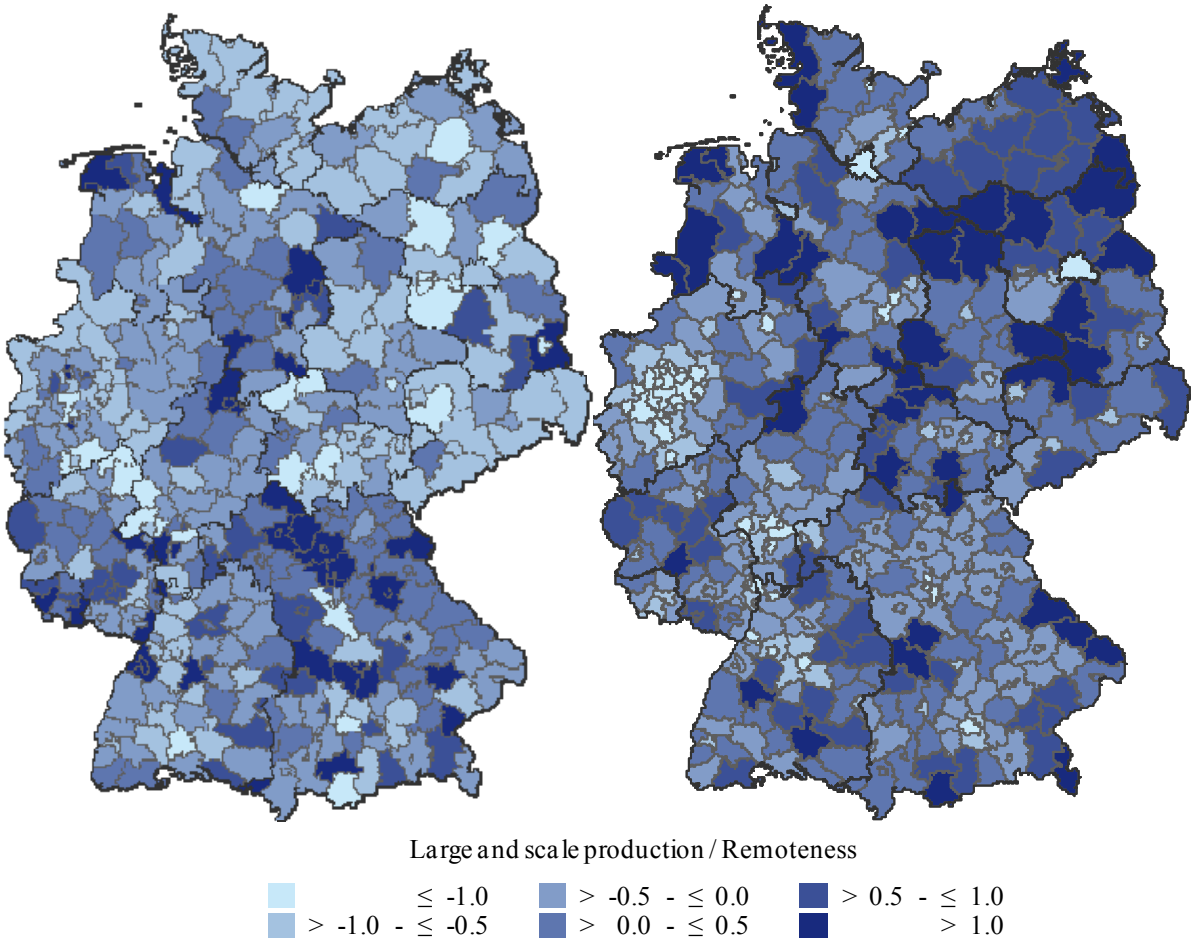
Figure 5: Industry response curve for "Large and Dominating Enterprise" with respect to population density



Source: Own figure based on own calculations

The map underscores this impression. Districts with dominating firms seem to be scattered rather randomly in space.

Map 11: Geographical distribution of industrial factor "Large scale production" (left) as compared to remoteness (right) (NUTS 3)



Source: Own map; basis for the map: GfK GeoMarketing (2010).

Again, the relation between unemployment and dominant firms is more relevant than the relation with GDP per inhabitant (see appendix). Especially in remote regions, there is a positive relation between unemployment and the existence of dominant firms (Table 23). At the same time, dominant firms go along with relatively high wages in regions in average and peripheral locations. Relatively high unemployment paralleled by relatively high wages might be interpreted as a symptom of segregated or split labour markets.

Table 23: Direct relations between factor "Large scale production" and joblessness and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Large scale production					
		Joblessness direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.602 (0.452)	0.400 * (0.184)	1.403 ** (0.491)	-15.828 (24.529)	44.126 *** (10.001)	104.080 *** (26.777)
Professional service	low	-0.989 (0.632)	-0.326 (0.300)	0.337 (0.755)	-18.724 (34.517)	54.247 *** (16.353)	127.217 ** (40.665)
	high	-0.215 (0.484)	1.127 ** (0.409)	2.468 ** (0.947)	-12.933 (26.066)	34.005 (22.311)	80.943 (51.586)
Simple production	low	-0.465 (0.514)	0.911 ** (0.287)	2.286 *** (0.674)	-13.795 (27.799)	46.815 ** (15.725)	107.425 ** (36.850)
	high	-0.739 (0.628)	-0.110 (0.205)	0.519 (0.665)	-17.861 (34.000)	41.437 *** (11.040)	100.735 ** (36.065)
Primary and related production	low	-1.225 * (0.537)	-0.010 (0.271)	1.205 (0.778)	-18.251 (29.723)	57.601 *** (14.630)	133.452 ** (42.321)
	high	0.020 (0.635)	0.810 ** (0.246)	1.600 ** (0.509)	-13.406 (34.200)	30.651 * (13.448)	74.708 ** (27.811)
Trade services and food	low	-0.419 (0.515)	0.959 *** (0.265)	2.338 ** (0.710)	-12.392 (27.897)	46.267 ** (14.536)	104.926 ** (38.876)
	high	-0.785 (0.568)	-0.159 (0.211)	0.468 (0.602)	-19.265 (30.758)	41.985 *** (11.417)	103.234 ** (32.453)
Recreation service	low	-0.172 (0.582)	0.180 (0.288)	0.533 (0.652)	140.492 *** (31.775)	104.950 *** (15.501)	69.407 ° (35.527)
	high	-1.032 (0.944)	0.620 ° (0.342)	2.272 ** (0.839)	-172.149 *** (51.898)	-16.698 (18.504)	138.753 ** (46.420)
Knowledge intensive production	low	-0.732 (0.498)	0.435 ° (0.249)	1.602 * (0.625)	-66.749 * (27.006)	26.738 * (13.491)	120.226 *** (33.951)
	high	-0.473 (0.534)	0.365 (0.239)	1.203 ° (0.691)	35.093 (28.924)	61.513 *** (12.896)	87.934 * (37.484)
Health service	low	-0.671 (0.569)	0.290 (0.212)	1.252 ° (0.641)	-25.116 (30.772)	56.563 *** (11.439)	138.243 *** (34.714)
	high	-0.533 (0.556)	0.510 * (0.255)	1.554 * (0.611)	-6.540 (30.160)	31.688 * (13.823)	69.917 * (33.270)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

At the same time, the direct relation between dominant firms and household income, as well as the indirect relation via unemployment, are generally negative (Table 24). This, too, hints at a relatively low labour market participation or potential for the mobilisation of alternative income sources in districts dominated by single large firms.

Table 24: Direct and indirect relations between factor "Large scale production" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Large scale production					
		Household income direct			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-35.882 (23.275)	-25.216 ** (9.460)	-14.550 (26.101)	13.120 (10.364)	-5.041 * (2.544)	-4.767 (7.248)
Professional service	low	-18.940 (32.361)	-11.114 (15.428)	-3.287 (39.401)	21.560 (14.752)	4.107 (3.869)	-1.146 (3.075)
	high	-52.825 * (24.518)	-39.318 ° (20.597)	-25.812 (47.705)	4.680 (10.607)	-14.190 * (5.923)	-8.388 (12.822)
Simple production	low	-12.344 (26.116)	-15.154 (14.631)	-17.964 (34.708)	10.125 (11.482)	-11.469 ** (4.318)	-7.769 (11.720)
	high	-59.421 ° (31.858)	-35.278 *** (10.424)	-11.136 (34.614)	16.115 (14.237)	1.387 (2.594)	-1.765 (3.453)
Primary and related production	low	-60.123 * (27.602)	-36.204 ** (13.783)	-12.286 (39.915)	26.686 * (13.409)	0.126 (3.420)	-4.094 (6.609)
	high	-11.641 (32.362)	-14.227 (12.452)	-16.814 (27.030)	-0.447 (13.833)	-10.208 ** (3.745)	-5.440 (8.232)
Trade services and food	low	-39.918 (26.760)	-23.446 ° (13.572)	-6.974 (37.260)	9.131 (11.452)	-12.083 ** (4.166)	-7.945 (12.000)
	high	-31.846 (28.549)	-26.986 * (10.703)	-22.126 (30.645)	17.109 (13.070)	2.000 (2.692)	-1.589 (3.117)
Recreation service	low	-55.858 ° (31.557)	-22.686 (15.116)	10.487 (34.080)	3.757 (12.720)	-2.272 (3.653)	-1.812 (3.479)
	high	-15.906 (48.447)	-27.746 (17.122)	-39.586 (43.487)	22.483 (21.292)	-7.811 ° (4.595)	-7.722 (11.775)
Knowledge intensive production	low	-88.196 *** (25.535)	-55.339 *** (12.548)	-22.482 (32.692)	15.942 (11.545)	-5.484 (3.332)	-5.446 (8.333)
	high	16.432 (27.399)	4.907 (12.217)	-6.617 (35.297)	10.298 (11.908)	-4.598 (3.152)	-4.088 (6.488)
Health service	low	-20.409 (28.912)	-18.391 ° (10.894)	-16.372 (33.459)	14.624 (12.914)	-3.656 (2.772)	-4.254 (6.660)
	high	-51.355 ° (28.285)	-32.041 * (12.810)	-12.727 (31.479)	11.616 (12.456)	-6.427 ° (3.475)	-5.280 (8.084)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The direct relation between dominant firms and taxes is negative as well (Table 25). Nevertheless, this is partly compensated for by the higher tax revenues that are due to higher wages.

Table 25: Direct and indirect relations between factor "Large scale production" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Large scale production					
		Tax direct			Tax via wages		
		Central	Medium	Remote	Central	Medium	Remote
None		-14.019 (16.891)	-21.843 ** (6.995)	-1.973 (3.139)	-3.325 (5.261)	7.601 ** (2.366)	13.996 (9.905)
Professional service	low	-22.425 (23.383)	1.326 (11.159)	1.667 (3.277)	-3.933 (7.359)	9.345 ** (3.451)	17.107 (12.535)
	high	-5.613 (17.922)	-45.011 ** (15.067)	-5.613 (8.737)	-2.717 (5.544)	5.858 (4.041)	10.884 (9.981)
Simple production	low	-14.634 (18.889)	-15.322 (10.725)	-1.065 (2.166)	-2.898 (5.913)	8.065 * (3.209)	14.445 (10.736)
	high	-13.403 (23.139)	-28.363 *** (7.667)	-2.881 (4.679)	-3.752 (7.242)	7.138 ** (2.436)	13.546 (10.163)
Primary and related production	low	1.043 (20.393)	-19.174 ° (10.083)	-2.619 (4.227)	-3.834 (6.363)	9.923 ** (3.291)	17.945 (13.130)
	high	-29.080 (23.441)	-24.512 ** (9.130)	-1.326 (2.376)	-2.816 (7.241)	5.280 * (2.576)	10.046 (7.607)
Trade services and food	low	-6.379 (19.421)	-26.887 ** (9.978)	-3.151 (4.994)	-2.603 (5.919)	7.970 ** (3.027)	14.109 (10.671)
	high	-21.659 (20.667)	-16.799 * (7.827)	-0.794 (1.834)	-4.047 (6.590)	7.233 ** (2.499)	13.882 (10.140)
Recreation service	low	-65.112 ** (23.252)	-32.014 ** (10.967)	0.072 (1.700)	29.512 * (11.564)	18.079 *** (4.690)	9.333 (7.790)
	high	37.075 (35.062)	-11.672 (12.529)	-4.017 (6.533)	-36.162 * (15.898)	-2.877 (3.246)	18.658 (13.795)
Knowledge intensive production	low	-13.634 (18.961)	-9.138 (9.361)	-0.309 (1.579)	-14.022 ° (7.233)	4.606 ° (2.523)	16.167 (11.596)
	high	-14.403 (19.822)	-34.548 *** (8.913)	-3.637 (5.857)	7.372 (6.518)	10.597 *** (3.169)	11.824 (9.284)
Health service	low	-9.117 (20.897)	-18.621 * (7.951)	-1.870 (3.222)	-5.276 (6.681)	9.744 *** (2.864)	18.589 (13.116)
	high	-18.920 (20.590)	-25.065 ** (9.437)	-2.075 (3.328)	-1.374 (6.351)	5.459 * (2.651)	9.402 (7.645)

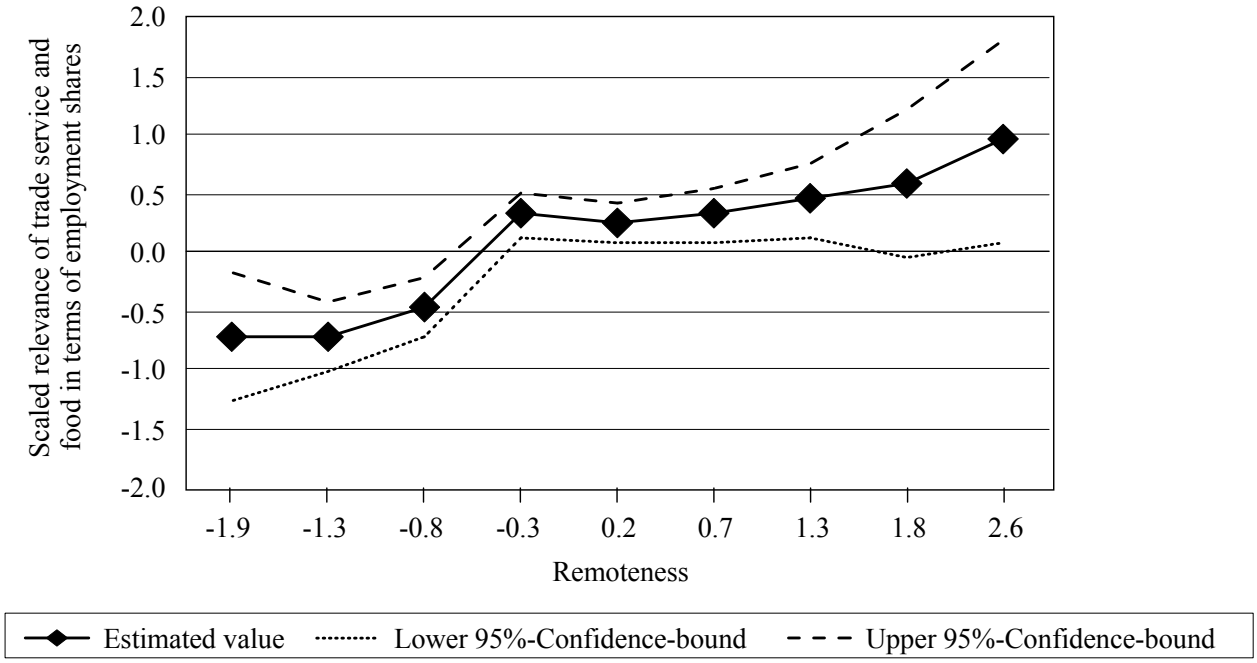
Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, dominant firms relate positively to wages in remote regions but at the same time they are negatively related to labour market participation and alternative income opportunities and tax revenues in regions in average locations.

4.5 Trade service and food

Trade service and food production-related activities have a relatively low prevalence in central regions and a relatively high prevalence in all other regions independent of their remoteness (Figure 6).

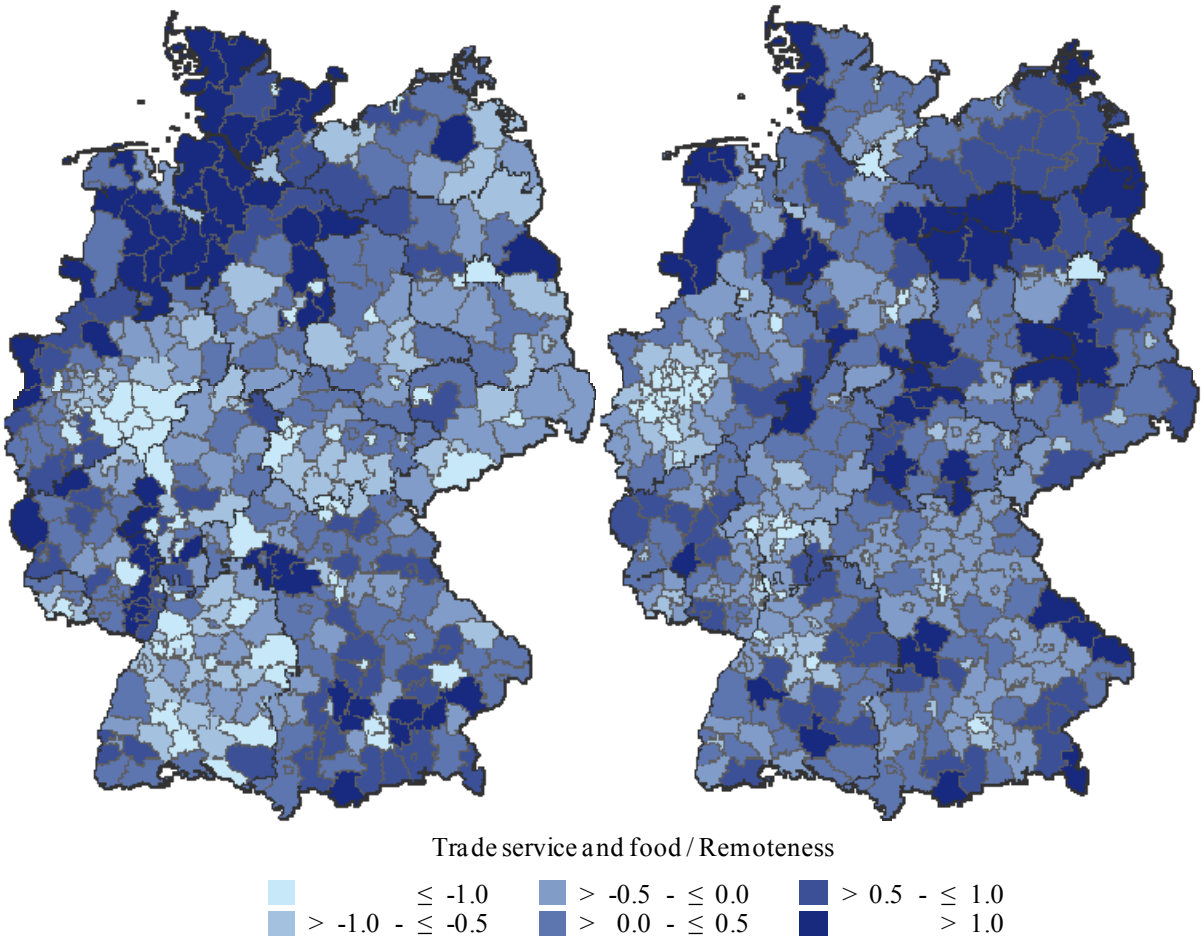
Figure 6: Industry response curve for trade service and food with respect to remoteness



Source: Own figure based on own calculations

Map 12 shows that the prevalence of retail and food production is highest in Germany's north-west.

Map 12: Geographical distribution of industrial factor "Trade service and food" (left) as compared remoteness (right) (NUTS 3)



Source: Own map based on own calculations; basis for the map: GfK GeoMarketing (2010).

A high relevance of activities of retail and food production is negatively related to regional productivity as indicated by GDP per inhabitant (Table 26). This negative relation is more important for central regions and less so for remote districts. In central regions a relatively high prevalence of trade services and food related activities seems to hint at a lack of positive specialisation or localisation effects, as the negative relation is specifically strong in central districts with a high prevalence of large scale production, knowledge-intensive production and health services, respectively, with a low share in primary and related production. The relation of trade services and food-related activities to wages is negative in all types of regions, independent of their location. In remote districts the negative relation to wages is specifically strong if there is a low prevalence of primary and related production, which again hints at a possible complementarity between the two industrial factors.

Table 26: Direct relations between factor "Trade service and food" and GDP and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		GDP direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-5.253 *** (1.232)	-3.114 *** (0.468)	-0.975 (1.265)	-96.293 ** (29.737)	-84.234 *** (11.435)	-72.174 * (30.281)
Professional service	low	-6.240 *** (1.665)	-2.565 *** (0.719)	1.111 (1.675)	-109.739 ** (39.846)	-76.278 *** (16.692)	-42.818 (39.335)
	high	-4.265 ** (1.532)	-3.663 *** (0.832)	-3.062 (2.041)	-82.848 * (35.672)	-92.189 *** (19.698)	-101.530 * (47.517)
Simple production	low	-4.144 ** (1.392)	-2.993 *** (0.676)	-1.841 (1.558)	-68.619 * (32.550)	-58.675 *** (15.840)	-48.732 (35.885)
	high	-6.361 *** (1.847)	-3.235 *** (0.584)	-0.109 (1.652)	-123.968 ** (43.973)	-109.792 *** (14.099)	-95.616 * (39.967)
Primary and related production	low	-7.325 *** (1.404)	-4.221 *** (0.647)	-1.118 (1.721)	-20.361 (34.978)	-73.226 *** (15.739)	-126.091 ** (41.600)
	high	-3.181 ° (1.805)	-2.007 ** (0.711)	-0.833 (1.302)	-172.226 *** (41.420)	-95.242 *** (16.425)	-18.257 (30.020)
Large scale production	low	-2.268 (1.451)	-2.528 *** (0.583)	-2.788 ° (1.651)	-92.731 ** (33.918)	-82.014 *** (13.648)	-71.297 ° (38.781)
	high	-8.237 *** (1.389)	-3.700 *** (0.615)	0.838 (1.664)	-99.856 ** (34.324)	-86.454 *** (15.083)	-73.051 ° (39.310)
Recreation service	low	-3.808 * (1.715)	-2.929 *** (0.736)	-2.051 (1.845)	-63.134 (39.602)	-74.152 *** (17.273)	-85.170 * (42.412)
	high	-6.698 ** (2.112)	-3.299 *** (0.757)	0.101 (1.825)	-129.453 ** (50.084)	-94.315 *** (17.856)	-59.178 (43.477)
Knowledge intensive production	low	-2.685 ° (1.388)	-2.562 *** (0.608)	-2.438 (1.643)	-123.285 *** (33.112)	-101.756 *** (14.311)	-80.227 * (38.779)
	high	-7.820 *** (1.744)	-3.666 *** (0.669)	0.488 (2.207)	-69.301 ° (41.318)	-66.711 *** (16.027)	-64.121 (51.266)
Health service	low	-2.776 ° (1.473)	-1.921 ** (0.596)	-1.067 (1.613)	-92.606 ** (34.540)	-75.570 *** (13.935)	-58.533 (37.357)
	high	-7.730 *** (1.700)	-4.307 *** (0.691)	-0.884 (1.699)	-99.980 * (40.654)	-92.898 *** (16.694)	-85.816 * (40.375)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Joblessness is negatively related to a high share of trade services and food-related activities, at least in regions of medium and peripheral locations (Table 27). But this dampening effect on unemployment is partly undone by the positive indirect relation to unemployment mediated by GDP, specifically in regions of medium and central locations. The relative high relevance of the indirect effect on joblessness via GDP as compared to the direct effect in central regions hints at the importance of multiplier and income effects for the creation of jobs in agglomerated regions. In terms of job creation by trade services in remote districts, the industry mix seems to be important, as trade services' negative relation to joblessness is significant in remote regions with

a high share of professional services, simple production, large scale production, recreation services, knowledge-intensive production and health services. Trade services alone do not seem to supply sufficient jobs in remote areas. This, too, hints at the potential relevance of income generated in other industries for the creation of jobs in trade services and food-related activities.

Table 27: Direct and indirect relations between factor "Trade service and food" and joblessness conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Joblessness direct			Joblessness via GDP		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.091 (0.535)	-0.709 *** (0.209)	-1.327 * (0.538)	0.564 * (0.267)	0.392 *** (0.097)	0.141 (0.193)
Professional service	low	-0.044 (0.717)	-0.277 (0.309)	-0.510 (0.712)	0.670 * (0.329)	0.322 ** (0.110)	-0.160 (0.252)
	high	-0.138 (0.656)	-1.141 ** (0.360)	-2.144 * (0.865)	0.458 ° (0.250)	0.461 *** (0.138)	0.441 (0.355)
Simple production	low	-0.119 (0.594)	-0.500 ° (0.293)	-0.882 (0.659)	0.445 ° (0.236)	0.376 *** (0.113)	0.265 (0.254)
	high	-0.063 (0.800)	-0.918 *** (0.257)	-1.772 * (0.707)	0.683 * (0.344)	0.407 *** (0.109)	0.016 (0.238)
Primary and related production	low	-0.101 (0.617)	-0.801 ** (0.289)	-1.500 * (0.734)	0.786 * (0.357)	0.531 *** (0.132)	0.161 (0.259)
	high	-0.080 (0.766)	-0.617 * (0.303)	-1.154 * (0.550)	0.341 (0.239)	0.252 * (0.102)	0.120 (0.195)
Large scale production	low	0.099 (0.614)	-0.129 (0.253)	-0.357 (0.700)	0.243 (0.185)	0.318 ** (0.096)	0.402 (0.299)
	high	-0.281 (0.623)	-1.289 *** (0.272)	-2.296 ** (0.709)	0.884 * (0.393)	0.465 *** (0.120)	-0.121 (0.246)
Recreation service	low	-0.530 (0.733)	-0.778 * (0.318)	-1.026 (0.781)	0.409 (0.249)	0.368 ** (0.118)	0.296 (0.297)
	high	0.348 (0.903)	-0.640 ° (0.330)	-1.628 * (0.776)	0.719 ° (0.373)	0.415 *** (0.125)	-0.014 (0.263)
Knowledge intensive production	low	-1.067 ° (0.591)	-0.554 * (0.264)	-0.040 (0.704)	0.288 (0.190)	0.322 ** (0.099)	0.351 (0.285)
	high	0.885 (0.757)	-0.864 ** (0.294)	-2.614 ** (0.932)	0.839 * (0.393)	0.461 *** (0.124)	-0.070 (0.320)
Health service	low	-0.468 (0.624)	-0.668 ** (0.256)	-0.868 (0.683)	0.298 (0.200)	0.242 ** (0.089)	0.154 (0.243)
	high	0.286 (0.743)	-0.750 * (0.306)	-1.786 * (0.722)	0.830 * (0.387)	0.542 *** (0.137)	0.127 (0.252)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central and medium regions, the negative relation of trade services and food-related activities to GDP and the positive relation to joblessness via GDP additionally cause an indirect negative relation to household income (Table 28 and 29).

Table 28: Indirect relations between factor "Trade service and food" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food		
		Household income via GDP		
		Central	Medium	Remote
None		-30.092 * (15.068)	-11.773 * (5.007)	-1.787 (4.567)
Professional service	low	-35.750 ° (18.472)	-9.696 * (4.720)	2.036 (5.432)
	high	-24.434 ° (13.925)	-13.850 * (6.346)	-5.610 (12.906)
Simple production	low	-23.742 ° (13.187)	-11.315 * (5.176)	-3.374 (7.958)
	high	-36.442 ° (19.284)	-12.231 * (5.345)	-0.200 (3.060)
Primary and related production	low	-41.962 * (20.232)	-15.959 * (6.805)	-2.048 (5.504)
	high	-18.222 (13.113)	-7.587 ° (4.042)	-1.526 (4.120)
Large scale production	low	-12.993 (10.107)	-9.558 * (4.395)	-5.110 (11.650)
	high	-47.191 * (22.344)	-13.988 * (6.032)	1.535 (4.552)
Recreation service	low	-21.814 (13.773)	-11.075 * (5.211)	-3.759 (8.940)
	high	-38.370 ° (20.847)	-12.471 * (5.729)	0.184 (3.369)
Knowledge intensive production	low	-15.381 (10.468)	-9.685 * (4.488)	-4.468 (10.288)
	high	-44.803 * (22.198)	-13.861 * (6.068)	0.894 (4.497)
Health service	low	-15.901 (10.985)	-7.263 * (3.664)	-1.954 (5.221)
	high	-44.283 * (21.878)	-16.283 * (6.985)	-1.620 (4.734)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Nevertheless, in some regions these negative indirect effects on household income via GDP are partly compensated by an indirect positive effect mediated by joblessness alone (Table 28). This compensation is specifically strong in regions of medium location where the retail and food production activities are accompanied by a relatively high relevance of large scale production or of professional services. This is specifically the case in districts of medium location with a complementary high relevance of professional services, simple production activities and large scale production, underlining again the relevance of the industry mix for trade services to become effective in the provision of jobs.

Table 29: Further indirect relations between factor "Trade service and food" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Household income via joblessness			Household income via GDP and joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		1.982 (11.664)	8.929 ** (3.211)	4.510 (6.919)	-12.285 ° (6.557)	-4.932 ** (1.588)	-0.478 (0.965)
Professional service	low	0.963 (15.630)	3.492 (3.963)	1.734 (3.528)	-14.595 ° (8.009)	-4.062 * (1.623)	0.544 (1.176)
	high	3.000 (14.311)	14.367 ** (5.417)	7.286 (11.173)	-9.975 ° (5.976)	-5.802 ** (2.114)	-1.500 (2.526)
Simple production	low	2.587 (12.968)	6.302 (3.910)	2.998 (4.968)	-9.693 ° (5.674)	-4.740 ** (1.723)	-0.902 (1.590)
	high	1.377 (17.429)	11.557 ** (4.014)	6.023 (9.229)	-14.878 ° (8.339)	-5.124 ** (1.728)	-0.054 (0.814)
Primary and related production	low	2.210 (13.460)	10.086 * (4.191)	5.099 (7.946)	-17.132 ° (8.845)	-6.685 ** (2.162)	-0.548 (1.195)
	high	1.753 (16.691)	7.772 ° (4.142)	3.921 (6.096)	-7.439 (5.527)	-3.178 * (1.445)	-0.408 (0.897)
Large scale production	low	-2.154 (13.397)	1.629 (3.204)	1.215 (2.983)	-5.305 (4.241)	-4.004 ** (1.467)	-1.366 (2.263)
	high	6.118 (13.650)	16.230 *** (4.785)	7.805 (11.797)	-19.266 * (9.792)	-5.860 ** (1.932)	0.410 (1.033)
Recreation service	low	11.545 (16.219)	9.798 * (4.482)	3.487 (5.802)	-8.906 (5.859)	-4.639 ** (1.762)	-1.005 (1.798)
	high	-7.582 (19.776)	8.061 ° (4.473)	5.533 (8.601)	-15.665 ° (8.989)	-5.224 ** (1.911)	0.049 (0.898)
Knowledge intensive production	low	23.251 (14.094)	6.972 ° (3.623)	0.137 (2.401)	-6.280 (4.428)	-4.057 ** (1.504)	-1.195 (2.015)
	high	-19.288 (17.164)	10.886 * (4.328)	8.884 (13.520)	-18.291 ° (9.672)	-5.807 ** (1.964)	0.239 (1.143)
Health service	low	10.192 (13.833)	8.410 * (3.659)	2.949 (4.942)	-6.492 (4.642)	-3.043 * (1.281)	-0.523 (1.130)
	high	-6.228 (16.274)	9.449 * (4.323)	6.071 (9.311)	-18.079 ° (9.536)	-6.821 ** (2.230)	-0.433 (1.068)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Tax revenues are relatively low in districts of central and medium location due to the low regional productivity (Table 30). This effect is amplified significantly via the additional higher unemployment due to the lower GDP per inhabitant (Table 31).

Table 30: Indirect relations between factor "Trade service and food" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food		
		Tax via GDP		
		Central	Medium	Remote
None		-41.493 ** (13.763)	-26.024 *** (5.189)	-8.597 (11.510)
Professional service	low	-49.295 ** (17.515)	-21.433 ** (6.635)	9.794 (15.114)
	high	-33.691 * (14.455)	-30.615 *** (8.031)	-26.989 (20.087)
Simple production	low	-32.737 * (13.410)	-25.011 *** (6.529)	-16.230 (14.748)
	high	-50.248 ** (18.755)	-27.038 *** (6.035)	-0.964 (14.570)
Primary and related production	low	-57.860 *** (17.526)	-35.278 *** (7.117)	-9.854 (15.520)
	high	-25.125 (15.430)	-16.770 ** (6.337)	-7.340 (11.728)
Large scale production	low	-17.915 (12.208)	-21.129 *** (5.603)	-24.580 (16.676)
	high	-65.070 *** (18.800)	-30.920 *** (6.545)	7.385 (14.870)
Recreation service	low	-30.078 * (15.276)	-24.482 *** (6.937)	-18.081 (17.333)
	high	-52.907 * (20.794)	-27.567 *** (7.290)	0.886 (16.093)
Knowledge intensive production	low	-21.209 ° (12.043)	-21.408 *** (5.807)	-21.495 (16.136)
	high	-61.777 ** (19.995)	-30.641 *** (6.888)	4.300 (19.506)
Health service	low	-21.925 ° (12.719)	-16.055 ** (5.405)	-9.402 (14.555)
	high	-61.060 ** (19.632)	-35.994 *** (7.457)	-7.792 (15.196)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Nevertheless, similar to household income, the negative tax effect is partially compensated mediated by the relatively low joblessness in regions with a high prevalence of retail and food production (Table 31). This positive indirect relation to tax revenues via lower joblessness is specifically strong in remote districts with a high share of professional services, of simple, large scale or knowledge intensive production or health services in accordance with the discussion above.

Table 31: Indirect relations between factor "Trade service and food" and tax revenues via joblessness conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Tax via joblessness			Tax via GDP and joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		0.665 (3.930)	7.688 ** (2.649)	19.074 * (9.237)	-4.124 (3.032)	-4.246 ** (1.295)	-2.021 (2.826)
Professional service	low	0.323 (5.249)	3.006 (3.398)	7.334 (10.420)	-4.899 (3.655)	-3.497 ** (1.350)	2.302 (3.673)
	high	1.007 (4.831)	12.370 ** (4.486)	30.814 * (14.864)	-3.348 (2.625)	-4.995 ** (1.745)	-6.344 (5.373)
Simple production	low	0.868 (4.375)	5.426 (3.319)	12.677 (10.045)	-3.254 (2.517)	-4.081 ** (1.422)	-3.815 (3.794)
	high	0.462 (5.855)	9.951 ** (3.300)	25.471 * (12.197)	-4.994 (3.770)	-4.412 ** (1.417)	-0.227 (3.426)
Primary and related production	low	0.742 (4.534)	8.684 * (3.495)	21.564 ° (11.992)	-5.751 (4.155)	-5.756 ** (1.764)	-2.316 (3.766)
	high	0.588 (5.611)	6.692 ° (3.498)	16.584 ° (9.044)	-2.497 (2.244)	-2.736 * (1.212)	-1.725 (2.844)
Large scale production	low	-0.723 (4.512)	1.402 (2.755)	5.139 (10.158)	-1.781 (1.684)	-3.447 ** (1.212)	-5.778 (4.563)
	high	2.054 (4.698)	13.974 *** (3.859)	33.010 * (13.415)	-6.467 (4.636)	-5.045 ** (1.580)	1.736 (3.565)
Recreation service	low	3.875 (5.786)	8.436 * (3.759)	14.749 (11.881)	-2.989 (2.480)	-3.995 ** (1.460)	-4.250 (4.422)
	high	-2.545 (6.762)	6.940 ° (3.784)	23.400 ° (12.756)	-5.258 (4.021)	-4.498 ** (1.579)	0.208 (3.784)
Knowledge intensive production	low	7.805 (6.161)	6.003 * (3.058)	0.577 (10.117)	-2.108 (1.829)	-3.493 ** (1.244)	-5.053 (4.308)
	high	-6.474 (6.626)	9.373 ** (3.598)	37.571 * (16.672)	-6.140 (4.492)	-4.999 ** (1.611)	1.011 (4.603)
Health service	low	3.421 (4.955)	7.241 * (3.061)	12.473 (10.353)	-2.179 (1.908)	-2.620 * (1.069)	-2.210 (3.536)
	high	-2.091 (5.564)	8.135 * (3.626)	25.675 * (12.400)	-6.069 (4.434)	-5.873 ** (1.821)	-1.832 (3.648)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Nevertheless, tax revenues are additionally negatively related to a high share of retail and food production activities due to the relatively low wages in respective regions. This effect is amplified via the additional indirect negative effect of relatively low regional productivity (GDP per inhabitant) on wages (Table 32).

Table 32: Further indirect relations between factor "Trade service and food" and tax revenues via wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Tax via wages			Tax via GDP and wages		
		Central	Medium	Remote	Central	Medium	Remote
None		-20.228 * (8.995)	-14.511 *** (3.668)	-9.705 (7.585)	-3.449 (3.143)	-7.281 *** (2.038)	-3.150 (4.609)
Professional service	low	-23.052 * (11.157)	-13.140 ** (4.015)	-5.758 (6.511)	-4.097 (3.770)	-5.996 ** (2.199)	3.588 (5.929)
	high	-17.403 ° (9.336)	-15.881 *** (4.794)	-13.653 (11.039)	-2.800 (2.663)	-8.565 ** (2.807)	-9.888 (9.394)
Simple production	low	-14.414 ° (8.248)	-10.108 ** (3.477)	-6.553 (6.477)	-2.721 (2.565)	-6.997 ** (2.286)	-5.947 (6.444)
	high	-26.041 * (12.440)	-18.914 *** (4.708)	-12.857 (10.037)	-4.177 (3.873)	-7.564 *** (2.250)	-0.353 (5.342)
Primary and related production	low	-4.277 (7.474)	-12.614 *** (3.819)	-16.955 (12.501)	-4.809 (4.334)	-9.869 *** (2.780)	-3.611 (6.073)
	high	-36.178 * (14.482)	-16.407 *** (4.500)	-2.455 (4.349)	-2.088 (2.188)	-4.692 * (1.998)	-2.689 (4.581)
Large scale production	low	-19.479 * (9.467)	-14.128 *** (3.822)	-9.587 (8.195)	-1.489 (1.621)	-5.911 ** (1.951)	-9.006 (8.099)
	high	-20.976 * (9.851)	-14.893 *** (4.104)	-9.823 (8.360)	-5.409 (4.849)	-8.650 *** (2.499)	2.706 (5.677)
Recreation service	low	-13.262 (9.339)	-12.774 ** (4.034)	-11.453 (9.463)	-2.500 (2.473)	-6.849 ** (2.362)	-6.625 (7.458)
	high	-27.193 * (13.653)	-16.247 *** (4.633)	-7.958 (7.855)	-4.398 (4.113)	-7.712 ** (2.541)	0.325 (5.899)
Knowledge intensive production	low	-25.898 * (10.819)	-17.529 *** (4.478)	-10.788 (8.820)	-1.763 (1.800)	-5.989 ** (2.006)	-7.875 (7.521)
	high	-14.558 (9.851)	-11.492 ** (3.692)	-8.622 (8.936)	-5.135 (4.664)	-8.572 *** (2.560)	1.575 (7.207)
Health service	low	-19.453 * (9.560)	-13.018 *** (3.670)	-7.871 (7.223)	-1.822 (1.874)	-4.492 * (1.751)	-3.445 (5.708)
	high	-21.002 ° (10.867)	-16.003 *** (4.463)	-11.540 (9.347)	-5.075 (4.606)	-10.070 *** (2.876)	-2.855 (5.817)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

On the other hand, there is a positive direct relation between trade service and food-related activities and population development (Table 33), which is amplified in regions of medium and peripheral locations by the relatively low joblessness (Table 34).

Table 33: Direct and indirect relations between factor "Trade service and food" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Population development direct			Population development via GDP		
		Central	Medium	Remote	Central	Medium	Remote
None		0.706 (0.454)	0.705 *** (0.186)	0.704 (0.467)	-0.796 ** (0.307)	-0.050 (0.084)	0.117 (0.167)
Professional service	low	0.643 (0.605)	0.577 * (0.260)	0.510 (0.593)	-0.946 * (0.384)	-0.041 (0.070)	-0.133 (0.216)
	high	0.768 (0.547)	0.833 ** (0.304)	0.898 (0.729)	-0.646 * (0.305)	-0.059 (0.100)	0.366 (0.329)
Simple production	low	0.098 (0.496)	0.651 ** (0.246)	1.204 * (0.546)	-0.628 * (0.285)	-0.048 (0.081)	0.220 (0.229)
	high	1.313 ° (0.672)	0.759 *** (0.228)	0.204 (0.616)	-0.964 * (0.406)	-0.052 (0.088)	0.013 (0.198)
Primary and related production	low	0.280 (0.528)	0.582 * (0.247)	0.884 (0.642)	-1.110 ** (0.401)	-0.068 (0.114)	0.134 (0.221)
	high	1.131 ° (0.640)	0.828 ** (0.257)	0.524 (0.461)	-0.482 (0.311)	-0.032 (0.055)	0.100 (0.167)
Large scale production	low	0.876 ° (0.514)	0.668 ** (0.216)	0.461 (0.586)	-0.344 (0.244)	-0.040 (0.069)	0.333 (0.282)
	high	0.536 (0.526)	0.741 ** (0.240)	0.947 (0.615)	-1.249 ** (0.436)	-0.059 (0.100)	-0.100 (0.208)
Recreation service	low	0.909 (0.596)	0.848 ** (0.270)	0.787 (0.652)	-0.577 ° (0.314)	-0.047 (0.080)	0.245 (0.266)
	high	0.502 (0.758)	0.562 * (0.280)	0.621 (0.657)	-1.015 * (0.446)	-0.053 (0.090)	-0.012 (0.218)
Knowledge intensive production	low	0.335 (0.507)	0.857 *** (0.231)	1.378 * (0.597)	-0.407 ° (0.244)	-0.041 (0.070)	0.292 (0.264)
	high	1.076 ° (0.630)	0.553 * (0.249)	0.030 (0.788)	-1.185 ** (0.448)	-0.059 (0.100)	-0.058 (0.266)
Health service	low	0.718 (0.527)	0.819 *** (0.219)	0.919 (0.570)	-0.421 (0.258)	-0.031 (0.053)	0.128 (0.208)
	high	0.693 (0.615)	0.591 * (0.263)	0.489 (0.618)	-1.172 ** (0.441)	-0.069 (0.117)	0.106 (0.213)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central regions, in contrast, the gross relation between a high prevalence of activities in trade services and population development is negative due to the mediation by a low GDP per inhabitant in central regions with high relevance of trade services. The negative population development in central regions with high relevance of trade services might therefore be explainable by a lack of positive agglomeration effects and the resulting lack in income and multiplier effects. In the case of activities related to trade, the question on the direction of causality is specifically pressing: Does a rather positive population development stabilise the

existence of trade activities, or do more trade activities cause a more positive population development?

Table 34: Indirect relations between factor "Trade service and food" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Trade service and food					
		Population development via joblessness			Population development via GDP and joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		0.042 (0.247)	0.318 ** (0.099)	0.578 * (0.269)	-0.260 ° (0.135)	-0.176 *** (0.047)	-0.061 (0.085)
Professional service	low	0.020 (0.331)	0.124 (0.139)	0.222 (0.315)	-0.309 ° (0.165)	-0.145 ** (0.052)	0.070 (0.111)
	high	0.064 (0.303)	0.512 ** (0.170)	0.934 * (0.433)	-0.212 ° (0.124)	-0.207 ** (0.066)	-0.192 (0.161)
Simple production	low	0.055 (0.275)	0.225 ° (0.133)	0.384 (0.300)	-0.206 ° (0.118)	-0.169 ** (0.053)	-0.116 (0.114)
	high	0.029 (0.370)	0.412 *** (0.123)	0.772 * (0.355)	-0.315 ° (0.173)	-0.183 *** (0.052)	-0.007 (0.104)
Primary and related production	low	0.047 (0.285)	0.360 ** (0.135)	0.654 ° (0.353)	-0.363 * (0.182)	-0.238 *** (0.064)	-0.070 (0.114)
	high	0.037 (0.354)	0.277 * (0.139)	0.503 ° (0.266)	-0.158 (0.116)	-0.113 * (0.047)	-0.052 (0.086)
Large scale production	low	-0.046 (0.284)	0.058 (0.114)	0.156 (0.307)	-0.112 (0.089)	-0.143 ** (0.046)	-0.175 (0.136)
	high	0.130 (0.289)	0.579 *** (0.136)	1.001 ** (0.384)	-0.408 * (0.201)	-0.209 *** (0.058)	0.053 (0.108)
Recreation service	low	0.245 (0.343)	0.349 * (0.147)	0.447 (0.355)	-0.189 (0.122)	-0.165 ** (0.055)	-0.129 (0.133)
	high	-0.161 (0.419)	0.287 ° (0.151)	0.710 ° (0.375)	-0.332 ° (0.186)	-0.186 ** (0.059)	0.006 (0.115)
Knowledge intensive production	low	0.493 ° (0.293)	0.249 * (0.121)	0.018 (0.307)	-0.133 (0.092)	-0.145 ** (0.047)	-0.153 (0.129)
	high	-0.409 (0.360)	0.388 ** (0.138)	1.139 * (0.482)	-0.388 ° (0.199)	-0.207 *** (0.059)	0.031 (0.140)
Health service	low	0.216 (0.292)	0.300 * (0.119)	0.378 (0.310)	-0.138 (0.097)	-0.108 ** (0.041)	-0.067 (0.107)
	high	-0.132 (0.345)	0.337 * (0.142)	0.779 * (0.361)	-0.383 ° (0.197)	-0.243 *** (0.067)	-0.056 (0.110)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

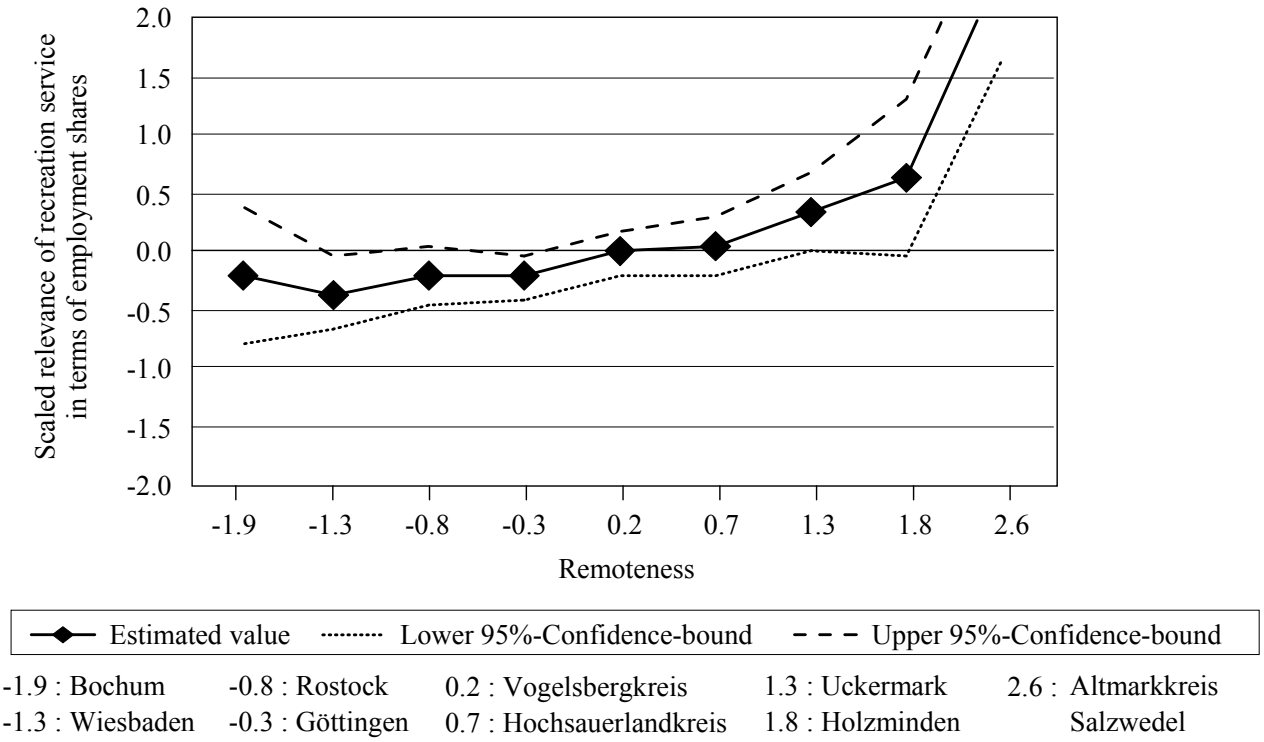
In summary, a regional focus on retail and food production activity is negatively related to many economic fundamentals, specifically to GDP per inhabitant and wages and thereby also to household income and tax revenues. Nevertheless, if complemented by other industries, trade services and food-related activities potentially contribute to lower unemployment specifically in remote districts. In districts of medium location a higher prevalence of trade activities is directly

positively related to population development. Accordingly, trade service and food related activities do not seem to introduce a positive dynamic themselves but they can complement other activities in the economy of non central regions with positive side effects for employment and population development.

4.6 Recreation service

Activities related to recreation services have a relatively high share in all employees in the most remote regions (Figure 7).

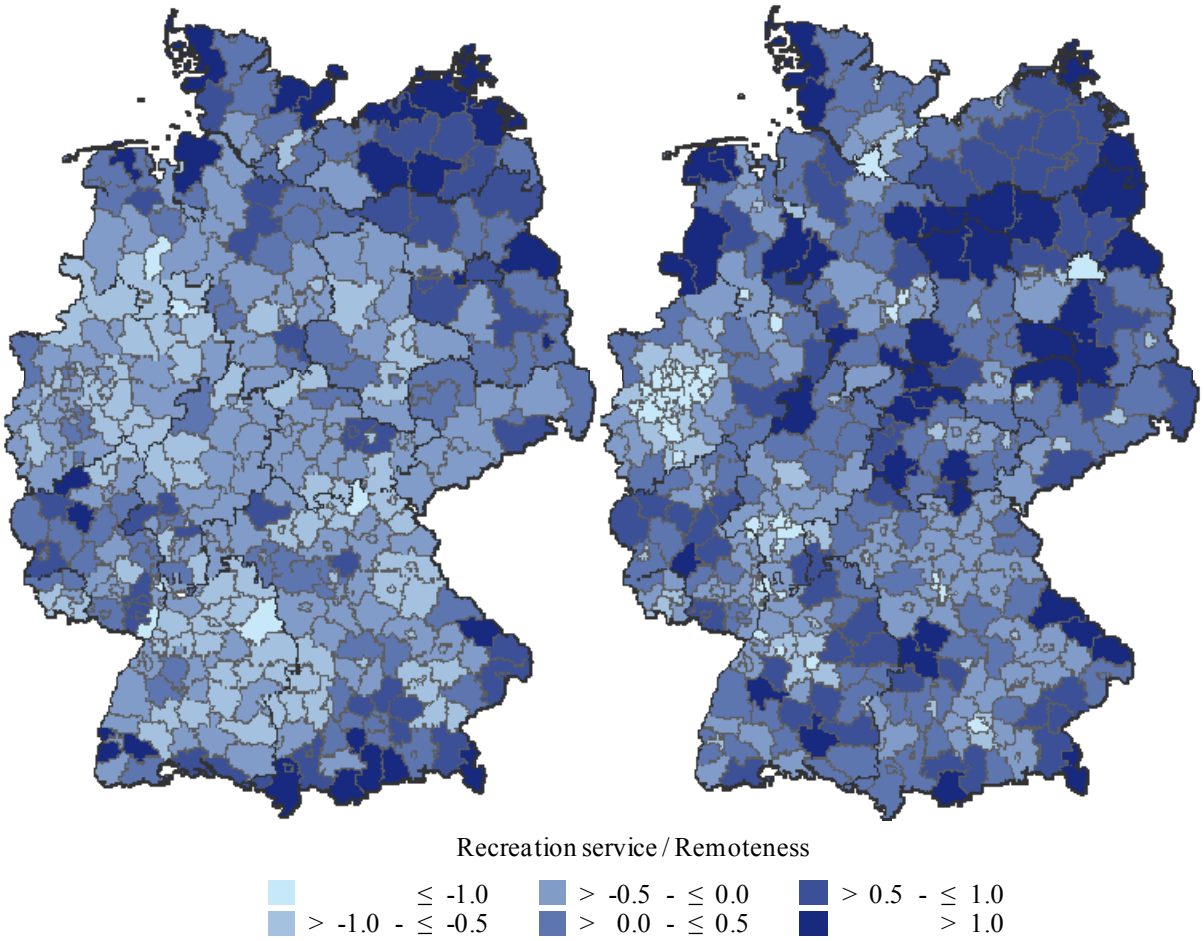
Figure 7: Industry response curve for "Recreation service" with respect to remoteness



Source: Own figure based on own calculations

Nevertheless, Map 13 shows that this relation is by no means a one-to-one relationship. Instead it is mainly caused by the high concentration of tourism and recreational activities in the north and very southern part of Germany. These regions encompass the coast and the Alps as popular tourist destinations.

Map 13: Geographical distribution of industrial factor "Recreation service" (left) as compared to remoteness (right) (NUTS 3)



Source: Own map based on own calculations; basis for the map: GfK GeoMarketing (2010).

A high relevance of recreation services is negatively related to regional productivity in terms of GDP per inhabitant and to wages in regions of central and medium location (Table 35). Nevertheless, it is positively related to wages in remote regions, specifically if accompanied by a relatively high share in simple or large scale production, respectively by a relatively low share of primary production and related activities. This might be interpreted in such a way that recreation services relate positively to wages where relevant occupational alternatives exist, i.e. where the industrial structure is rather diversified. Here, a high activity of hotels might for example also indicate export-orientation of local firms.

Table 35: Direct relations between factor "Recreation services" and GDP and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Recreation service					
		GDP direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-4.626 ** (1.687)	-1.723 ** (0.647)	1.180 (1.427)	-190.768 *** (40.028)	-56.094 *** (15.192)	78.579 * (32.723)
Professional service	low	-4.296 ° (2.355)	-1.070 (0.878)	2.157 (2.011)	-217.042 *** (55.375)	-74.146 *** (20.178)	68.750 (46.607)
	high	-4.957 * (2.479)	-2.376 ° (1.237)	0.204 (2.757)	-164.494 ** (57.204)	-38.042 (28.504)	88.409 (62.665)
Simple production	low	-5.610 *** (1.569)	-1.729 ° (0.887)	2.152 (1.337)	-132.862 *** (38.571)	-49.629 * (20.778)	33.604 (30.798)
	high	-3.642 (2.674)	-1.717 * (0.829)	0.208 (2.067)	-248.674 *** (61.636)	-62.560 ** (19.360)	123.555 ** (47.162)
Primary and related production	low	-4.758 * (2.088)	-1.293 (0.933)	2.172 (2.059)	-249.764 *** (51.141)	-66.230 ** (21.887)	117.303 * (47.496)
	high	-4.494 ° (2.655)	-2.153 * (1.017)	0.189 (1.394)	-131.772 * (61.139)	-45.958 ° (23.513)	39.856 (31.821)
Large scale production	low	0.006 (2.075)	-0.794 (0.862)	-1.594 (1.948)	-33.491 (47.648)	5.102 (19.918)	43.694 (44.627)
	high	-9.259 *** (2.430)	-2.652 ** (0.908)	3.955 * (1.979)	-348.045 *** (58.860)	-117.290 *** (21.265)	113.464 * (46.447)
Trade services and food	low	-3.224 (2.198)	-1.544 (1.011)	0.136 (1.997)	-158.590 ** (51.225)	-46.311 * (23.417)	65.968 (45.452)
	high	-6.028 ** (2.229)	-1.902 ** (0.673)	2.224 (1.847)	-222.946 *** (52.479)	-65.878 *** (15.752)	91.191 * (42.692)
Knowledge intensive production	low	-3.374 (2.095)	-1.558 (0.971)	0.257 (1.827)	-166.911 *** (48.647)	-41.573 ° (22.383)	83.764 * (41.879)
	high	-5.879 * (2.542)	-1.888 ** (0.726)	2.104 (2.374)	-214.625 *** (59.961)	-70.615 *** (16.953)	73.395 (54.866)
Health service	low	-5.147 * (2.240)	-1.952 * (0.864)	1.242 (1.747)	-175.737 *** (52.339)	-46.915 * (20.031)	81.908 * (40.024)
	high	-4.106 * (1.887)	-1.494 * (0.710)	1.119 (1.371)	-205.799 *** (44.472)	-65.274 *** (16.585)	75.251 * (31.559)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

While wages are positively related to tourism and recreation activities in remote regions and negatively in medium and central regions, joblessness relates negatively to recreation services in central and medium regions, but not so in remote locations (Table 36). Due to this positive economic effect, there is also an indirect positive relation to household income in regions of medium and central locations and to tax receipts in medium locations mediated by joblessness (Table 37).

Table 36: Direct and indirect relations between factor "Recreation services" and joblessness and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Recreation service					
		Joblessness direct			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-2.468 *** (0.726)	-0.973 *** (0.277)	0.523 (0.605)	53.783 ** (20.606)	12.252 ** (4.303)	-1.776 (3.336)
Professional service	low	-2.309 * (1.011)	-0.779 * (0.372)	0.750 (0.856)	50.314 * (25.261)	9.816 ° (5.106)	-2.550 (4.764)
	high	-2.627 * (1.052)	-1.166 * (0.525)	0.295 (1.163)	57.253 * (26.898)	14.688 * (7.271)	-1.003 (4.223)
Simple production	low	-1.951 ** (0.701)	-0.651 ° (0.384)	0.648 (0.568)	42.509 * (18.495)	8.201 (5.117)	-2.204 (3.789)
	high	-2.985 ** (1.131)	-1.294 *** (0.353)	0.397 (0.874)	65.058 * (29.370)	16.303 ** (5.568)	-1.348 (3.578)
Primary and related production	low	-2.815 ** (0.896)	-0.867 * (0.397)	1.082 (0.871)	61.353 * (24.671)	10.919 * (5.479)	-3.676 (6.193)
	high	-2.121 ° (1.127)	-1.079 * (0.432)	-0.037 (0.591)	46.214 ° (27.047)	13.585 * (6.114)	0.124 (2.016)
Large scale production	low	-2.036 * (0.877)	-1.194 ** (0.364)	-0.352 (0.825)	44.363 * (22.001)	15.038 ** (5.536)	1.197 (3.317)
	high	-2.900 ** (1.056)	-0.752 ° (0.392)	1.397 ° (0.840)	63.204 * (27.757)	9.466 ° (5.307)	-4.749 (7.584)
Trade services and food	low	-2.894 ** (0.939)	-1.040 * (0.431)	0.815 (0.843)	63.064 * (25.663)	13.095 * (6.065)	-2.769 (4.999)
	high	-2.042 * (0.953)	-0.906 ** (0.287)	0.231 (0.785)	44.503 ° (23.461)	11.409 ** (4.310)	-0.784 (2.909)
Knowledge intensive production	low	-2.138 * (0.887)	-0.895 * (0.412)	0.347 (0.774)	46.585 * (22.465)	11.275 * (5.684)	-1.180 (3.159)
	high	-2.798 * (1.102)	-1.050 *** (0.310)	0.698 (1.017)	60.982 * (28.302)	13.229 ** (4.758)	-2.372 (4.927)
Health service	low	-1.933 * (0.963)	-0.821 * (0.369)	0.291 (0.742)	42.130 ° (23.403)	10.340 * (5.107)	-0.990 (2.918)
	high	-3.003 *** (0.803)	-1.124 *** (0.302)	0.754 (0.579)	65.436 ** (23.762)	14.164 ** (4.792)	-2.562 (4.271)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Nevertheless, this positive indirect tax effect via reduced joblessness in non-remote regions is compensated in regions of medium location and more than compensated in central regions due to the indirect tax effect mediated by wages. According to these results the tax revenues in central regions characterised by recreational services might be relatively low due to the relatively low wages in these regions.

Table 37: Indirect relations between factor "Recreation services" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Recreation service					
		Tax via joblessness			Tax via wages		
		Central	Medium	Remote	Central	Medium	Remote
None		18.054 (11.452)	10.549 ** (3.541)	-7.512 (8.915)	-40.073 ** (15.334)	-9.663 ** (3.331)	10.567 (8.240)
Professional service	low	16.889 (12.033)	8.452 * (4.309)	-10.783 (12.633)	-45.593 * (18.659)	-12.773 ** (4.416)	9.245 (8.743)
	high	19.218 (13.264)	12.646 * (6.122)	-4.240 (16.761)	-34.554 * (16.330)	-6.553 (5.105)	11.888 (11.509)
Simple production	low	14.269 (9.517)	7.061 (4.345)	-9.322 (8.526)	-27.909 * (12.059)	-8.549 * (4.017)	4.519 (5.102)
	high	21.838 (14.801)	14.037 ** (4.570)	-5.702 (12.655)	-52.238 * (21.144)	-10.777 ** (4.050)	16.614 (12.658)
Primary and related production	low	20.595 (13.304)	9.401 * (4.616)	-15.548 (13.181)	-52.466 ** (19.932)	-11.409 * (4.487)	15.774 (12.205)
	high	15.513 (11.997)	11.697 * (5.123)	0.525 (8.491)	-27.681 ° (15.601)	-7.917 ° (4.388)	5.359 (5.549)
Large scale production	low	14.892 (10.546)	12.948 ** (4.575)	5.062 (11.937)	-7.035 (10.259)	0.879 (3.436)	5.876 (7.143)
	high	21.216 (14.207)	8.150 ° (4.491)	-20.085 (13.192)	-73.112 ** (26.462)	-20.205 *** (5.656)	15.257 (11.841)
Trade services and food	low	21.169 (13.738)	11.275 * (5.091)	-11.709 (12.506)	-33.314 * (15.147)	-7.978 ° (4.378)	8.871 (8.460)
	high	14.938 (10.911)	9.823 ** (3.569)	-3.314 (11.316)	-46.833 * (18.604)	-11.349 ** (3.636)	12.262 (9.916)
Knowledge intensive production	low	15.637 (10.925)	9.708 * (4.791)	-4.992 (11.209)	-35.062 * (15.176)	-7.162 ° (4.147)	11.264 (9.320)
	high	20.470 (14.048)	11.390 ** (3.925)	-10.031 (14.863)	-45.085 * (19.152)	-12.165 ** (3.906)	9.869 (9.838)
Health service	low	14.142 (10.622)	8.903 * (4.300)	-4.189 (10.730)	-36.916 * (16.138)	-8.082 * (3.857)	11.014 (9.039)
	high	21.965 (13.672)	12.195 ** (3.930)	-10.835 (8.806)	-43.231 ** (16.692)	-11.245 ** (3.730)	10.119 (7.907)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

On the other hand there is a positive direct relationship between tourism and recreation services and population development in regions in medium and specifically in remote locations (Table 38). This positive direct relationship may be interpreted as a hint as to the relevance of natural amenities and other factors positively related to quality of life, as well as to tourism, for population development specifically in peripheral regions. The positive relation between population development and recreational services in central regions is mediated by the relatively low unemployment in these regions.

Table 38: Direct and indirect relations between factor "Recreation services" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Recreation service					
		Population development direct			Population development via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.776 (0.624)	0.470 * (0.233)	1.715 *** (0.508)	1.140 ** (0.414)	0.437 *** (0.132)	-0.228 (0.269)
Professional service	low	-0.661 (0.868)	0.911 ** (0.317)	2.483 *** (0.714)	1.067 * (0.519)	0.350 * (0.171)	-0.327 (0.381)
	high	-0.891 (0.878)	0.029 (0.434)	0.948 (0.978)	1.214 * (0.550)	0.524 * (0.242)	-0.129 (0.508)
Simple production	low	0.136 (0.592)	0.781 * (0.316)	1.426 ** (0.490)	0.901 * (0.376)	0.292 ° (0.175)	-0.283 (0.256)
	high	-1.688 ° (0.949)	0.159 (0.296)	2.005 ** (0.717)	1.379 * (0.599)	0.581 *** (0.169)	-0.173 (0.383)
Primary and related production	low	-0.797 (0.815)	0.782 * (0.335)	2.360 ** (0.739)	1.301 ** (0.498)	0.389 * (0.183)	-0.471 (0.395)
	high	-0.754 (0.925)	0.158 (0.356)	1.070 * (0.486)	0.980 ◦ (0.561)	0.484 * (0.200)	0.016 (0.257)
Large scale production	low	0.259 (0.726)	0.397 (0.304)	0.534 (0.686)	0.941 * (0.452)	0.536 ** (0.173)	0.153 (0.361)
	high	-1.811 ° (0.937)	0.543 (0.332)	2.896 *** (0.722)	1.340 * (0.565)	0.337 ° (0.179)	-0.609 (0.392)
Trade services and food	low	-0.579 (0.783)	0.609 ° (0.357)	1.796 * (0.700)	1.337 * (0.519)	0.467 * (0.199)	-0.355 (0.376)
	high	-0.973 (0.809)	0.331 (0.243)	1.634 * (0.650)	0.944 ° (0.484)	0.407 ** (0.135)	-0.100 (0.343)
Knowledge intensive production	low	0.121 (0.752)	0.498 (0.339)	0.874 (0.643)	0.988 * (0.461)	0.402 * (0.189)	-0.151 (0.339)
	high	-1.673 ° (0.931)	0.442 ° (0.265)	2.556 ** (0.836)	1.293 * (0.579)	0.472 ** (0.147)	-0.304 (0.449)
Health service	low	-0.705 (0.800)	0.444 (0.304)	1.594 ** (0.614)	0.893 ° (0.484)	0.369 * (0.170)	-0.127 (0.325)
	high	-0.846 (0.702)	0.495 ° (0.258)	1.837 *** (0.495)	1.387 ** (0.474)	0.505 *** (0.145)	-0.329 (0.263)

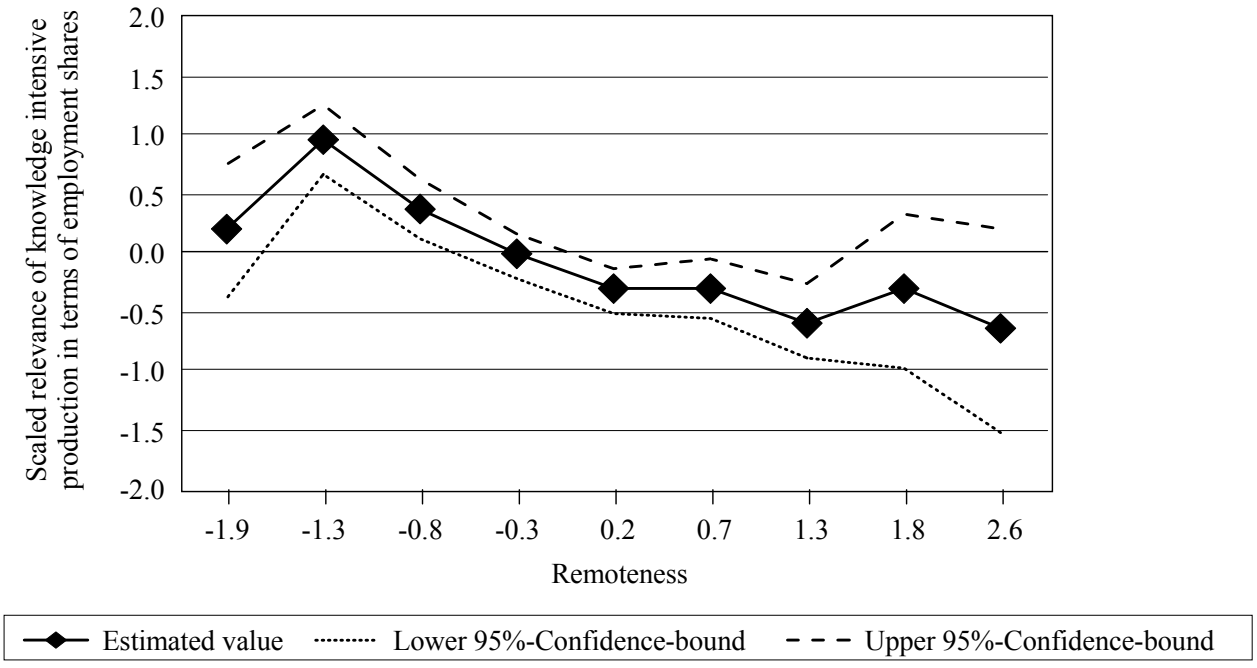
Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, only in peripheral regions does recreational service represents an option for contributing to higher regional productivity if measured by wages. On the other hand it relates to relatively low joblessness in central and medium locations and thereby contributes positively to the household income situation there. Tourism and recreation is positively related to population development but due to different underlying causes: better occupational opportunities in rather central regions and other un-measured amenities related to tourism in rather peripheral regions.

4.7 Knowledge-intensive production

Knowledge-intensive production is not specifically highly concentrated in metropolises but rather in other locations of relatively high centrality (Figure 8).

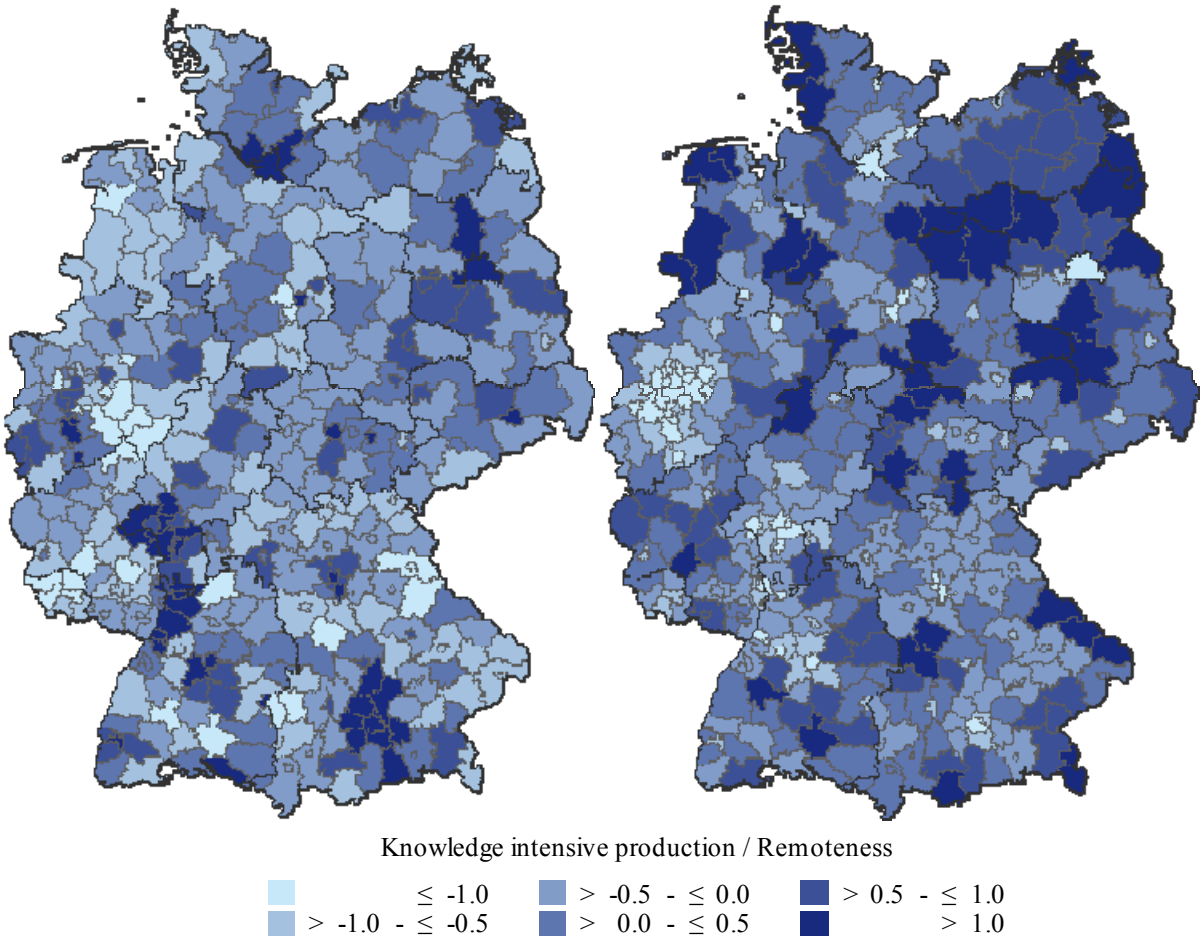
Figure 8: Industry response curve for knowledge-intensive production with respect to remoteness



Source: Own figure based on own calculations

Map 14 supports this impression in so far as there is a high relevance of knowledge- intensive industries in many metropolises (Hamburg in the north, Munich in the south, Berlin in the east, Frankfurt in the west), but their share is at least as high or even higher in the surrounding regions.

Map 14: Geographical distribution of industrial factor "Knowledge intensive production" (left) as compared to remoteness (right) (NUTS 3)



Source: Own maps; basis for the map: GfK GeoMarketing (2010).

There is a significant positive relationship between a high share of knowledge-intensive activities and regional productivity as indicated by GDP per inhabitant and wages in regions of medium and peripheral location (Table 39). The positive relation to GDP per inhabitant is specifically strong in remote regions with a complementary high share of professional services and large scale production.

Table 39: Direct relations between factor "Knowledge intensive production" and GDP and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		GDP direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		-2.168 (1.686)	1.608 ** (0.491)	5.383 ** (1.688)	28.834 (38.507)	67.961 *** (11.436)	107.088 ** (38.897)
Professional service	low	0.085 (1.837)	-0.451 (0.748)	-0.986 (2.168)	-15.834 (41.794)	61.683 *** (17.177)	139.200 ** (49.470)
	high	-4.420 * (1.811)	3.666 *** (0.986)	11.752 *** (2.665)	73.502 ° (41.791)	74.239 ** (22.883)	74.976 (62.284)
Simple production	low	-1.610 (1.673)	2.578 *** (0.761)	6.766 ** (2.074)	38.986 (38.330)	67.453 *** (17.647)	95.920 * (47.872)
	high	-2.726 (2.249)	0.637 (0.647)	4.000 * (2.000)	18.682 (51.225)	68.469 *** (14.832)	118.256 ** (45.753)
Primary and related production	low	-1.803 (1.506)	2.160 ** (0.742)	6.124 * (2.493)	16.315 (34.308)	81.484 *** (17.225)	146.654 * (57.341)
	high	-2.532 (2.412)	1.055 (0.999)	4.642 * (2.028)	41.353 (55.164)	54.438 * (22.821)	67.522 (46.506)
Large scale production	low	0.187 (1.653)	1.330 * (0.641)	2.473 (1.995)	-23.730 (37.680)	50.012 *** (14.795)	123.755 ** (45.472)
	high	-4.522 * (1.916)	1.885 ** (0.609)	8.293 *** (1.992)	81.398 ° (43.956)	85.910 *** (14.166)	90.421 ° (46.429)
Trade services and food	low	0.389 (1.766)	2.158 ** (0.672)	3.926 ° (2.060)	1.960 (40.540)	50.516 ** (15.578)	99.071 * (47.181)
	high	-4.724 * (2.118)	1.058 ° (0.639)	6.839 ** (2.405)	55.708 (48.457)	85.407 *** (14.741)	115.106 * (55.479)
Recreation service	low	-0.883 (1.982)	1.776 * (0.845)	4.436 ° (2.284)	53.311 (45.633)	82.859 *** (19.394)	112.408 * (52.626)
	high	-3.453 (2.681)	1.439 * (0.658)	6.330 ** (2.375)	4.357 (61.529)	53.063 *** (15.149)	101.769 ° (54.928)
Health service	low	0.729 (1.771)	2.584 *** (0.565)	4.439 * (1.981)	4.996 (40.299)	58.686 *** (13.292)	112.375 * (45.388)
	high	-5.064 ** (1.815)	0.631 (0.700)	6.327 ** (2.126)	52.672 (41.884)	77.237 *** (16.234)	101.801 * (48.959)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The higher GDP per inhabitant also contributes to a lower joblessness (Table 40) and there is also a slight direct negative relation between knowledge-intensive activities and unemployment.

Table 40: Direct and indirect relations between factor "Knowledge-intensive production" and joblessness conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Joblessness direct			Joblessness via GDP		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.729 (0.713)	-0.541 * (0.210)	-0.352 (0.722)	0.233 (0.205)	-0.202 ** (0.073)	-0.776 ° (0.426)
Professional service	low	-0.630 (0.775)	-0.738 * (0.317)	-0.847 (0.917)	-0.009 (0.197)	0.057 (0.095)	0.142 (0.319)
	high	-0.829 (0.771)	-0.343 (0.424)	0.142 (1.156)	0.474 ° (0.276)	-0.461 ** (0.154)	-1.694 * (0.855)
Simple production	low	-1.279 ° (0.707)	-0.606 ° (0.326)	0.068 (0.888)	0.173 (0.193)	-0.324 ** (0.115)	-0.975 ° (0.532)
	high	-0.179 (0.951)	-0.476 ° (0.274)	-0.772 (0.848)	0.293 (0.270)	-0.080 (0.083)	-0.577 (0.388)
Primary and related production	low	0.024 (0.637)	-0.853 ** (0.317)	-1.730 (1.061)	0.194 (0.180)	-0.272 * (0.107)	-0.883 (0.536)
	high	-1.482 (1.019)	-0.228 (0.422)	1.026 (0.862)	0.272 (0.282)	-0.133 (0.128)	-0.669 (0.420)
Large scale production	low	-0.863 (0.698)	-0.504 ° (0.273)	-0.146 (0.844)	-0.020 (0.178)	-0.167 ° (0.087)	-0.356 (0.329)
	high	-0.595 (0.815)	-0.577 * (0.261)	-0.559 (0.861)	0.485 ° (0.287)	-0.237 ** (0.090)	-1.195 ° (0.610)
Trade services and food	low	-1.701 * (0.745)	-0.386 (0.288)	0.929 (0.875)	-0.042 (0.190)	-0.271 ** (0.100)	-0.566 (0.391)
	high	0.243 (0.900)	-0.695 * (0.271)	-1.633 (1.027)	0.507 (0.309)	-0.133 (0.084)	-0.986 ° (0.564)
Recreation service	low	-0.390 (0.844)	-0.461 (0.359)	-0.532 (0.976)	0.095 (0.216)	-0.223 ° (0.115)	-0.639 (0.438)
	high	-1.068 (1.141)	-0.620 * (0.279)	-0.172 (1.020)	0.371 (0.326)	-0.181 * (0.090)	-0.913 ° (0.535)
Health service	low	-0.373 (0.748)	-0.230 (0.247)	-0.087 (0.842)	-0.078 (0.193)	-0.325 *** (0.096)	-0.640 (0.406)
	high	-1.085 (0.774)	-0.852 ** (0.298)	-0.618 (0.909)	0.544 ° (0.297)	-0.079 (0.089)	-0.912 ° (0.513)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

There is a positive direct relationship of knowledge-intensive activities in a region and household income, and this relationship is amplified via the positive relation to GDP (Table 41) and the negative relation to unemployment (Table 42).

Table 41: Direct and indirect relations between factor "Knowledge intensive production" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Household income direct			Household income via GDP		
		Central	Medium	Remote	Central	Medium	Remote
None		8.550 (35.549)	27.971 * (11.112)	47.393 (36.616)	-12.418 (11.114)	6.078 * (3.049)	9.864 (21.938)
Professional service	low	9.164 (38.443)	-3.479 (16.115)	-16.122 (46.090)	0.487 (10.528)	-1.703 (2.907)	-1.807 (5.623)
	high	7.935 (38.902)	59.422 ** (21.413)	110.908 ° (58.015)	-25.324 ° (15.270)	13.859 * (6.656)	21.534 (47.666)
Simple production	low	-4.168 (35.528)	46.302 ** (16.721)	96.772 * (45.149)	-9.221 (10.416)	9.747 * (4.829)	12.398 (27.561)
	high	21.268 (47.137)	9.641 (14.039)	-1.986 (42.548)	-15.616 (14.620)	2.409 (2.628)	7.330 (16.550)
Primary and related production	low	44.220 (31.747)	23.217 (16.380)	2.214 (53.587)	-10.331 (9.765)	8.167 ° (4.292)	11.221 (25.126)
	high	-27.121 (50.809)	32.725 (21.199)	92.572 * (43.215)	-14.506 (15.234)	3.989 (4.099)	8.506 (19.095)
Large scale production	low	-45.452 (34.733)	-3.124 (13.994)	39.205 (42.755)	1.070 (9.484)	5.028 (3.143)	4.532 (10.626)
	high	62.551 (40.760)	59.066 *** (13.682)	55.581 (43.221)	-25.907 (15.870)	7.128 ° (3.653)	15.196 (33.658)
Trade services and food	low	-7.013 (37.297)	14.375 (14.611)	35.763 (43.869)	2.228 (10.166)	8.157 * (4.122)	7.195 (16.285)
	high	24.112 (44.855)	41.567 ** (14.233)	59.023 (51.839)	-27.065 (17.047)	3.999 (2.891)	12.533 (27.945)
Recreation service	low	-136.259 ** (42.118)	-6.869 (18.345)	122.521 * (49.058)	-5.057 (11.576)	6.716 (4.166)	8.128 (18.379)
	high	153.358 ** (56.658)	62.812 *** (14.224)	-27.735 (51.074)	-19.780 (17.677)	5.440 (3.298)	11.600 (25.909)
Health service	low	-3.090 (37.180)	3.332 (12.651)	9.754 (42.563)	4.176 (10.313)	9.768 * (4.434)	8.133 (18.273)
	high	20.189 (38.688)	52.610 *** (15.439)	85.032 ° (45.609)	-29.013 ° (16.519)	2.387 (2.811)	11.594 (25.824)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

All of these relations to unemployment and household income are mainly significant for regions of medium location, which underscores the specific relevance of knowledge intensive activities for this type of region. The direct positive relation to household income is specifically important in regions with a high share of professional services, large scale production or recreational or health services. This implies again the relevance of an industry mix that contributes to positive multiplier and income effects which in turn support the availability of additional income opportunities.

Table 42: Further indirect relations between factor "Knowledge-intensive production" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Household income via joblessness			Household income via GDP and joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		15.888 (16.023)	6.810 * (2.996)	1.197 (3.026)	-5.070 (4.633)	2.546 * (1.063)	2.637 (4.162)
Professional service	low	13.718 (17.229)	9.297 * (4.423)	2.878 (5.278)	0.199 (4.298)	-0.714 (1.201)	-0.483 (1.299)
	high	18.057 (17.376)	4.322 (5.416)	-0.484 (3.993)	-10.339 (6.520)	5.806 * (2.274)	5.758 (9.000)
Simple production	low	27.883 ° (16.854)	7.630 ° (4.398)	-0.231 (3.037)	-3.765 (4.309)	4.083 * (1.675)	3.315 (5.227)
	high	3.892 (20.745)	5.989 (3.662)	2.625 (4.838)	-6.375 (6.084)	1.009 (1.064)	1.960 (3.186)
Primary and related production	low	-0.523 (13.883)	10.745 * (4.560)	5.881 (9.418)	-4.218 (4.062)	3.421 * (1.526)	3.000 (4.798)
	high	32.298 (23.582)	2.874 (5.353)	-3.486 (5.932)	-5.922 (6.315)	1.671 (1.653)	2.274 (3.655)
Large scale production	low	18.800 (15.888)	6.352 ° (3.676)	0.496 (2.962)	0.437 (3.873)	2.106 ° (1.180)	1.212 (2.113)
	high	12.975 (18.035)	7.267 * (3.616)	1.898 (4.056)	-10.577 (6.767)	2.986 * (1.286)	4.063 (6.359)
Trade services and food	low	37.064 * (18.620)	4.861 (3.762)	-3.157 (5.537)	0.909 (4.154)	3.417 * (1.442)	1.924 (3.142)
	high	-5.289 (19.647)	8.758 * (3.864)	5.552 (8.924)	-11.049 (7.253)	1.675 (1.118)	3.351 (5.315)
Recreation service	low	8.502 (18.517)	5.808 (4.674)	1.808 (4.263)	-2.064 (4.741)	2.813 ° (1.560)	2.173 (3.543)
	high	23.273 (25.516)	7.812 * (3.870)	0.586 (3.573)	-8.075 (7.370)	2.279 ° (1.228)	3.102 (4.936)
Health service	low	8.125 (16.412)	2.894 (3.162)	0.294 (2.896)	1.705 (4.222)	4.092 ** (1.469)	2.175 (3.501)
	high	23.650 (17.849)	10.726 * (4.350)	2.100 (4.381)	-11.845 ° (7.090)	1.000 (1.144)	3.100 (4.906)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Regional tax revenues are directly positively affected by knowledge-intensive activities in regions in medium and peripheral locations (Table 43), nevertheless, this holds specifically true for districts with a low relevance of other productive activities.

Table 43: Direct and indirect relations between factor "Knowledge-intensive production" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Tax direct			Tax via GDP		
		Central	Medium	Remote	Central	Medium	Remote
None		-7.782 (25.715)	27.954 *** (8.147)	63.689 * (26.704)	-17.123 (13.913)	13.435 ** (4.466)	47.451 * (21.640)
Professional service	low	-0.222 (27.767)	11.951 (11.652)	24.123 (33.306)	0.671 (14.514)	-3.765 (6.267)	-8.692 (19.328)
	high	-15.342 (28.222)	43.957 ** (15.809)	103.255 * (42.761)	-34.918 * (16.486)	30.636 *** (9.166)	103.595 * (41.576)
Simple production	low	-8.329 (25.682)	45.632 *** (12.327)	99.593 ** (33.130)	-12.714 (13.547)	21.546 ** (6.958)	59.641 * (26.914)
	high	-7.234 (34.096)	10.275 (10.146)	27.785 (30.789)	-21.532 (18.470)	5.325 (5.453)	35.261 ° (21.146)
Primary and related production	low	22.252 (23.089)	43.770 *** (11.864)	65.289 ° (38.785)	-14.245 (12.359)	18.053 ** (6.636)	53.981 ° (28.331)
	high	-37.815 (36.716)	12.137 (15.449)	62.089 * (31.654)	-20.002 (19.620)	8.817 (8.433)	40.921 ° (22.435)
Large scale production	low	-7.385 (25.150)	41.069 *** (10.158)	89.523 ** (30.947)	1.476 (13.065)	11.115 * (5.554)	21.800 (19.007)
	high	-8.178 (29.727)	14.839 (10.163)	37.856 (31.696)	-35.723 * (17.299)	15.756 ** (5.494)	73.103 * (29.908)
Trade services and food	low	-48.187 ° (26.942)	38.896 *** (10.568)	125.979 *** (31.712)	3.072 (13.971)	18.031 ** (6.094)	34.611 (21.472)
	high	32.624 (32.572)	17.011 (10.531)	1.399 (38.083)	-37.318 * (18.881)	8.839 (5.461)	60.292 * (29.123)
Recreation service	low	5.503 (30.884)	18.097 (13.375)	30.690 (35.792)	-6.973 (15.746)	14.846 * (7.327)	39.100 (23.937)
	high	-21.067 (41.548)	37.811 *** (10.541)	96.688 ** (37.161)	-27.274 (22.124)	12.024 * (5.721)	55.803 * (27.924)
Health service	low	-0.149 (26.912)	40.325 *** (9.162)	80.799 ** (30.899)	5.758 (14.055)	21.593 *** (5.503)	39.127 ° (21.743)
	high	-15.415 (27.970)	15.582 (11.387)	46.579 (33.269)	-40.004 * (17.135)	5.278 (5.890)	55.776 * (26.315)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The positive relation of knowledge intensive production on GDP and wages in regions in medium and remote locations carries through to a positive indirect relation to tax revenues as well (Tables 43 and 44).

Table 44: Further indirect relations between factor "Knowledge-intensive production" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Tax via wages			Tax via GDP and wages		
		Central	Medium	Remote	Central	Medium	Remote
None		6.057 (8.318)	11.707 *** (3.180)	14.400 (10.840)	-1.423 (1.672)	3.759 ** (1.452)	17.386 (12.969)
Professional service	low	-3.326 (8.844)	10.626 ** (3.727)	18.718 (14.020)	0.056 (1.207)	-1.053 (1.766)	-3.185 (7.327)
	high	15.440 (10.074)	12.789 ** (4.793)	10.082 (10.693)	-2.902 (2.819)	8.571 ** (3.068)	37.956 (27.095)
Simple production	low	8.190 (8.468)	11.620 ** (3.922)	12.898 (10.666)	-1.057 (1.440)	6.028 ** (2.279)	21.852 (16.238)
	high	3.924 (10.834)	11.795 ** (3.585)	15.902 (12.157)	-1.790 (2.160)	1.490 (1.553)	12.919 (10.872)
Primary and related production	low	3.427 (7.290)	14.037 *** (4.215)	19.720 (15.117)	-1.184 (1.437)	5.051 * (2.105)	19.778 (15.623)
	high	8.687 (11.917)	9.378 * (4.411)	9.080 (8.657)	-1.663 (2.157)	2.467 (2.408)	14.993 (12.079)
Large scale production	low	-4.985 (8.074)	8.615 ** (3.142)	16.641 (12.561)	0.123 (1.091)	3.109 ° (1.670)	7.987 (8.410)
	high	17.099 (10.733)	14.799 *** (3.990)	12.159 (10.161)	-2.969 (2.902)	4.408 * (1.764)	26.784 (19.238)
Trade services and food	low	0.412 (8.517)	8.702 ** (3.263)	13.322 (10.835)	0.255 (1.181)	5.044 * (1.972)	12.681 (10.860)
	high	11.702 (10.846)	14.713 *** (4.036)	15.478 (12.641)	-3.102 (3.065)	2.473 (1.603)	22.090 (16.850)
Recreation service	low	11.199 (10.234)	14.274 ** (4.520)	15.115 (12.223)	-0.580 (1.398)	4.153 ° (2.206)	14.326 (12.184)
	high	0.915 (12.928)	9.141 ** (3.257)	13.685 (11.661)	-2.267 (2.662)	3.364 ° (1.732)	20.445 (15.823)
Health service	low	1.050 (8.472)	10.110 ** (3.145)	15.111 (11.684)	0.479 (1.237)	6.041 ** (1.944)	14.336 (11.623)
	high	11.064 (9.484)	13.305 *** (3.984)	13.689 (11.172)	-3.325 (3.161)	1.476 (1.673)	20.435 (15.443)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

While there is no significant and strong direct relationship between population development and knowledge-intensive activities, there is a positive relationship in medium locations that is due to the positive relation to GDP and joblessness (Table 45).

Table 45: Indirect relations between factor "Knowledge-intensive production" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Knowledge intensive production					
		Population development via joblessness			Population development via GDP and joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		0.337 (0.337)	0.243 * (0.098)	0.154 (0.317)	-0.107 (0.097)	0.091 ** (0.034)	0.338 ° (0.201)
Professional service	low	0.291 (0.364)	0.331 * (0.146)	0.369 (0.409)	0.004 (0.091)	-0.025 (0.043)	-0.062 (0.140)
	high	0.383 (0.365)	0.154 (0.191)	-0.062 (0.504)	-0.219 (0.136)	0.207 ** (0.072)	0.738 ° (0.409)
Simple production	low	0.591 ° (0.350)	0.272 ° (0.149)	-0.030 (0.387)	-0.080 (0.091)	0.146 ** (0.054)	0.425 ° (0.251)
	high	0.083 (0.440)	0.213 ° (0.125)	0.337 (0.378)	-0.135 (0.128)	0.036 (0.037)	0.251 (0.179)
Primary and related production	low	-0.011 (0.294)	0.383 ** (0.147)	0.754 (0.493)	-0.089 (0.085)	0.122 * (0.050)	0.385 (0.250)
	high	0.685 (0.493)	0.102 (0.190)	-0.447 (0.389)	-0.126 (0.133)	0.060 (0.058)	0.292 (0.195)
Large scale production	low	0.399 (0.333)	0.226 ° (0.125)	0.064 (0.368)	0.009 (0.082)	0.075 ° (0.040)	0.155 (0.148)
	high	0.275 (0.381)	0.259 * (0.120)	0.243 (0.379)	-0.224 (0.141)	0.106 * (0.042)	0.521 ° (0.291)
Trade services and food	low	0.786 * (0.383)	0.173 (0.130)	-0.405 (0.392)	0.019 (0.088)	0.122 ** (0.047)	0.247 (0.180)
	high	-0.112 (0.416)	0.312 * (0.126)	0.712 (0.476)	-0.234 (0.151)	0.060 (0.038)	0.430 (0.265)
Recreation service	low	0.180 (0.392)	0.207 (0.162)	0.232 (0.429)	-0.044 (0.100)	0.100 ° (0.053)	0.279 (0.201)
	high	0.493 (0.538)	0.278 * (0.129)	0.075 (0.445)	-0.171 (0.155)	0.081 * (0.041)	0.398 (0.250)
Health service	low	0.172 (0.347)	0.103 (0.111)	0.038 (0.367)	0.036 (0.089)	0.146 ** (0.045)	0.279 (0.188)
	high	0.501 (0.373)	0.382 ** (0.139)	0.269 (0.401)	-0.251 ° (0.147)	0.036 (0.040)	0.398 (0.241)

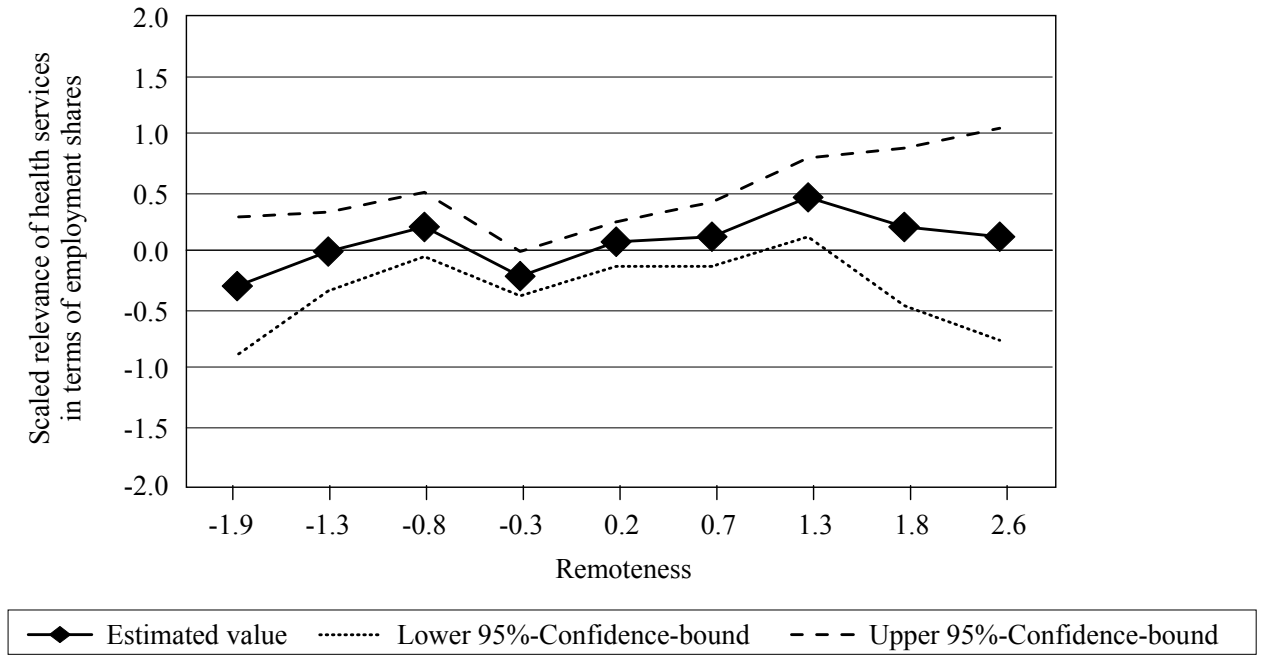
Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, knowledge intensive activities are important for medium and remote regions in terms of regional productivity and tax revenues. In remote regions, the positive relation to GDP per inhabitant is conditional on the relative importance of other economic activities, specifically professional services and large scale production. In terms of income distribution, they are mainly of relevance for regions in medium locations; here, they go along with a lower unemployment and with a higher household income and are also positively related to population development mediated by the positive economic effects.

4.8 Health service

Like the industrial factor "Large scale production", health services do not show an evident relation to remoteness (Figure 9).

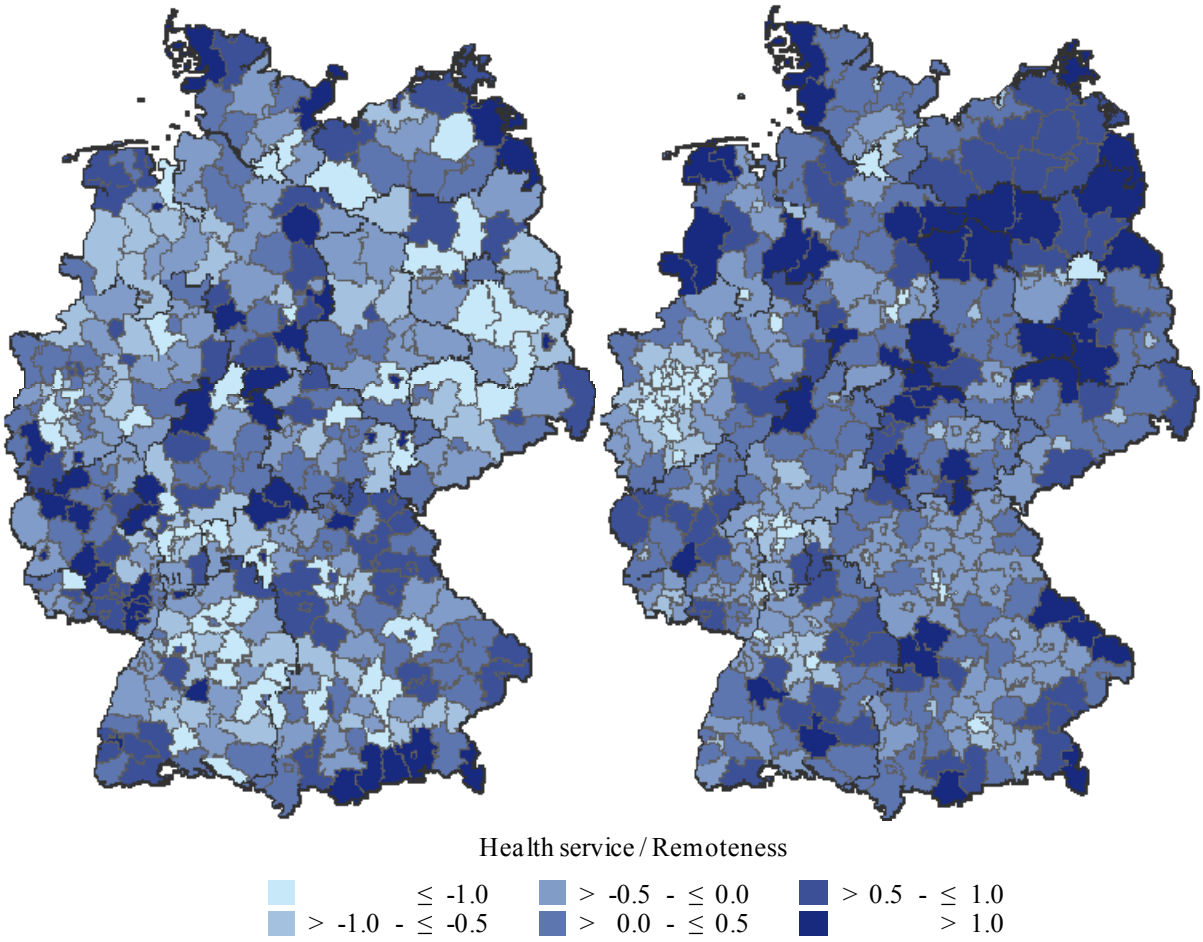
Figure 9: Industry response curve for Health services with respect to population density



Source: Own figure based on own calculations

Map 15 gives the impression that concentrations of health services are scattered rather randomly in space. As health care is an industry that needs to be provided at least in its basic services everywhere, it might partly represent a residual activity like other public services or primary production in peripheral areas.

Map 15: Geographical distribution of industrial factor "Health services" (left) as compared to remoteness (right) (NUTS 3)



Source: Own maps; basis for the map: GfK GeoMarketing (2010).

A high concentration of health industry shows no significant and strong relationship to regional productivity as measured by GDP per inhabitant (see appendix). Nevertheless, it is positively related to unemployment in medium and peripheral locations and negatively to wages in central and medium locations (Table 46).

Table 46: Direct relationship between factor "Health service" and joblessness and wages conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Health service					
		Joblessness direct			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote
None		0.536 (0.502)	0.790 *** (0.190)	1.044 * (0.526)	-61.280 * (27.114)	-20.122 ° (10.502)	21.037 (28.645)
Professional service	low	0.969 (0.618)	0.716 ** (0.245)	0.464 (0.711)	-106.869 ** (33.588)	-28.028 * (13.338)	50.813 (38.513)
	high	0.103 (0.593)	0.863 * (0.387)	1.623 ° (0.941)	-15.691 (31.967)	-12.215 (21.086)	-8.740 (50.950)
Simple production	low	-0.160 (0.536)	0.918 ** (0.300)	1.997 ** (0.662)	-60.438 * (28.904)	-11.993 (16.520)	36.451 (36.240)
	high	1.231 ° (0.735)	0.661 *** (0.200)	0.091 (0.684)	-62.122 (39.824)	-28.250 ** (10.906)	5.622 (36.931)
Primary and related production	low	0.978 * (0.465)	1.107 *** (0.269)	1.236 (0.766)	-142.790 *** (25.614)	-50.472 *** (14.811)	41.846 (41.807)
	high	0.094 (0.825)	0.473 (0.318)	0.852 (0.647)	20.230 (44.486)	10.229 (17.247)	0.228 (34.902)
Large scale production	low	0.462 (0.597)	0.672 ** (0.249)	0.883 (0.659)	-71.179 * (32.241)	-6.866 (13.554)	57.447 (35.761)
	high	0.609 (0.635)	0.907 *** (0.240)	1.205 ° (0.680)	-51.381 (34.247)	-33.377 * (13.241)	-15.374 (36.870)
Trade services and food	low	0.148 (0.710)	0.832 ** (0.316)	1.516 * (0.738)	-57.490 (38.244)	-11.215 (17.319)	35.060 (40.270)
	high	0.923 (0.626)	0.747 *** (0.219)	0.572 (0.663)	-65.070 ° (33.855)	-29.028 * (11.998)	7.014 (35.759)
Recreation service	low	1.102 (0.689)	0.951 ** (0.291)	0.799 (0.653)	-45.357 (37.281)	-10.397 (15.975)	24.563 (35.523)
	high	-0.031 (0.783)	0.629 * (0.264)	1.289 * (0.549)	-77.203 ° (42.165)	-29.846 * (14.365)	17.511 (29.852)
Knowledge intensive production	low	0.903 (0.558)	1.111 *** (0.289)	1.318 ° (0.718)	-85.892 ** (30.218)	-29.699 ° (15.861)	26.495 (38.926)
	high	0.168 (0.586)	0.469 * (0.232)	0.769 (0.750)	-36.668 (31.579)	-10.545 (12.627)	15.578 (40.637)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

A high concentration of health-related activities also goes along with a relatively low household income (Table 47), relatively low tax receipts (Table 48), and with a rather negative population development (Table 49).

Table 47: Direct and indirect relations between factor "Health service" and household income conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Health service					
		Household income direct			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-33.875 (25.128)	-26.483 ** (9.731)	-19.091 (26.357)	-11.675 (11.315)	-9.947 ** (3.147)	-3.548 (5.545)
Professional service	low	2.376 (31.403)	-10.421 (12.348)	-23.219 (35.524)	-21.106 (14.433)	-9.023 * (3.600)	-1.578 (3.361)
	high	-70.127 * (29.401)	-42.545 * (19.419)	-14.964 (46.892)	-2.243 (12.934)	-10.871 * (5.367)	-5.517 (8.767)
Simple production	low	-8.476 (26.766)	-33.821 * (15.275)	-59.165 ° (33.408)	3.479 (11.723)	-11.569 ** (4.472)	-6.786 (10.289)
	high	-59.275 (36.749)	-19.146 ° (10.118)	20.982 (33.974)	-26.828 (17.316)	-8.326 ** (3.042)	-0.309 (2.369)
Primary and related production	low	-31.978 (25.099)	-48.073 *** (13.868)	-64.169 ° (38.633)	-21.306 ° (11.412)	-13.940 ** (4.437)	-4.200 (6.738)
	high	-35.773 (41.023)	-4.893 (15.871)	25.986 (32.325)	-2.044 (17.982)	-5.955 (4.192)	-2.895 (4.814)
Large scale production	low	-17.384 (29.856)	-19.209 (12.499)	-21.034 (33.003)	-10.072 (13.250)	-8.470 * (3.585)	-3.001 (4.973)
	high	-50.366 (31.610)	-33.758 ** (12.291)	-17.149 (33.908)	-13.277 (14.218)	-11.424 ** (3.834)	-4.095 (6.484)
Trade services and food	low	-33.196 (35.269)	-27.350 ° (15.969)	-21.503 (37.121)	-3.235 (15.492)	-10.481 * (4.530)	-5.152 (8.025)
	high	-34.554 (31.363)	-25.617 * (11.125)	-16.680 (32.913)	-20.114 (14.512)	-9.413 ** (3.375)	-1.943 (3.653)
Recreation service	low	-98.624 ** (34.345)	-51.430 *** (14.701)	-4.237 (32.693)	-24.019 (16.130)	-11.972 ** (4.422)	-2.715 (4.589)
	high	30.874 (39.023)	-1.536 (13.329)	-33.946 (27.461)	0.669 (17.062)	-7.922 * (3.708)	-4.380 (6.744)
Knowledge intensive production	low	-45.893 (28.102)	-51.923 *** (14.679)	-57.953 (35.820)	-19.689 (13.094)	-13.991 ** (4.639)	-4.480 (7.063)
	high	-21.858 (29.118)	-1.044 (11.635)	19.770 (37.370)	-3.660 (12.806)	-5.904 ° (3.159)	-2.615 (4.635)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The negative relation between a high relevance of health services and household income is specifically relevant in districts with a lack of complementing activities, i.e., with a low relevance of other industrial factors. Again, this seems to underscore the characterisation of health service as a residual activity that does not contribute by itself to a dynamic regional development but relies on positive income and multiplier effects generated by other activities.

Table 48: Direct and indirect relations between factor "Health service" and tax revenues conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Health service					
		Tax direct			Tax via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		-35.787 * (18.211)	-14.259 * (7.099)	7.269 (19.076)	-3.919 (4.284)	-8.565 *** (2.561)	-15.004 ° (8.538)
Professional service	low	-40.729 ° (22.688)	-35.071 *** (9.028)	-29.413 (25.759)	-7.085 (6.025)	-7.769 ** (2.994)	-6.673 (10.378)
	high	-30.845 (21.511)	6.553 (14.163)	43.950 (33.871)	-0.753 (4.358)	-9.360 * (4.519)	-23.334 (14.869)
Simple production	low	-32.985 ° (19.490)	7.821 (11.112)	48.628 * (24.445)	1.168 (3.979)	-9.961 ** (3.710)	-28.701 * (12.166)
	high	-38.588 (26.648)	-36.340 *** (7.345)	-34.091 (24.580)	-9.006 (7.383)	-7.168 ** (2.513)	-1.306 (9.839)
Primary and related production	low	-41.648 * (18.188)	-15.158 (10.238)	11.332 (28.177)	-7.152 (5.268)	-12.002 *** (3.614)	-17.764 (11.974)
	high	-29.925 (29.668)	-13.360 (11.501)	3.206 (23.392)	-0.686 (6.046)	-5.127 (3.570)	-12.243 (9.841)
Large scale production	low	-30.562 (21.573)	-10.825 (9.057)	8.912 (23.851)	-3.381 (4.765)	-7.293 * (2.994)	-12.690 (10.054)
	high	-41.011 ° (22.964)	-17.693 * (8.975)	5.625 (24.608)	-4.457 (5.278)	-9.836 ** (3.141)	-17.317 (10.792)
Trade services and food	low	-38.465 (25.513)	-5.288 (11.588)	27.889 (26.823)	-1.086 (5.229)	-9.024 * (3.788)	-21.789 ° (12.072)
	high	-33.108 (22.809)	-23.230 ** (8.097)	-13.352 (23.845)	-6.752 (5.948)	-8.105 ** (2.783)	-8.218 (9.773)
Recreation service	low	-15.936 (25.317)	0.351 (10.803)	16.639 (23.742)	-8.063 (6.777)	-10.308 ** (3.656)	-11.483 (9.864)
	high	-55.638 * (28.266)	-28.869 ** (9.651)	-2.101 (19.879)	0.225 (5.729)	-6.821 * (3.114)	-18.524 * (9.292)
Knowledge intensive production	low	-27.906 (20.374)	-1.485 (10.786)	24.935 (25.988)	-6.609 (5.521)	-12.046 ** (3.795)	-18.946 ° (11.473)
	high	-43.668 * (21.081)	-27.033 ** (8.405)	-10.398 (27.013)	-1.229 (4.343)	-5.083 ° (2.669)	-11.061 (11.176)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

The direct negative relation to population development might therefore be interpreted as a reaction to a general lack of economic diversity and dynamic in regions characterised by a strong focus in health service. A relatively high relevance of simple or large scale production does not seem to compensate for the perceived lack of opportunities in these regions in medium and remote locations.

Table 49: Direct and indirect relations between factor "Health service" and population development conditional on remoteness and other industrial factors with point specific significances

Interaction with	Level	Health service					
		Population development direct			Population development via joblessness		
		Central	Medium	Remote	Central	Medium	Remote
None		0.249 (0.416)	-0.444 ** (0.161)	-1.137 ** (0.434)	-0.248 (0.238)	-0.355 *** (0.093)	-0.455 ° (0.252)
Professional service	low	0.434 (0.514)	-0.628 ** (0.208)	-1.690 ** (0.581)	-0.448 (0.301)	-0.322 ** (0.115)	-0.202 (0.314)
	high	0.064 (0.492)	-0.260 (0.319)	-0.585 (0.772)	-0.048 (0.274)	-0.388 * (0.178)	-0.708 (0.441)
Simple production	low	-0.053 (0.445)	-0.431 ° (0.251)	-0.808 (0.554)	0.074 (0.248)	-0.412 ** (0.141)	-0.870 * (0.350)
	high	0.552 (0.604)	-0.457 ** (0.172)	-1.467 ** (0.563)	-0.569 (0.360)	-0.297 ** (0.095)	-0.040 (0.298)
Primary and related production	low	0.630 (0.414)	-0.477 * (0.231)	-1.585 * (0.636)	-0.452 ° (0.236)	-0.497 *** (0.131)	-0.539 (0.356)
	high	-0.131 (0.674)	-0.411 (0.259)	-0.690 (0.532)	-0.043 (0.381)	-0.212 (0.145)	-0.371 (0.294)
Large scale production	low	-0.265 (0.494)	-0.377 ° (0.205)	-0.489 (0.552)	-0.214 (0.280)	-0.302 ** (0.116)	-0.385 (0.301)
	high	0.763 (0.520)	-0.511 * (0.204)	-1.786 ** (0.554)	-0.282 (0.299)	-0.407 *** (0.116)	-0.525 (0.320)
Trade services and food	low	0.262 (0.582)	-0.327 (0.261)	-0.916 (0.610)	-0.069 (0.328)	-0.374 * (0.147)	-0.661 ° (0.355)
	high	0.237 (0.516)	-0.561 ** (0.184)	-1.359 * (0.539)	-0.426 (0.303)	-0.336 ** (0.104)	-0.249 (0.295)
Recreation service	low	0.324 (0.571)	-0.471 ° (0.243)	-1.266 * (0.536)	-0.509 (0.336)	-0.427 ** (0.138)	-0.348 (0.296)
	high	0.175 (0.646)	-0.417 ° (0.220)	-1.009 * (0.457)	0.014 (0.362)	-0.282 * (0.122)	-0.562 * (0.272)
Knowledge intensive production	low	0.285 (0.464)	-0.515 * (0.243)	-1.315 * (0.591)	-0.417 (0.273)	-0.499 *** (0.139)	-0.575 ° (0.339)
	high	0.213 (0.481)	-0.373 ° (0.192)	-0.960 (0.610)	-0.078 (0.271)	-0.210 * (0.106)	-0.335 (0.336)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, a high relative concentration of the health industry is negatively related to all income relevant indicators. This result supports the interpretation of the health care industry as a residual activity that shows a relatively high share in economic activity if few occupational alternatives exist.

5 Results: The socio-economic fundamentals perspective

While in Chapter 4 the focus was on the comparison of the relation between industry structure and different economic fundamentals in central, remote and medium regions, Chapter 5 tries to identify those industries that are relevant for specific socio-economic conditions in different locations. Thereby, it presents the same results from a different perspective. In order to concentrate on the most significant aspects for different locations and to reduce repetition of Chapter 4, in this chapter only results for central regions on the one hand and remote regions on the other are discussed. The most significant results for regions in medium locations can be found in the second part of the appendix (Appendix 2).

5.1 GDP per inhabitant

As GDP per inhabitant is at the basis of the causal chain that forms the core of the mediation analysis, there are only direct relations estimated between industry structure factors and regional productivity. In remote regions, significant relationships to GDP are found only with respect to few industrial factors (Table 50). Regional productivity in remote districts relates positively to knowledge-intensive production activities. This positive relation is specifically strong if the knowledge intensive production activities are accompanied by a relatively high prevalence of professional services or large scale production.

Professional services themselves show positive relations to GDP only under specific conditions. Specifically, there is a positive relationship between professional services and regional productivity if it is accompanied by a relatively high share of employees in knowledge-intensive production activities, while there is a negative relation with a low share of employees in knowledge intensive production activities. Obviously, in remote regions, there is a strong complementarity between professional services and knowledge-intensive production with respect to regional productivity.

Table 50: Significant relations between industrial factors and GDP per inhabitant conditional on other industrial factors in remote districts

		GDP Remote		
		Professional service	Recreation service	Knowledge intensive production
Interaction with	Level	direct	direct	direct
None		1.337 (1.597)	1.180 (1.427)	5.383 ** (1.688)
Professional service	low		2.157 (2.011)	-0.986 (2.168)
	high		0.204 (2.757)	11.752 *** (2.665)
Simple production	low	0.094 (1.997)	2.152 (1.337)	6.766 ** (2.074)
	high	2.579 (2.406)	0.208 (2.067)	4.000 * (2.000)
Primary and related production	low	0.181 (2.080)	2.172 (2.059)	6.124 * (2.493)
	high	2.493 (2.037)	0.189 (1.394)	4.642 * (2.028)
Large scale production	low	3.945 ° (2.285)	-1.594 (1.948)	2.473 (1.995)
	high	-1.272 (2.260)	3.955 * (1.979)	8.293 *** (1.992)
Trade services and food	low	3.347 ° (2.000)	0.136 (1.997)	3.926 ° (2.060)
	high	-0.673 (2.143)	2.224 (1.847)	6.839 ** (2.405)
Recreation service	low	2.306 (2.517)		4.436 ° (2.284)
	high	0.367 (2.496)		6.330 ** (2.375)
Knowledge intensive production	low	-4.826 * (2.283)	0.257 (1.827)	
	high	7.499 ** (2.366)	2.104 (2.374)	
Health service	low	-2.490 (2.028)	1.242 (1.747)	4.439 * (1.981)
	high	5.163 * (2.241)	1.119 (1.371)	6.327 ** (2.126)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central districts, professional services are, as in remote regions, rather positively related to GDP per inhabitant (Table 51).

Table 51: Significant relations between industrial factors and GDP per inhabitant conditional on other industrial factors in central districts

		GDP			
		Central			
		Professional service	Trade service and food	Recreation service	Knowledge intensive production
Interaction with	Level	direct	direct	direct	direct
None		2.356 (1.688)	-5.253 *** (1.232)	-4.626 ** (1.687)	-2.168 (1.686)
Professional service	low		-6.240 *** (1.665)	-4.296 ° (2.355)	0.085 (1.837)
	high		-4.265 ** (1.532)	-4.957 * (2.479)	-4.420 * (1.811)
Simple production	low	4.948 *** (1.428)	-4.144 ** (1.392)	-5.610 *** (1.569)	-1.610 (1.673)
	high	-0.236 (2.444)	-6.361 *** (1.847)	-3.642 (2.674)	-2.726 (2.249)
Primary and related production	low	5.628 *** (1.260)	-7.325 *** (1.404)	-4.758 * (2.088)	-1.803 (1.506)
	high	-0.916 (2.319)	-3.181 ° (1.805)	-4.494 ° (2.655)	-2.532 (2.412)
Large scale production	low	0.296 (1.736)	-2.268 (1.451)	0.006 (2.075)	0.187 (1.653)
	high	4.416 * (1.979)	-8.237 *** (1.389)	-9.259 *** (2.430)	-4.522 * (1.916)
Trade services and food	low	1.404 (1.863)		-3.224 (2.198)	0.389 (1.766)
	high	3.307 (2.040)		-6.028 ** (2.229)	-4.724 * (2.118)
Recreation service	low	2.684 (1.799)	-3.808 * (1.715)		-0.883 (1.982)
	high	2.028 (2.894)	-6.698 ** (2.112)		-3.453 (2.681)
Knowledge intensive production	low	4.536 * (1.891)	-2.685 ° (1.388)	-3.374 (2.095)	
	high	0.176 (1.739)	-7.820 *** (1.744)	-5.879 * (2.542)	
Health service	low	1.319 (1.811)	-2.776 ° (1.473)	-5.147 * (2.240)	0.729 (1.771)
	high	3.393 ° (1.881)	-7.730 *** (1.700)	-4.106 * (1.887)	-5.064 ** (1.815)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Nevertheless, in central regions, this is specifically the case where the accompanying share of activities in simple, primary and related and knowledge-intensive production is low. This implies that the complementarity with production activity is not of relevance here, but instead the concentration of professional services in agglomerated areas is important for their economic effectiveness. Other than in remote districts, trade service and food-related activities, recreational services and knowledge-intensive production relate unambiguously negatively to regional productivity in central regions. The negative relation of knowledge-intensive production to GDP per inhabitant is specifically evident with a high accompanying share of professional or health services or production activities.

In summary, in central districts regional productivity is positively related to a concentration of professional services in the first instance. In remote districts, knowledge intensive production is most significantly related to a high GDP per inhabitant, but this relation is conditional on a relatively high share of economic services in the economy. The complementarity between industries seems to be more important in this respect than the concentration of specific industries in remote areas.

5.2 Joblessness

There are more significant relations of industrial factors to joblessness than to GDP in remote districts even though most of the relations are direct (Table 52). Activities of simple production, in trade services and food and in knowledge-intensive production relate to a relatively low joblessness in remote districts. While this relation is unconditional for simple production, for trade services it depends upon the prevalence of professional services or large scale or knowledge intensive production. The negative relation is rather weak for knowledge intensive production itself and conditional on a high share of professional services, large scale production, trade services and food, or recreation or health services.

Primary and related production, large scale production and health services, on the contrary, relate to a relatively high joblessness. This is specifically true if there is a low share of simple production activities in the same districts. Accordingly, for a high labour market participation, there need to be activities that provide jobs for unqualified labour in addition to jobs in other industries.

Table 52: Significant relations between industrial factors and joblessness conditional on other industrial factors in remote districts

		Joblessness						
		Remote						
		Simple production	Primary and related production	Large scale production	Trade service and food	Recreation service	Knowledge intensive production	Health service
Interaction with	Level	direct	direct	direct	direct	direct	via GDP	direct
None		-1.750 *** (0.477)	1.601 ** (0.519)	1.403 ** (0.491)	-1.327 * (0.538)	0.523 (0.605)	-0.776 ° (0.426)	1.044 * (0.526)
Professional service	low	-2.290 *** (0.683)	1.289 ** (0.445)	0.337 (0.755)	-0.510 (0.712)	0.750 (0.856)	0.142 (0.319)	0.464 (0.711)
	high	-1.210 (0.914)	1.913 ° (0.981)	2.468 ** (0.947)	-2.144 * (0.865)	0.295 (1.163)	-1.694 * (0.855)	1.623 ° (0.941)
Simple production	low		2.423 *** (0.696)	2.286 *** (0.674)	-0.882 (0.659)	0.648 (0.568)	-0.975 ° (0.532)	1.997 ** (0.662)
	high		0.779 (0.555)	0.519 (0.665)	-1.772 * (0.707)	0.397 (0.874)	-0.577 (0.388)	0.091 (0.684)
Primary and related production	low	-0.932 (0.667)		1.205 (0.778)	-1.500 * (0.734)	1.082 (0.871)	-0.883 (0.536)	1.236 (0.766)
	high	-2.568 *** (0.513)		1.600 ** (0.509)	-1.154 * (0.550)	-0.037 (0.591)	-0.669 (0.420)	0.852 (0.647)
Large scale production	low	-0.864 (0.617)	1.401 * (0.693)		-0.357 (0.700)	-0.352 (0.825)	-0.356 (0.329)	0.883 (0.659)
	high	-2.636 *** (0.701)	1.801 ** (0.668)		-2.296 ** (0.709)	1.397 ° (0.840)	-1.195 ° (0.610)	1.205 ° (0.680)
Trade services and food	low	-1.319 * (0.552)	1.433 * (0.675)	2.338 ** (0.710)		0.815 (0.843)	-0.566 (0.391)	1.516 * (0.738)
	high	-2.181 ** (0.695)	1.769 ** (0.575)	0.468 (0.602)		0.231 (0.785)	-0.986 ° (0.564)	0.572 (0.663)
Recreation service	low	-1.624 ** (0.594)	2.161 ** (0.718)	0.533 (0.652)	-1.026 (0.781)		-0.639 (0.438)	0.799 (0.653)
	high	-1.876 ** (0.675)	1.041 (0.633)	2.272 ** (0.839)	-1.628 * (0.776)		-0.913 ° (0.535)	1.289 * (0.549)
Knowledge intensive production	low	-1.342 * (0.677)	0.255 (0.691)	1.602 * (0.625)	-0.040 (0.704)	0.347 (0.774)		1.318 ° (0.718)
	high	-2.159 ** (0.662)	2.947 ** (0.921)	1.203 ° (0.691)	-2.614 ** (0.932)	0.698 (1.017)		0.769 (0.750)
Health service	low	-0.853 (0.623)	1.783 * (0.703)	1.252 ° (0.641)	-0.868 (0.683)	0.291 (0.742)	-0.640 (0.406)	
	high	-2.647 *** (0.617)	1.419 * (0.670)	1.554 * (0.611)	-1.786 * (0.722)	0.754 (0.579)	-0.912 ° (0.513)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central as in remote districts, simple production relates unambiguously to a relatively low joblessness (Table 53). Knowledge-intensive production shows a similar negative relation to joblessness in central regions as compared to remote regions as well. Nevertheless, there are

marked differences in the relationship between joblessness and other industries between central and remote districts. In central regions, a high prevalence of primary and related production relates to a relatively low joblessness. Maybe the most plausible explanation for this negative relation is connected to general socio-economic conditions of centers in rural regions.

Table 53: Significant relations between industrial factors and joblessness conditional on other industrial factors in central districts

		Joblessness							
		Central							
Interaction with	Level	Professional service	Simple production	Primary and related production	Large scale production	Trade service and food	Recreation service	Knowledge intensive production	Health service
		via GDP	direct	direct	direct	via GDP	direct	direct	direct
None		-0.253 (0.209)	-2.480 *** (0.485)	-2.820 *** (0.468)	-0.602 (0.452)	0.564 * (0.267)	-2.468 *** (0.726)	-0.729 (0.713)	0.536 (0.502)
Professional service	low		-2.235 ** (0.678)	-2.882 *** (0.482)	-0.989 (0.632)	0.670 * (0.329)	-2.309 * (1.011)	-0.630 (0.775)	0.969 (0.618)
	high		-2.725 *** (0.670)	-2.758 *** (0.678)	-0.215 (0.484)	0.458 ° (0.250)	-2.627 * (1.052)	-0.829 (0.771)	0.103 (0.593)
Simple production	low	-0.531 * (0.267)		-3.634 *** (0.625)	-0.465 (0.514)	0.445 ° (0.236)	-1.951 ** (0.701)	-1.279 ° (0.707)	-0.160 (0.536)
	high	0.025 (0.262)		-2.007 ** (0.672)	-0.739 (0.628)	0.683 * (0.344)	-2.985 ** (1.131)	-0.179 (0.951)	1.231 ° (0.735)
Primary and related production	low	-0.604 * (0.283)	-3.290 *** (0.544)		-1.225 * (0.537)	0.786 * (0.357)	-2.815 ** (0.896)	0.024 (0.637)	0.978 * (0.465)
	high	0.098 (0.252)	-1.670 * (0.759)		0.020 (0.635)	0.341 (0.239)	-2.121 ° (1.127)	-1.482 (1.019)	0.094 (0.825)
Large scale production	low	-0.032 (0.187)	-2.342 *** (0.586)	-3.448 *** (0.603)		0.243 (0.185)	-2.036 * (0.877)	-0.863 (0.698)	0.462 (0.597)
	high	-0.474 (0.288)	-2.618 *** (0.615)	-2.193 *** (0.601)		0.884 * (0.393)	-2.900 ** (1.056)	-0.595 (0.815)	0.609 (0.635)
Trade services and food	low	-0.151 (0.209)	-2.507 *** (0.576)	-2.830 *** (0.633)	-0.419 (0.515)		-2.894 ** (0.939)	-1.701 * (0.745)	0.148 (0.710)
	high	-0.355 (0.263)	-2.453 *** (0.730)	-2.810 *** (0.641)	-0.785 (0.568)		-2.042 * (0.953)	0.243 (0.900)	0.923 (0.626)
Recreation service	low	-0.288 (0.227)	-1.964 ** (0.636)	-3.168 *** (0.719)	-0.172 (0.582)	0.409 (0.249)		-0.390 (0.844)	1.102 (0.689)
	high	-0.218 (0.323)	-2.996 *** (0.882)	-2.472 * (0.971)	-1.032 (0.944)	0.719 ° (0.373)		-1.068 (1.141)	-0.031 (0.783)
Knowledge intensive production	low	-0.487 ° (0.285)	-3.015 *** (0.620)	-2.085 *** (0.631)	-0.732 (0.498)	0.288 (0.190)	-2.138 * (0.887)		0.903 (0.558)
	high	-0.019 (0.187)	-1.945 ** (0.672)	-3.556 *** (0.668)	-0.473 (0.534)	0.839 * (0.393)	-2.798 * (1.102)		0.168 (0.586)
Health service	low	-0.142 (0.203)	-3.135 *** (0.625)	-2.402 *** (0.589)	-0.671 (0.569)	0.298 (0.200)	-1.933 * (0.963)	-0.373 (0.748)	
	high	-0.364 (0.251)	-1.825 ** (0.606)	-3.238 *** (0.664)	-0.533 (0.556)	0.830 * (0.387)	-3.003 *** (0.803)	-1.085 (0.774)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

There is a marked and unambiguously negative relationship between recreational services and joblessness in central districts as in contrast to remote regions, while a high prevalence of trade service and food-related activities relates to a high joblessness.

In summary, simple production activities relate most significantly and unconditionally to low joblessness. Generally, in central regions more industrial types relate to a lower joblessness than in remote districts. With caution, this might be interpreted as a hint that more specialised and mobile labour markets adapt better to given industry concentrations than in remote districts.

5.3 Wages

There is only a direct significant relationship between industrial structure and wages, i.e., the relationship is not mediated by GDP or joblessness (Table 54 and 55). This implies that the wage level does not depend upon GDP per inhabitant or regional productivity and joblessness but instead on industry-related characteristics. The main characteristics are probably the industry's internal labour differentiation and its specific productivity in the respective type of region.

Interestingly, in remote districts, professional services relate negatively to the wage level (Table 54). This holds specifically true where there is a relatively high share in other activities with a relatively high demand in qualification (health service, knowledge-intensive production) or where there is a low share in simple production activities with its supply of jobs for unqualified labour. In these regions, the type of activities or the productivity of those production activities that provide the majority of jobs seem to induce low payments for jobs with lower qualification demands.

A similar explanation might apply to the observation of the negative relation between wages and trade services and food-related activities or between wages and activities related to primary production, if the latter are complemented by a high share of simple production, knowledge intensive production or recreation services. This last observation might also partly be explained by the usually relatively low costs of living in rural regions with a high share of primary production activities.

Simple production itself relates positively to the wage level in remote districts, specifically if complemented by a relatively high share of professional services. These two activities obviously complement each other in terms of labour productivity. Recreational services relate positively to wages in remote regions but the most significant and unambiguous positive relation to wages is that of large scale production. Obviously, jobs in large firms go along with high labour productivity.

Table 54: Significant relations between industrial factors and wages conditional on other industrial factors in remote districts

		Wage						
		Remote						
Interaction with	Level	Professional service	Simple production	Primary and related production	Large scale production	Trade service and food	Recreation service	Knowledge intensive production
		direct	direct	direct	direct	direct	direct	direct
None		-99.887 ** (37.075)	82.459 ** (31.031)	-98.254 *** (28.360)	104.080 *** (26.777)	-72.174 * (30.281)	78.579 * (32.723)	107.088 ** (38.897)
Professional service	low		-36.707 (41.485)	-77.695 ** (25.085)	127.217 ** (40.665)	-42.818 (39.335)	68.750 (46.607)	139.200 ** (49.470)
	high		201.624 *** (51.642)	-118.813 * (53.157)	80.943 (51.586)	-101.530 * (47.517)	88.409 (62.665)	74.976 (62.284)
Simple production	low	-218.496 *** (46.109)		-67.722 ° (38.294)	107.425 ** (36.850)	-48.732 (35.885)	33.604 (30.798)	95.920 * (47.872)
	high	18.723 (55.337)		-128.787 *** (29.966)	100.735 ** (36.065)	-95.616 * (39.967)	123.555 ** (47.162)	118.256 ** (45.753)
Primary and related production	low	-79.516 (48.949)	112.854 ** (38.906)		133.452 ** (42.321)	-126.091 ** (41.600)	117.303 * (47.496)	146.654 * (57.341)
	high	-120.257 ** (46.538)	52.064 (34.077)		74.708 ** (27.811)	-18.257 (30.020)	39.856 (31.821)	67.522 (46.506)
Large scale production	low	-76.776 (54.174)	85.815 * (36.179)	-68.644 ° (37.554)		-71.297 ° (38.781)	43.694 (44.627)	123.755 ** (45.472)
	high	-122.997 * (51.851)	79.102 ° (43.015)	-127.864 *** (36.704)		-73.051 ° (39.310)	113.464 * (46.447)	90.421 ° (46.429)
Trade services and food	low	-71.605 (46.221)	105.149 ** (32.934)	-150.678 *** (36.627)	104.926 ** (38.876)		65.968 (45.452)	99.071 * (47.181)
	high	-128.169 ** (49.419)	59.768 (42.733)	-45.831 (31.958)	103.234 ** (32.453)		91.191 * (42.692)	115.106 * (55.479)
Recreation service	low	-109.646 ° (57.382)	37.598 (36.499)	-59.454 (39.208)	69.407 ° (35.527)	-85.170 * (42.412)		112.408 * (52.626)
	high	-90.128 (57.940)	127.319 ** (40.245)	-137.054 *** (34.677)	138.753 ** (46.420)	-59.178 (43.477)		101.769 ° (54.928)
Knowledge intensive production	low	-68.814 (53.312)	71.601 ° (40.902)	-59.615 (37.240)	120.226 *** (33.951)	-80.227 * (38.779)	83.764 * (41.879)	
	high	-130.960 * (54.749)	93.316 * (39.210)	-136.894 ** (50.342)	87.934 * (37.484)	-64.121 (51.266)	73.395 (54.866)	
Health service	low	-71.980 (47.100)	96.973 ** (37.327)	-78.572 * (38.435)	138.243 *** (34.714)	-58.533 (37.357)	81.908 * (40.024)	112.375 * (45.388)
	high	-127.793 * (51.693)	67.944 ° (38.096)	-117.937 ** (36.286)	69.917 * (33.270)	-85.816 * (40.375)	75.251 * (31.559)	101.801 * (48.959)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central districts, in contrast, professional services relate most significantly and unambiguously to the wage level (Table 55). This is in accordance with the deduced high productivity of professional services if these are concentrated in agglomerated districts (Section 5.1). Trade

services and food-related activities relate negatively to the wage level as in remote districts. This is to be explained by their generally low wages and the relative lack of better paid jobs in respective regions. While recreation service seems to complement other activities in remote regions and indicate relatively well paid jobs there, this complementary effect does not apply for central districts. Here, probably due to the generally low level of wages in recreation services related activities, they relate unconditionally negatively to the regional wage level.

Table 55: Significant relations between industrial factors and wages conditional on other industrial factors in central districts

		Wage					
		Central					
		Professional service	Primary and related production	Large scale production	Trade service and food	Recreation service	Health service
Interaction with	Level	direct	direct	direct	direct	direct	direct
None		174.993 *** (38.871)	34.927 (26.770)	-15.828 (24.529)	-96.293 ** (29.737)	-190.768 *** (40.028)	-61.280 * (27.114)
Professional service	low		-19.812 (28.668)	-18.724 (34.517)	-109.739 ** (39.846)	-217.042 *** (55.375)	-106.869 ** (33.588)
	high		89.666 * (37.310)	-12.933 (26.066)	-82.848 * (35.672)	-164.494 ** (57.204)	-15.691 (31.967)
Simple production	low	180.999 *** (34.512)	14.573 (36.229)	-13.795 (27.799)	-68.619 * (32.550)	-132.862 *** (38.571)	-60.438 * (28.904)
	high	168.986 ** (55.569)	55.280 (36.644)	-17.861 (34.000)	-123.968 ** (43.973)	-248.674 *** (61.636)	-62.122 (39.824)
Primary and related production	low	120.755 *** (31.606)		-18.251 (29.723)	-20.361 (34.978)	-249.764 *** (51.141)	-142.790 *** (25.614)
	high	229.230 *** (52.815)		-13.406 (34.200)	-172.226 *** (41.420)	-131.772 * (61.139)	20.230 (44.486)
Large scale production	low	172.100 *** (39.918)	32.485 (33.889)		-92.731 ** (33.918)	-33.491 (47.648)	-71.179 * (32.241)
	high	177.885 *** (45.765)	37.368 (33.887)		-99.856 ** (34.324)	-348.045 *** (58.860)	-51.381 (34.247)
Trade services and food	low	162.039 *** (42.780)	108.756 ** (35.009)	-12.392 (27.897)		-158.590 ** (51.225)	-57.490 (38.244)
	high	187.946 *** (46.957)	-38.903 (36.252)	-19.265 (30.758)		-222.946 *** (52.479)	-65.070 ° (33.855)
Recreation service	low	148.908 *** (41.077)	-24.185 (40.095)	140.492 *** (31.775)	-63.134 (39.602)		-45.357 (37.281)
	high	201.077 ** (66.511)	94.039 ° (54.653)	-172.149 *** (51.898)	-129.453 ** (50.084)		-77.203 ° (42.165)
Knowledge intensive production	low	131.770 ** (43.983)	22.700 (35.025)	-66.749 * (27.006)	-123.285 *** (33.112)	-166.911 *** (48.647)	-85.892 ** (30.218)
	high	218.215 *** (39.767)	47.153 (37.456)	35.093 (28.924)	-69.301 ° (41.318)	-214.625 *** (59.961)	-36.668 (31.579)
Health service	low	132.267 ** (41.804)	-42.170 (33.335)	-25.116 (30.772)	-92.606 ** (34.540)	-175.737 *** (52.339)	
	high	217.718 *** (43.258)	112.023 ** (36.932)	-6.540 (30.160)	-99.980 * (40.654)	-205.799 *** (44.472)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In summary, it is not supply and demand on the regional level that explains wage levels, as the relationship to industrial structure is not mediated by *regional* productivity and joblessness. Instead, wage differences are to be explained by the types of jobs industries provide and be industrial productivity. In central districts the high relevance of concentrated professional services for economic prosperity is underscored by the positive relation to wages. Relative concentration of specific service activities is not necessary in central districts for the location of other well paid activities, therefore these services, due to their low payments, relate negatively to wages. In remote regions, in contrast, recreational services indicate the possible location of other better paid activities. Here, large scale production unconditionally relates to relatively high wages.

5.4 Household income

Household income, too, in remote districts, relates mainly directly to industrial factors (Table 56). This implies that the effect is not due to the industrial structure's relation to wages or joblessness. Instead other, unobserved factors must contribute to the measured relation. The most obvious factor is labour market participation that does not relate to official statistics of joblessness. In this respect, the labour market participation of women is one important point in case. Another unmeasured factor that potentially relates to higher household incomes are additional income-generating activities in districts with a higher demand for specific services or with higher positive income and multiplier effects.

Simple production is the economic activity that relates most positively to household income in remote districts. Professional services, once again, relate positively to household income if accompanied by relatively high shares of production activities. The complementarities seem to serve the generation of additional income sources and a higher labour market participation. They serve a higher regional productivity despite the fact that they relate to relatively low wages in remote districts. Knowledge-intensive production and primary and related production both relate positively to household income under similar conditions: with a high share of professional or health services or a low share of simple production and recreational services. While the first rely on qualified labour, the latter depend upon lower qualification levels. Accordingly, if labour is generally more highly qualified within a region with a nevertheless diversified industry structure, this seems to contribute to additional income-generating activities.

Table 56: Significant relations between industrial factors and household income conditional on other industrial factors in remote districts

		Household income			
		Remote			
		Professional service	Simple production	Primary and related production	Knowledge intensive production
Interaction with	Level	direct	direct	direct	direct
None		60.553 ° (36.170)	80.513 ** (29.043)	50.303 ° (27.881)	47.393 (36.616)
Professional service	low		20.679 (38.327)	-1.728 (26.376)	-16.122 (46.090)
	high		140.348 ** (48.626)	102.334 * (49.469)	110.908 ° (58.015)
Simple production	low	0.998 (44.959)		81.049 * (36.115)	96.772 * (45.149)
	high	120.108 * (52.170)		19.557 (29.951)	-1.986 (42.548)
Primary and related production	low	8.998 (45.797)	111.120 ** (36.525)		2.214 (53.587)
	high	112.108 * (45.589)	49.907 (31.522)		92.572 * (43.215)
Large scale production	low	71.803 (52.105)	77.087 * (33.584)	52.585 (35.986)	39.205 (42.755)
	high	49.303 (48.597)	83.940 * (40.084)	48.021 (35.166)	55.581 (43.221)
Trade services and food	low	100.682 * (44.120)	72.245 * (31.366)	45.806 (36.238)	35.763 (43.869)
	high	20.424 (47.120)	88.782 * (39.406)	54.800 ° (30.086)	59.023 (51.839)
Recreation service	low	40.271 (55.576)	58.314 ° (33.621)	84.877 * (38.024)	122.521 * (49.058)
	high	80.835 (53.733)	102.713 ** (38.050)	15.729 (33.030)	-27.735 (51.074)
Knowledge intensive production	low	-0.907 (49.869)	128.519 *** (38.340)	6.182 (35.301)	
	high	122.013 * (52.529)	32.508 (36.335)	94.424 * (47.654)	
Health service	low	56.685 (44.457)	42.781 (34.996)	7.666 (37.539)	9.754 (42.563)
	high	64.421 (49.593)	118.246 *** (35.260)	92.940 ** (34.244)	85.032 ° (45.609)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central districts, there are direct relationships between industrial structure and household income as found in remote districts, but there is an additional indirect relationship mediated via joblessness (Tables 57 and 58). While simple production relates directly to higher household

income in remote districts, the positive relation is mediated by the lower joblessness in central districts (Table 57).

Table 57: Significant relations between industrial factors and household income conditional on other industrial factors in central districts

		Household income					
		Central					
		Professional service	Simple production	Primary and related production		Large scale production	
Interaction with	Level	direct	via joblessness	direct	via joblessness	direct	via joblessness
None		36.544 (39.453)	54.041 ** (16.968)	-64.385 * (25.255)	61.461 *** (18.210)	-35.882 (23.275)	13.120 (10.364)
Professional service	low		48.705 * (19.009)	-73.714 * (29.761)	62.810 *** (18.657)	-18.940 (32.361)	21.560 (14.752)
	high		59.378 ** (20.628)	-55.057 (34.698)	60.112 ** (20.882)	-52.825 * (24.518)	4.680 (10.607)
Simple production	low	40.994 (35.473)		-1.126 (33.970)	79.187 *** (23.739)	-12.344 (26.116)	10.125 (11.482)
	high	32.094 (54.039)		-127.645 *** (34.053)	43.735 * (18.166)	-59.421 ° (31.858)	16.115 (14.237)
Primary and related production	low	27.301 (30.262)	71.687 *** (21.224)			-60.123 * (27.602)	26.686 * (13.409)
	high	45.787 (54.739)	36.395 ° (18.805)			-11.641 (32.362)	-0.447 (13.833)
Large scale production	low	53.467 (40.505)	51.036 ** (17.901)	-88.823 ** (32.051)	75.137 *** (22.651)		
	high	19.621 (45.122)	57.047 ** (19.389)	-39.948 (31.400)	47.785 ** (17.578)		
Trade services and food	low	8.569 (42.723)	54.627 ** (18.370)	-36.840 (33.193)	61.683 ** (20.485)	-39.918 (26.760)	9.131 (11.452)
	high	64.518 (46.317)	53.456 ** (20.629)	-91.931 ** (33.698)	61.239 ** (20.518)	-31.846 (28.549)	17.109 (13.070)
Recreation service	low	92.157 * (40.939)	42.795 * (17.401)	-52.578 (38.750)	69.045 ** (23.091)	-55.858 ° (31.557)	3.757 (12.720)
	high	-19.069 (63.653)	65.287 ** (25.032)	-76.193 (50.461)	53.877 * (24.958)	-15.906 (48.447)	22.483 (21.292)
Knowledge intensive production	low	37.138 (42.784)	65.703 ** (21.051)	-29.550 (32.579)	45.434 * (17.702)	-88.196 *** (25.535)	15.942 (11.545)
	high	35.949 (41.434)	42.379 * (17.961)	-99.221 ** (35.030)	77.487 ** (23.965)	16.432 (27.399)	10.298 (11.908)
Health service	low	70.518 ° (41.128)	68.310 ** (21.602)	-62.591 ° (32.112)	52.352 ** (18.166)	-20.409 (28.912)	14.624 (12.914)
	high	2.569 (44.019)	39.773 * (16.425)	-66.180 ° (34.407)	70.570 ** (22.581)	-51.355 ° (28.285)	11.616 (12.456)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

With respect to primary and related production activities, there is an ambiguous relationship to be observed: While there is a negative direct relationship to household income, there is an indirect positive relationship mediated by lower joblessness. This observation underscores the notion that the activity's relationship to lower joblessness in central regions depends upon the specific socio-economic characteristics of rural centers rather than upon industrial characteristics (see Section 5.2). Large scale production relates rather negatively to household income in central regions.

The detrimental effect of a high share of trade services and food-related activities in central districts is underscored by the negative relationship that carries through from related low regional productivity via higher joblessness to lower household income (Table 58). The relatively low joblessness that goes along with a high share of recreational services and knowledge-intensive production in central regions indirectly contributes to relatively high household income. The direct relationship to household income of central industry concentrations is generally rather small.

In summary, in central districts, joblessness is an important mediator for the relationship between industrial structure and household income. The main direct relationship in central districts is the negative relation between primary production and household income, which indicates a lack of additional income-generating options. The presence and absence of such options is the main explanation for the exclusively direct relationship between industrial structure and household income. The main insight is that in remote areas household income depends much more strongly on other income sources and on the labour market participation of those household members that do not usually appear in official unemployment statistics than it does in central districts. The results also underscore the relevance of complementary activities in remote areas.

Table 58: Further significant relations between industrial factors and household income conditional on other industrial factors in central districts

		Household income					
		Central					
		Trade service and food		Recreation service	Knowledge intensive production		Health service
Interaction with	Level	via GDP	via GDP and joblessness	via joblessness	direct	via joblessness	direct
None		-30.092 * (15.068)	-12.285 ° (6.557)	53.783 ** (20.606)	8.550 (35.549)	15.888 (16.023)	-33.875 (25.128)
Professional service	low	-35.750 ° (18.472)	-14.595 ° (8.009)	50.314 * (25.261)	9.164 (38.443)	13.718 (17.229)	2.376 (31.403)
	high	-24.434 ° (13.925)	-9.975 ° (5.976)	57.253 * (26.898)	7.935 (38.902)	18.057 (17.376)	-70.127 * (29.401)
Simple production	low	-23.742 ° (13.187)	-9.693 ° (5.674)	42.509 * (18.495)	-4.168 (35.528)	27.883 ° (16.854)	-8.476 (26.766)
	high	-36.442 ° (19.284)	-14.878 ° (8.339)	65.058 * (29.370)	21.268 (47.137)	3.892 (20.745)	-59.275 (36.749)
Primary and related production	low	-41.962 * (20.232)	-17.132 ° (8.845)	61.353 * (24.671)	44.220 (31.747)	-0.523 (13.883)	-31.978 (25.099)
	high	-18.222 (13.113)	-7.439 (5.527)	46.214 ° (27.047)	-27.121 (50.809)	32.298 (23.582)	-35.773 (41.023)
Large scale production	low	-12.993 (10.107)	-5.305 (4.241)	44.363 * (22.001)	-45.452 (34.733)	18.800 (15.888)	-17.384 (29.856)
	high	-47.191 * (22.344)	-19.266 * (9.792)	63.204 * (27.757)	62.551 (40.760)	12.975 (18.035)	-50.366 (31.610)
Trade services and food	low			63.064 * (25.663)	-7.013 (37.297)	37.064 * (18.620)	-33.196 (35.269)
	high			44.503 ° (23.461)	24.112 (44.855)	-5.289 (19.647)	-34.554 (31.363)
Recreation service	low	-21.814 (13.773)	-8.906 (5.859)		-136.259 ** (42.118)	8.502 (18.517)	-98.624 ** (34.345)
	high	-38.370 ° (20.847)	-15.665 ° (8.989)		153.358 ** (56.658)	23.273 (25.516)	30.874 (39.023)
Knowledge intensive production	low	-15.381 (10.468)	-6.280 (4.428)	46.585 * (22.465)			-45.893 (28.102)
	high	-44.803 * (22.198)	-18.291 ° (9.672)	60.982 * (28.302)			-21.858 (29.118)
Health service	low	-15.901 (10.985)	-6.492 (4.642)	42.130 ° (23.403)	-3.090 (37.180)	8.125 (16.412)	
	high	-44.283 * (21.878)	-18.079 ° (9.536)	65.436 ** (23.762)	20.189 (38.688)	23.650 (17.849)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

5.5 Tax revenues

Taxes relate directly and indirectly to the industrial structure of remote districts (Table 59). A direct relationship to taxes that is not mediated by regional productivity, joblessness, wages or household income may be due to specific industrial characteristics or to income and multiplier effects. Among specific industrial characteristics might be the power of firms to influence taxes to be paid, or respectively their ability to attribute incomes possibly relevant for the tax load to other locations or activities.

Table 59: Significant relations between industrial factors and tax revenues conditional on other industrial factors in remote districts

		Tax							
		Remote							
		Professional service		Simple production	Trade service and food	Knowledge intense production		Health service	
Interaction with	Level	direct	via GDP	via joblessness	via joblessness	direct	via GDP	direct	via joblessness
None		-25.227 (27.059)	11.782 (14.605)	25.157 ** (9.556)	19.074 * (9.237)	63.689 * (26.704)	47.451 * (21.640)	7.269 (19.076)	-15.004 ° (8.538)
Professional service	low			32.917 * (13.116)	7.334 (10.420)	24.123 (33.306)	-8.692 (19.328)	-29.413 (25.759)	-6.673 (10.378)
	high			17.397 (13.921)	30.814 * (14.864)	103.255 * (42.761)	103.595 * (41.576)	43.950 (33.871)	-23.334 (14.869)
Simple production	low	-100.294 ** (32.713)	0.832 (17.609)		12.677 (10.045)	99.593 ** (33.130)	59.641 * (26.914)	48.628 * (24.445)	-28.701 * (12.166)
	high	49.840 (39.092)	22.733 (22.506)		25.471 * (12.197)	27.785 (30.789)	35.261 ° (21.146)	-34.091 (24.580)	-1.306 (9.839)
Primary and related production	low	-21.656 (33.734)	1.592 (18.346)	13.394 (10.218)	21.564 ° (11.992)	65.289 ° (38.785)	53.981 ° (28.331)	11.332 (28.177)	-17.764 (11.974)
	high	-28.799 (33.870)	21.973 (19.378)	36.920 ** (12.232)	16.584 ° (9.044)	62.089 * (31.654)	40.921 ° (22.435)	3.206 (23.392)	-12.243 (9.841)
Large scale production	low	29.454 (38.801)	34.778 (23.200)	12.415 (9.452)	5.139 (10.158)	89.523 ** (30.947)	21.800 (19.007)	8.912 (23.851)	-12.690 (10.054)
	high	-79.908 * (35.408)	-11.213 (20.265)	37.898 ** (14.215)	33.010 * (13.415)	37.856 (31.696)	73.103 * (29.908)	5.625 (24.608)	-17.317 (10.792)
Trade services and food	low	-31.841 (32.447)	29.501 (20.157)	18.965 * (9.387)		125.979 *** (31.712)	34.611 (21.472)	27.889 (26.823)	-21.789 ° (12.072)
	high	-18.614 (35.097)	-5.936 (18.997)	31.348 * (12.982)		1.399 (38.083)	60.292 * (29.123)	-13.352 (23.845)	-8.218 (9.773)
Recreation service	low	-26.100 (41.067)	20.328 (23.183)	23.351 * (10.541)	14.749 (11.881)	30.690 (35.792)	39.100 (23.937)	16.639 (23.742)	-11.483 (9.864)
	high	-24.354 (39.222)	3.237 (22.032)	26.962 * (12.043)	23.400 ° (12.756)	96.688 ** (37.161)	55.803 * (27.924)	-2.101 (19.879)	-18.524 * (9.292)
Knowledge intensive production	low	-63.513 ° (36.112)	-42.545 ° (24.568)	19.285 ° (10.985)	0.577 (10.117)			24.935 (25.988)	-18.946 ° (11.473)
	high	13.059 (39.695)	66.110 * (30.239)	31.029 * (12.561)	37.571 * (16.672)			-10.398 (27.013)	-11.061 (11.176)
Health service	low	-59.605 ° (32.668)	-21.948 (19.295)	12.260 (9.519)	12.473 (10.353)	80.799 ** (30.899)	39.127 ° (21.743)		
	high	9.150 (36.720)	45.512 ° (24.849)	38.054 ** (13.409)	25.675 * (12.400)	46.579 (33.269)	55.776 * (26.315)		

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Professional services relate directly negatively to tax revenues in remote areas if there is a low relevance of simple production or knowledge-intensive production in these districts. This stresses again the complementarity between the different activities. The relatively high GDP per inhabitant in regions with a high relevance of professional services and knowledge intensive production translates into a positive indirect relation to tax revenues. The same holds true for the higher regional productivity that is generally connected with a high share of knowledge-intensive production in remote areas. This positive indirect relation is amplified by a direct positive relation of knowledge intensive activities to tax revenues, which is possibly explainable by positive income and multiplier effects.

Trade service and food-related activities as well as simple production relate indirectly positively to tax revenues in remote districts via the lower joblessness. The opposite indirect relationship applies to health services. Accordingly, alternative income sources seem to be the decisive argument with respect to household income, but less so in terms of tax revenues, which depend more significantly on joblessness.

In central districts, the indirect relationships are even more pronounced, specifically relationships mediated by wages become significant (Table 60). Again, professional services, other than in remote districts, relate unconditionally positively to tax revenues, directly as well as mediated via higher wages and GDP. The negative relations to GDP per inhabitant, or respectively to wages, carry through to the relationship to taxes in the case of trade service and food, recreational services and knowledge-intensive production. Health services relate directly negatively to tax revenues, possibly due to a reduced tax load or to low multiplier effects of the sector.

In summary, the relation between tax revenues and industrial structure, as expected, is largely mediated via GDP per inhabitant, joblessness and wages. With respect to tax revenues, joblessness is, other than with respect to other economic indicators in remote areas, an important argument. The complementarity between professional services and specific production activities is effective in terms of tax revenues as well. Additionally, knowledge-intensive production is an important positive argument for tax revenues in remote districts. In central districts the indirect effects on tax revenues are even more pronounced. Professional services are unconditionally positively related to tax revenues directly and indirectly in central districts.

Table 60: Significant relations between industrial factors and tax revenues conditional on other industrial factors in central districts

		Tax										
		Central										
Interaction with	Level	Professional service			Simple production	Large scale production		Trade service and food		Recreation service	Knowledge intense production	Health service
		direct	via wages	via GDP	via joblessness	direct	via wages	via GDP	via wages	via wages	via GDP	direct
None		85.650 ** (28.804)	36.760 * (14.319)	18.611 (14.027)	18.140 ° (10.796)	-14.019 (16.891)	-3.325 (5.261)	-41.493 ** (13.763)	-20.228 * (8.995)	-40.073 ** (15.334)	-17.123 (13.913)	-35.787 * (18.211)
Professional service	low				16.349 (10.442)	-22.425 (23.383)	-3.933 (7.359)	-49.295 ** (17.515)	-23.052 * (11.157)	-45.593 * (18.659)	0.671 (14.514)	-40.729 ° (22.688)
	high				19.931 (12.226)	-5.613 (17.922)	-2.717 (5.544)	-33.691 * (14.455)	-17.403 ° (9.336)	-34.554 * (16.330)	-34.918 * (16.486)	-30.845 (21.511)
Simple production	low	105.366 *** (25.860)	38.021 ** (14.163)	39.088 ** (14.535)		-14.634 (18.889)	-2.898 (5.913)	-32.737 * (13.410)	-14.414 ° (8.248)	-27.909 * (12.059)	-12.714 (13.547)	-32.985 ° (19.490)
	high	65.934 ° (39.343)	35.498 * (16.288)	-1.867 (19.310)		-13.403 (23.139)	-3.752 (7.242)	-50.248 ** (18.755)	-26.041 * (12.440)	-52.238 * (21.144)	-21.532 (18.470)	-38.588 (26.648)
Primary and related production	low	52.542 * (22.153)	25.366 * (10.486)	44.459 ** (14.418)	24.064 ° (14.098)	1.043 (20.393)	-3.834 (6.363)	-57.860 *** (17.526)	-4.277 (7.474)	-52.466 ** (19.932)	-14.245 (12.359)	-41.648 * (18.188)
	high	118.758 ** (39.828)	48.153 * (18.987)	-7.237 (18.399)	12.217 (8.831)	-29.080 (23.441)	-2.816 (7.241)	-25.125 (15.430)	-36.178 * (14.482)	-27.681 ° (15.601)	-20.002 (19.620)	-29.925 (29.668)
Large scale production	low	77.254 ** (29.737)	36.152 * (14.288)	2.338 (13.724)	17.131 (10.541)			-17.915 (12.208)	-19.479 * (9.467)	-7.035 (10.259)	1.476 (13.065)	-30.562 (21.573)
	high	94.047 ** (32.737)	37.367 * (15.343)	34.884 * (17.648)	19.149 (11.665)			-65.070 *** (18.800)	-20.976 * (9.851)	-73.112 ** (26.462)	-35.723 * (17.299)	-41.011 ° (22.964)
Trade services and food	low	97.026 ** (30.882)	34.039 * (14.121)	11.094 (14.943)	18.337 (11.134)	-6.379 (19.421)	-2.603 (5.919)			-33.314 * (15.147)	3.072 (13.971)	-38.465 (25.513)
	high	74.275 * (34.207)	39.481 * (16.028)	26.127 (17.241)	17.944 (11.412)	-21.659 (20.667)	-4.047 (6.590)			-46.833 * (18.604)	-37.318 * (18.881)	-33.108 (22.809)
Recreation service	low	12.307 (30.195)	31.280 * (13.215)	21.203 (15.056)	14.365 (9.320)	-65.112 ** (23.252)	29.512 * (11.564)	-30.078 * (15.276)	-13.262 (9.339)		-6.973 (15.746)	-15.936 (25.317)
	high	158.993 *** (46.071)	42.239 * (19.439)	16.019 (23.169)	21.915 (13.905)	37.075 (35.062)	-36.162 * (15.898)	-52.907 * (20.794)	-27.193 * (13.653)		-27.274 (22.124)	-55.638 * (28.266)
Knowledge intensive production	low	92.966 ** (31.056)	27.680 * (12.799)	35.830 * (17.142)	22.055 ° (13.200)	-13.634 (18.961)	-14.022 ° (7.233)	-21.209 ° (12.043)	-25.898 * (10.819)	-35.062 * (15.176)		-27.906 (20.374)
	high	78.335 * (30.401)	45.839 ** (16.880)	1.392 (13.744)	14.226 (9.385)	-14.403 (19.822)	7.372 (6.518)	-61.777 ** (19.995)	-14.558 (9.851)	-45.085 * (19.152)		-43.668 * (21.081)
Health service	low	81.019 ** (30.288)	27.784 * (12.496)	10.417 (14.515)	22.930 ° (13.673)	-9.117 (20.897)	-5.276 (6.681)	-21.925 ° (12.719)	-19.453 * (9.560)	-36.916 * (16.138)	5.758 (14.055)	
	high	90.282 ** (31.905)	45.735 ** (17.226)	26.804 ° (16.136)	13.351 (8.715)	-18.920 (20.590)	-1.374 (6.351)	-61.060 ** (19.632)	-21.002 ° (10.867)	-43.231 ** (16.692)	-40.004 * (17.135)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

5.6 Population development

As would have been expected, industrial structure is indirectly related to population development via joblessness in many cases. Thereby, in remote districts, simple production and trade service and food-related activities translate into rather positive population developments (Table 61). Nevertheless, this positive relation to simple production is more than compensated in remote districts by a negative direct relation.

Direct relationships are not mediated by GDP per inhabitant, joblessness, the local wage level, household incomes or tax revenues. Therefore, they need to be explained in terms of unmeasured characteristics, like, for example alternative income opportunities, cultural traits or natural amenities. Specifically alternative income opportunities and cultural traits might be rather undeveloped in regions characterised by simple production, explaining their negative direct relationship to population development. On the other hand, recreation services show a direct positive relationship to population development, possibly due to the positive cultural traits or natural amenities in respective districts. The negative direct relationship of health services to population development might be due to the age structure of the population or the lack of economic opportunities in respective regions.

The relatively high joblessness in districts with a high share of health services or primary and related production activities translates into negative population developments in respective districts.

Table 61: Significant relations between industrial factors and population development conditional on other industrial factors in remote districts

		Population development							
		Remote							
		Simple production		Primary production	Trade service and food		Recreation service	Health service	
Interaction with	Level	direct	via joblessness	via joblessness	direct	via joblessness	direct	direct	via joblessness
None		-1.592 ** (0.498)	0.763 ** (0.271)	-0.698 * (0.277)	0.704 (0.467)	0.578 * (0.269)	1.715 *** (0.508)	-1.137 ** (0.434)	-0.455 ° (0.252)
Professional service	low	-1.565 * (0.634)	0.998 ** (0.375)	-0.562 * (0.232)	0.510 (0.593)	0.222 (0.315)	2.483 *** (0.714)	-1.690 ** (0.581)	-0.202 (0.314)
	high	-1.619 ° (0.831)	0.528 (0.416)	-0.834 ° (0.468)	0.898 (0.729)	0.934 * (0.433)	0.948 (0.978)	-0.585 (0.772)	-0.708 (0.441)
Simple production	low			-1.056 ** (0.388)	1.204 * (0.546)	0.384 (0.300)	1.426 ** (0.490)	-0.808 (0.554)	-0.870 * (0.350)
	high			-0.340 (0.254)	0.204 (0.616)	0.772 * (0.355)	2.005 ** (0.717)	-1.467 ** (0.563)	-0.040 (0.298)
Primary and related production	low	-1.733 ** (0.630)	0.406 (0.305)		0.884 (0.642)	0.654 ° (0.353)	2.360 ** (0.739)	-1.585 * (0.636)	-0.539 (0.356)
	high	-1.451 ** (0.530)	1.120 ** (0.340)		0.524 (0.461)	0.503 ° (0.266)	1.070 * (0.486)	-0.690 (0.532)	-0.371 (0.294)
Large scale production	low	-2.003 *** (0.560)	0.376 (0.282)	-0.611 ° (0.333)	0.461 (0.586)	0.156 (0.307)	0.534 (0.686)	-0.489 (0.552)	-0.385 (0.301)
	high	-1.181 ° (0.698)	1.149 ** (0.403)	-0.785 * (0.342)	0.947 (0.615)	1.001 ** (0.384)	2.896 *** (0.722)	-1.786 ** (0.554)	-0.525 (0.320)
Trade services and food	low	-1.108 * (0.538)	0.575 * (0.274)	-0.624 ° (0.327)			1.796 * (0.700)	-0.916 (0.610)	-0.661 ° (0.355)
	high	-2.076 ** (0.659)	0.951 * (0.373)	-0.771 * (0.306)			1.634 * (0.650)	-1.359 * (0.539)	-0.249 (0.295)
Recreation service	low	-1.881 *** (0.569)	0.708 * (0.305)	-0.942 * (0.380)	0.787 (0.652)	0.447 (0.355)		-1.266 * (0.536)	-0.348 (0.296)
	high	-1.303 * (0.641)	0.818 * (0.349)	-0.454 (0.295)	0.621 (0.657)	0.710 ◦ (0.375)		-1.009 * (0.457)	-0.562 * (0.272)
Knowledge intensive production	low	-0.952 (0.655)	0.585 ° (0.324)	-0.111 (0.302)	1.378 * (0.597)	0.018 (0.307)	0.874 (0.643)	-1.315 * (0.591)	-0.575 ◦ (0.339)
	high	-2.232 *** (0.608)	0.941 ** (0.360)	-1.284 ** (0.497)	0.030 (0.788)	1.139 * (0.482)	2.556 ** (0.836)	-0.960 (0.610)	-0.335 (0.336)
Health service	low	-1.282 * (0.579)	0.372 (0.284)	-0.777 * (0.354)	0.919 (0.570)	0.378 (0.310)	1.594 ** (0.614)		
	high	-1.902 ** (0.617)	1.154 ** (0.376)	-0.619 ° (0.324)	0.489 (0.618)	0.779 * (0.361)	1.837 *** (0.495)		

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

In central districts, the relatively low joblessness in districts with simple production, primary and related production, recreational services and knowledge-intensive production translates into rather positive population developments (Tables 62). Nevertheless, the positive direct relationship is counteracted by a negative direct relationship with respect to primary and related production and simple production. The same argument with respect to simple production applies as in remote districts. With respect to primary production the observation supports the assumption that it is generally regional traits that explain the socio-economic patterns, in this case specifically the lack of cultural amenities in rural areas, even in rural centers.

Table 62: Significant relations between industrial factors and population development conditional on other industrial factors in central districts

		Population development Central										
Interaction with	Level	Professional service	Simple production		Primary and related production		Trade service and food			Recreation service	Knowledge intense production	
		via taxes	direct	via joblessness	direct	via joblessness	direct	via GDP	via GDP and joblessness	via joblessness	via joblessness	via GDP and joblessness
None		-0.721 * (0.328)	-49.033 ° (29.503)	1.146 *** (0.331)	-1.289 ** (0.421)	1.303 *** (0.351)	0.706 (0.454)	-0.796 ** (0.307)	-0.260 ° (0.135)	1.140 ** (0.414)	0.337 (0.337)	-0.107 (0.097)
Professional service	low		-42.999 (38.145)	1.033 ** (0.383)	-2.013 *** (0.498)	1.332 *** (0.360)	0.643 (0.605)	-0.946 * (0.384)	-0.309 ° (0.165)	1.067 * (0.519)	0.291 (0.364)	0.004 (0.091)
	high		-55.067 (39.430)	1.259 ** (0.409)	-0.565 (0.573)	1.275 ** (0.414)	0.768 (0.547)	-0.646 * (0.305)	-0.212 ° (0.124)	1.214 * (0.550)	0.383 (0.365)	-0.219 (0.136)
Simple production	low	-0.887 * (0.349)			-1.586 ** (0.566)	1.679 *** (0.459)	0.098 (0.496)	-0.628 * (0.285)	-0.206 ° (0.118)	0.901 * (0.376)	0.591 ° (0.350)	-0.080 (0.091)
	high	-0.555 (0.373)			-0.992 ° (0.580)	0.927 * (0.368)	1.313 ° (0.672)	-0.964 * (0.406)	-0.315 ° (0.173)	1.379 * (0.599)	0.083 (0.440)	-0.135 (0.128)
Primary and related production	low	-0.442 ° (0.231)	-69.294 * (33.302)	1.520 *** (0.409)			0.280 (0.528)	-1.110 ** (0.401)	-0.363 * (0.182)	1.301 ** (0.498)	-0.011 (0.294)	-0.089 (0.085)
	high	-1.000 * (0.454)	-28.772 (42.929)	0.772 * (0.387)			1.131 ° (0.640)	-0.482 (0.311)	-0.158 (0.116)	0.980 ° (0.561)	0.685 (0.493)	-0.126 (0.133)
Large scale production	low	-0.651 * (0.320)	-46.993 (33.406)	1.082 ** (0.356)	-1.723 ** (0.543)	1.593 *** (0.439)	0.876 ° (0.514)	-0.344 (0.244)	-0.112 (0.089)	0.941 * (0.452)	0.399 (0.333)	0.009 (0.082)
	high	-0.792 * (0.367)	-51.073 (36.816)	1.210 ** (0.383)	-0.855 ° (0.513)	1.013 ** (0.351)	0.536 (0.526)	-1.249 ** (0.436)	-0.408 * (0.201)	1.340 * (0.565)	0.275 (0.381)	-0.224 (0.141)
Trade services and food	low	-0.817 * (0.361)	-22.246 (33.254)	1.158 ** (0.363)	-1.703 ** (0.553)	1.308 ** (0.404)				1.337 * (0.519)	0.786 * (0.383)	0.019 (0.088)
	high	-0.625 ° (0.346)	-75.820 ° (42.218)	1.133 ** (0.415)	-0.876 (0.556)	1.298 ** (0.405)				0.944 ° (0.484)	-0.112 (0.416)	-0.234 (0.151)
Recreation service	low	-0.104 (0.256)	8.726 (38.755)	0.907 * (0.352)	-1.311 * (0.634)	1.464 ** (0.455)	0.909 (0.596)	-0.577 ° (0.314)	-0.189 (0.122)		0.180 (0.392)	-0.044 (0.100)
	high	-1.339 * (0.565)	-106.791 * (48.068)	1.384 ** (0.503)	-1.268 (0.834)	1.142 * (0.510)	0.502 (0.758)	-1.015 * (0.446)	-0.332 ° (0.186)		0.493 (0.538)	-0.171 (0.155)
Knowledge intensive production	low	-0.783 * (0.355)	-39.163 (37.605)	1.393 *** (0.412)	-1.410 ** (0.538)	0.963 ** (0.356)	0.335 (0.507)	-0.407 ° (0.244)	-0.133 (0.092)	0.988 * (0.461)		
	high	-0.660 * (0.326)	-58.903 (37.316)	0.899 * (0.364)	-1.168 * (0.580)	1.643 *** (0.466)	1.076 ° (0.630)	-1.185 ** (0.448)	-0.388 ° (0.199)	1.293 * (0.579)		
Health service	low	-0.682 * (0.330)	-48.240 (37.072)	1.448 *** (0.422)	-0.930 ° (0.531)	1.110 ** (0.360)	0.718 (0.527)	-0.421 (0.258)	-0.138 (0.097)	0.893 ° (0.484)	0.172 (0.347)	0.036 (0.089)
	high	-0.760 * (0.356)	-49.826 (34.781)	0.843 * (0.333)	-1.649 ** (0.567)	1.496 *** (0.442)	0.693 (0.615)	-1.172 ** (0.441)	-0.383 ° (0.197)	1.387 ** (0.474)	0.501 (0.373)	-0.251 ° (0.147)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Trade service and food-related activities have a negative relationship to population development due to their negative relationship to other economic fundamentals. Nevertheless, there is also a slight positive direct relationship between trade services and population development, specifically in regions with a high share of production activities, possibly due to the convenience that trade services provide to the population in production-oriented regions.

In summary, with respect to population development countervailing direct and indirect relationships to industrial structures are common, specifically in central regions. This underscores the significance of the differentiation between direct and indirect effects. At the same time, joblessness could be identified as an important determinant of population development as it mediates the relation between industry structure and population development in remote as well as in central districts. The direct relations of industrial structures to population developments underscore the important fact that industrial structures go along with important social and cultural implications in addition to their economic characteristics.

6 Synthesis and conclusion

This section collects the conclusions we have drawn with respect to each industry and its relationship to the regions' socio-economic basis conditional upon the district's remoteness and its other industries. Section 6.1 tries to find the general specificities of these relationships with respect to regions' different conditions. Therefore, it collects the summarising conclusions that have been drawn in Chapters 4 and 5 before it provides an attempt for a general synthesis. Afterwards general conclusions are drawn in Section 6.2 with respect to restrictions of the study and its potential value for science and politics. In the concluding section, possible future research and methodological extensions are discussed briefly.

6.1 Synthesis

The industry perspective

Professional services can be important factors for the economy of regions in central and medium locations. They also contribute positively to the regional economy of remote regions, if the latter are characterised by an above average share of industries related to knowledge-intensive production. Otherwise, the productivity of professional services in peripheral regions is rather low, due to lacking agglomeration and specialisation effects.

Simple production tends to contribute to a more equal income distribution. It is rather favourable for regions in medium and remote locations. Nevertheless, in light of rather negative population developments, a shortage of labour might turn out to be a problem for the maintenance of a relatively high level of simple production in remote regions. Moreover, the high labour market participation in regions with a high share of employees in simple production activities does not necessarily imply higher wages. Higher wages are realised in regions with a more diversified industry structure, specifically in the area of professional services.

The gross relationship between a high prevalence of **primary and related production** and population development and the economic situation in terms of other indicators is generally negative in regions of medium location but specifically in those of remote locations. The remarkable exception is the positive relationship to household income in some peripheral regions, depending on accompanying industries. Accordingly, a relatively high share of primary and related production activities is usually a symptom of the lack of an endogenous economic dynamic within a region itself

Dominant firms relate positively to wages in remote regions but at the same time they are negatively related to labour market participation and alternative income opportunities and tax revenues in regions in average locations.

A regional focus on **retail and food production activity** is negatively related to many economic fundamentals, specifically to GDP per inhabitant and wages and thereby also to household income and tax revenues. Nevertheless, if complemented by other industries, trade service and food-related activities potentially contribute to lower unemployment, specifically in remote districts. In districts of medium location a higher prevalence of trade activities is directly positively related to population development. Accordingly, trade service and food-related activities do not seem to introduce a positive dynamic themselves but they can complement other activities in the economy of non-central regions with positive side effects for employment and population development.

Recreational services represent an option that contributes to higher wages only in peripheral regions. On the other hand, they relate to relatively low joblessness in central and medium locations and thereby contribute positively to household income there. Tourism and recreation is positively related to population development but due to different underlying causes: better occupational opportunities in rather central regions and other un-measured amenities related to tourism in rather peripheral regions.

Knowledge-intensive activities are important for medium and remote regions in terms of regional productivity and tax revenues. In remote regions, the positive relation to GDP per inhabitant is conditional on the relative importance of other economic activities, specifically professional services and large scale production. In terms of income distribution, they are mainly of relevance for regions in medium location; here, they go along with a lower unemployment and with a higher household income and are also positively related to population development mediated by the positive economic effects.

A high relative concentration of the **health industry** is negatively related to all income relevant indicators. This result supports the interpretation of the health care industry as a residual activity that shows a relatively high share in economic activity if few occupational alternatives exist.

The economic fundamental perspective

In central districts, **GDP per inhabitant** is positively related to a concentration of professional services in the first instance. In remote districts, knowledge-intensive production is most significantly related to a high regional productivity, but this relationship is conditional on a relatively high share of economic services in the economy. The complementarity between industries seems to be more important in this respect than the concentration of specific industries in remote areas.

Low **joblessness** relates most significantly and unconditionally to simple production activities. Generally, in central regions more industrial types relate to a lower joblessness than in remote districts. With caution, this might be interpreted as a hint of more specialised and mobile labour markets that adapt better to given industry concentrations than in remote districts.

Wage levels, according to the results, are not explained in terms of supply and demand of labour on the regional level, as the relation to industry structure is not mediated by *regional* productivity and joblessness. Instead, wage differences are to be explained by the types of jobs that industries provide and by industry productivity. In central districts the high relevance of concentrated professional services for economic prosperity is underscored by the positive relation to wages. Relative concentration of specific service activities is not necessary for the location of other well paid activities in central districts, therefore these services, due to their low payments, relate negatively to wages. In remote regions, in contrast, recreational services indicate the possible location of other better paid activities. Here, large scale production unconditionally relates to relatively high wages.

In central districts, joblessness is an important mediator for the relation between industrial structure and **household income.** The main direct relationship in central districts is the negative relation between primary production and household income, which indicates a lack of additional income-generating options. The presence and absence of such options is the main explanation for the exclusively direct relationship between industrial structure and household income in remote regions. The direct relations indicate that household incomes in remote areas not only depend on official dependent employment and wages but are significantly determined by other income sources, self-employment and "irregular" labour market participation. The results also underscore the relevance of complementary activities in remote areas.

The relation between **tax revenues** and industrial structure, as expected, is largely mediated via GDP per inhabitant, joblessness and wages. With respect to tax revenues, joblessness is, other than with respect to other economic indicators in remote areas, an important argument. The complementarity between professional services and specific production activities is effective in terms of tax revenues as well. Additionally, knowledge-intensive production is an important positive argument for tax revenues in remote districts. In central districts the indirect effects on tax revenues are even more pronounced. Professional services are unconditionally positively related to tax revenues directly and indirectly in central districts.

With respect to **population development,** countervailing direct and indirect relationships to industrial structures are common, specifically in central regions. This underscores the significance of the differentiation between direct and indirect effects. At the same time, joblessness could be identified as an important determinant of population development as it mediates the relation between industry structure and population development in remote as well as in central districts. The direct relations of industrial structures to population developments underscore the important fact that industrial structures go along with important social and cultural implications in addition to their economic characteristics.

General Synthesis

In the overall view, the analysis reveals that the relationship between the local industrial structure as measured by our factors can be differentiated in direct and indirect effects with the

mediation approach. Sometimes the direct and the indirect relationships take opposite directions, in this case the gross effect might be insignificant. Nevertheless, the information that, for example, the direct relationship of simple production activities to population development is negative while the relationship that is mediated by reduced joblessness is positive is potentially important. It might, for example, help to better prepare policies that address local population decline.

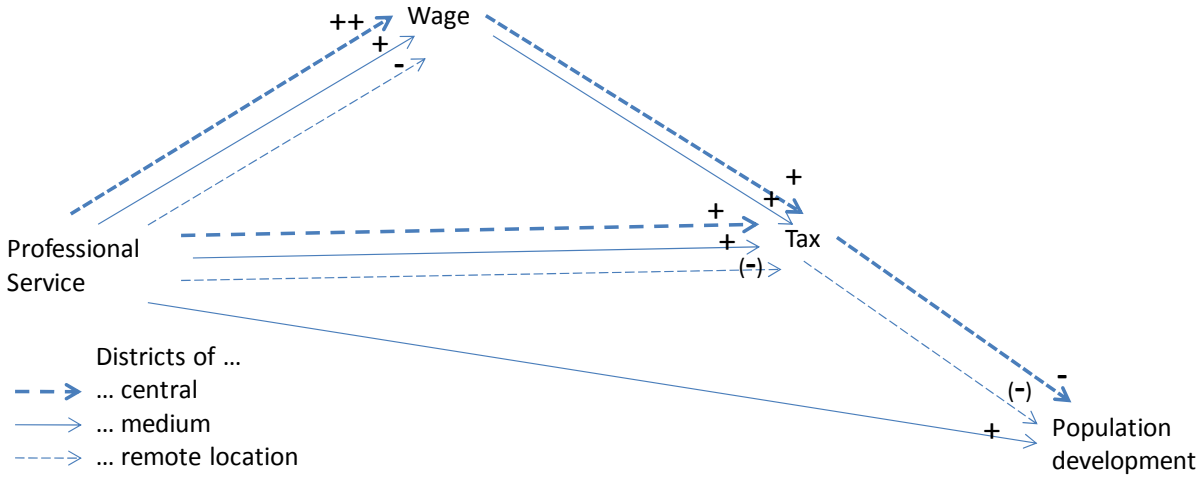
The results also show that direct as well as indirect relationships between specific activities and socio-economic fundamentals are often conditional on a district's remoteness and on the relevance of other industrial factors. It seems to be a robust result that positive relations between economic fundamentals and a high prevalence of specific activities in remote areas often depend on the prevalence of other, complementary activities within the same regions. One example is the dependence of a positive relationship between GDP per inhabitant and the relative abundance of professional services in remote regions upon the complementary abundance of knowledge intensive activities. This may be explained by the sparse markets in remote regions which often do not provide broad enough activities for a high labour market participation or for the generation of sufficiently high multiplier and income effects. In other cases, the productivity of one industry depends on the prevalence of other industries due to an internal differentiation of activities within the same industries. For central regions the reverse effect can sometimes be observed: Here, the positive relation of specific industries to regional productivity, for example, might be stronger, if other activities have a relatively low share. This holds true for professional services in central regions - in contrast to the situation just described for remote regions. Accordingly, agglomeration effects, specifically localisation effects, are relevant for respective industries.

Our results also show the rather complex relationship between activities' relation to regional productivity and their relation to aspects of income distribution, such as labour market participation, household incomes and tax revenues. Large scale production, for example, relates positively to wages in medium and remote regions, but it also relates to a higher joblessness, to lower household income and to lower tax revenues in the same regions. Recreational services, on the other hand, relate negatively to GDP per inhabitant and to wages in central regions, but at the same time go along with a relatively low joblessness. Population development might be negatively related to specific industries, despite of the industries positive effects in terms of labour market participation and household incomes as in the case of simple production activities. Accordingly, one of the most important insights of the study might be that next to productivity, distributional aspects of economic activity are important. The differentiation between direct and indirect effects indirectly reveals that economic activity has potentially many social, cultural and economic dimensions, all of which have an impact in terms of local socio-economic dynamics. Understanding the concrete nature of relations that are not mediated economically necessitates further analyses.

According to the introductory motivation and substantiation of the analysis, there should be a relation between a region's industries' innovation type and the region's productivity and income distribution. For remote districts, the results show that industries that belong to the science-based innovation type (Table 6) relate positive to GDP per inhabitant. For central districts this is not the case (Table 50 and 51). In the light of Pavitt's (1984) substantiation of his industry types (see Chapter 1) one could hypothesis that firms from science based industries in central regions face lower static scale barriers than science based industries in remote regions. At the same time, GDP per inhabitant in central districts relates mainly positively to professional services. Pavitt's taxonomy does not embrace services. Nevertheless, the hypothesis might be put forward that professional services in central regions are either very innovative themselves or contribute to the innovation of the industries they serve. Professional services are also positively related to wage levels in central districts. In remote districts, wages are highest with a high relevance of industries from the specialised supplier type (simple production) and professional services. This supports the notion that professional services are able to support firms' innovative activities, specifically that of specialised suppliers in districts without agglomeration advantages. Joblessness, on the other side, is specifically low in remote districts with a specialised supplier focus and a low share of professional services. It is also low in central regions with a high relevance of specialised suppliers. This positive relation of specialised suppliers to labour market participation rather than to regional productivity is in accordance with Pavitt's considerations (see chapter 1). In conclusion, the results do not contradict the initial motivation of the paper. Nevertheless, obviously much more detailed studies will be necessary in order to reveal the complex relations between industries, firm structure, innovation activities, productivity and income distribution.

Alternative representations of the results might support the understanding of the analysis' complex results. Figure 10 is an alternative representation of selected estimated direct and indirect relations. It shows that professional services' (Tables 11 to 15) positive relation to wages in central and medium districts translates into an indirect positive relation to local tax revenues as well. This indirect effect is paralleled by a direct effect. The direct tax effect is positive for central and medium districts but it is negative for remote districts under specific conditions. According to Table 13, professional services relate directly negative to tax revenues in remote districts if they are accompanied by a low share of simple production or a high share of large scale production. Specifically, the dependence on simple production underlines the complementarity between the two types of activity.

Figure 10: Relation between professional services, wage level, tax revenues and population development in different types of regions



Source: Own figure

Figure 10 also illustrates the opposed direct and indirect relation between professional services and population development. The differentiated relations highlight the complex conditional effects that can be revealed by the moderated mediation model. On the one side, the positive relation between professional services and taxes in central districts translates into an indirect negative relation to population development (Table 15) due to a negative relation between tax revenues and population development in central districts (see Section 3.1 and Table 10). This negative effect of taxes is explainable if one interprets tax revenues as an indicator of the general income level and the related cost of living.

Nevertheless, in remote districts there is a positive relation between tax revenues and population development (see Section 3.1 and Table 10). Apparently in remote districts, not the cost of living aspect but rather the district's relative (public) prosperity is relevant for population dynamics. Due to this reversed relation between tax and population development, the likewise negative relation between professional services and taxes in remote districts translates into an indirect negative effect on population development as in central regions. The important insight is that the observed seemingly consistent estimated gross relations are due to opposed underlying relations. The indirect negative relation between professional services and population development is conditional upon the accompanying industries, just like the direct negative relation to tax revenues that mediated the effect.

Figure 10 finally shows that there also exists a direct positive relation between professional services and population development in districts of medium location. This direct effect is not mediated via regional productivity, joblessness, wages, household income or tax revenues. It therefore hints at the relevance of unmeasured social or cultural traits that are related to the industry and to positive population developments. One possible explanation in the case of

professional service abundance in medium districts is that these services might go along with alternative income sources and occupational alternatives that attract new citizens or allows old citizens to create their own work place and stay. Similar figures that enable the researcher to trace chains of direct and indirect relations may be drawn for different industrial types and different socio-economic indicators as end-points of the chain. These path-diagrams enable the researcher to summarise the complex relations that are otherwise hidden behind gross estimates in simple estimations.

6.2 Conclusion

The analysis generates conceptual/methodological and factual insights. On the factual level, the factors that have been extracted in order to summarise regions' industrial structures are in accordance with the innovation types created by Pavitt (1984). They thereby enable the subsequent results to support the initial argument, i.e., that industrial structure should matter in the determination of regions' prosperity and income distribution due to differences in innovative activities. In the regression analysis it becomes apparent that the relation between local industry-types and socio-economic fundamentals is conditional on regions' remoteness, respectively centrality, and on the specification of accompanying industries. Accordingly, the type of activities or the productivity of activities within specific industry factors differs depending on the density and diversity of local economic activity. Specifically, the complementarity between different industrial activities and thereby the local industry composition seem to gain importance in remote districts' sparse markets. In agglomerated districts, on the contrary, specialisation in professional services contributes to regional productivity due to positive localisation effects.

Not only are the relations conditional on (respectively moderated by) remoteness and industry composition, the results also show the differentiated direct and indirect (respectively mediated) relations to different socio-economic indicators. The importance of distributional effects is underlined, for example, by professional services' relation to wages in remote districts. While professional services here relate positively to GDP per inhabitant if accompanied by knowledge intensive production, they relate negatively to wages under the same conditions. Apparently, under these conditions the majority of jobs is positioned in the low wage segment. Accordingly, while professional services are rather positive for regional productivity in terms of GDP per inhabitant specifically in central regions, they might be judged negatively in terms of income distribution and further socio-economic consequences on tax revenues and population development in remote areas.

On the conceptual level, the results provide different insights as well. Firstly, the different direct relations between tax revenues and population development show that the same variable indicates different phenomena under different conditions. In this case, high tax revenues indicate high public wealth in remote districts and high costs of living in central regions. Secondly, the relation between professional services and population development in remote and central

districts show that seemingly consistent gross relations may be caused by fundamentally different underlying mechanisms and relations: The negative gross relation in central districts is due to a positive tax effect of professional services and a negative population development effect of tax revenues, while the negative gross relation in remote areas is due to a (conditional) negative tax effect of professional services and a positive population development effect of tax revenues. Thirdly, direct and indirect effects are sometimes opposite in direction. In this case, they would cancel out if only the gross effect was estimated, resulting in insignificant estimators. Nevertheless, the existence of two significant net effects is obviously an important information for example for the design of rational policies.

Nevertheless, while the analysis was able to show the complexity of the relationship between industry structure and a region's socio-economic situation, this success also hints at the study's own limitations. The causes at the root of the observed relationships cannot be identified by a simple cross-sectional study. In order to identify causal effects, one would need to apply a panel approach that controls for regionally specific effects and at the same time includes dynamics on the right and left hand side of the equations. Nevertheless, with an fixed effects approach, one is not able to determine the impact of time-invariant effects upon the observations' development. Thereby, the design of a panel model without fixed effects but under inclusion of carefully selected controls might be a way to proceed in the future. The main limitation is in the models' complexity that is already large and difficult to handle due to the moderated mediation approach in the cross-sectional setting.

The important insight that should be gained for future inquiry is that industry structure matters, that it matters in multiple dimensions and that the effects are conditional upon location and multiple dimensions of industry structure. This implies that not only the strategies of empirical inquiry will need to be reconsidered but the theoretical foundation of these inquiries as well. Specifically, the acknowledgement of the different social, economic and cultural dimensions of industry structure and the relevance of distributional effects require careful further developments of theories within the evolutionary economic paradigm.

The results derived from this paper show that industrial structure, firm structure and agglomerations effects matter for local economic development. They thereby show that structural change is an important determinant of regional economic development and create doubt that current economic standard assumptions and related standard policy approaches are appropriate in order to tackle regions' problems effectively. At the same time, the results are far too rough and preliminary in order to inform policies about concrete steps in the support of regional convergence. What remains is the cautious hope that further empirical and theoretical advancements might provide policy with necessary information for the design of effective measures. In the light of the results it can be expected that these advancements probably lead to a much more differentiated, place specific policy approach with large knowledge requirements and high demands concerning the administrative implementation capacity.

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Annex 1

Supplements Chapter 4

List of Tables in ANNEX 1

Table A1: Professional services

Interaction with	Level	Professional service											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		1.627 (1.116)	0.685 (0.525)	-0.256 (1.095)	-2.480 *** (0.485)	-2.115 *** (0.222)	-1.750 *** (0.477)	-0.175 (0.140)	-0.086 (0.068)	0.037 (0.159)	-14.228 (33.778)	34.115 * (13.475)	82.459 ** (31.031)
Simple production	low	4.232 ** (1.522)	1.364 ° (0.703)	-1.505 (1.570)	-2.235 ** (0.678)	-2.262 *** (0.299)	-2.290 *** (0.683)	-0.454 ° (0.248)	-0.171 ° (0.095)	0.217 (0.247)	-8.194 (42.184)	-22.451 (17.323)	-36.707 (41.485)
	high	-0.977 (1.585)	0.007 (0.925)	0.992 (2.157)	-2.725 *** (0.670)	-1.967 *** (0.391)	-1.210 (0.914)	0.105 (0.175)	-0.001 (0.116)	-0.143 (0.318)	-20.262 (42.088)	90.681 *** (21.925)	201.624 *** (51.642)
Primary and related production	low	3.616 ** (1.244)	1.098 (0.675)	-1.420 (1.555)	-3.290 *** (0.544)	-2.111 *** (0.286)	-0.932 (0.667)	-0.388 ° (0.208)	-0.138 (0.089)	0.205 (0.242)	-34.489 (34.637)	39.182 * (16.505)	112.854 ** (38.906)
	high	-0.362 (1.783)	0.273 (0.909)	0.907 (1.177)	-1.670 * (0.759)	-2.119 *** (0.384)	-2.568 *** (0.513)	0.039 (0.192)	-0.034 (0.115)	-0.131 (0.180)	6.033 (47.888)	29.048 (21.714)	52.064 (34.077)
Large scale production	low	0.286 (1.378)	-0.109 (0.637)	-0.505 (1.456)	-2.342 *** (0.586)	-1.603 *** (0.269)	-0.864 (0.617)	-0.031 (0.148)	0.014 (0.080)	0.073 (0.212)	-12.188 (37.776)	36.814 * (15.425)	85.815 * (36.179)
	high	2.968 * (1.408)	1.480 * (0.676)	-0.008 (1.600)	-2.618 *** (0.615)	-2.627 *** (0.288)	-2.636 *** (0.701)	-0.319 (0.200)	-0.186 * (0.093)	0.001 (0.231)	-16.268 (39.818)	31.417 ° (17.192)	79.102 ° (43.015)
Trade services and food	low	2.700 * (1.295)	0.803 (0.688)	-1.095 (1.242)	-2.507 *** (0.576)	-1.913 *** (0.291)	-1.319 * (0.552)	-0.290 (0.183)	-0.101 (0.089)	0.158 (0.193)	12.559 (36.943)	58.854 *** (16.748)	105.149 ** (32.934)
	high	0.554 (1.726)	0.568 (0.645)	0.582 (1.639)	-2.453 *** (0.730)	-2.317 *** (0.273)	-2.181 ** (0.695)	-0.060 (0.187)	-0.071 (0.082)	-0.084 (0.239)	-41.015 (45.436)	9.377 (16.092)	59.768 (42.733)
Recreation service	low	0.646 (1.507)	0.679 (0.731)	0.713 (1.376)	-1.964 ** (0.636)	-1.794 *** (0.314)	-1.624 ** (0.594)	-0.069 (0.164)	-0.085 (0.093)	-0.103 (0.204)	43.530 (40.546)	40.564 * (17.740)	37.598 (36.499)
	high	2.609 (2.030)	0.692 (0.807)	-1.226 (1.576)	-2.996 *** (0.882)	-2.436 *** (0.344)	-1.876 ** (0.675)	-0.280 (0.246)	-0.087 (0.103)	0.177 (0.241)	-71.987 (52.054)	27.666 (19.791)	127.319 ** (40.245)
Knowledge intensive production	low	2.170 (1.439)	1.629 * (0.724)	1.088 (1.584)	-3.015 *** (0.620)	-2.178 *** (0.308)	-1.342 * (0.677)	-0.233 (0.182)	-0.205 * (0.100)	-0.157 (0.239)	-4.358 (40.424)	33.621 ° (17.715)	71.601 ° (40.902)
	high	1.085 (1.572)	-0.258 (0.718)	-1.601 (1.533)	-1.945 ** (0.672)	-2.052 *** (0.303)	-2.159 ** (0.662)	-0.116 (0.175)	0.032 (0.090)	0.231 (0.244)	-24.098 (41.396)	34.609 * (17.447)	93.316 * (39.210)
Health service	low	-2.140 (1.455)	-0.134 (0.654)	1.872 (1.456)	-3.135 *** (0.625)	-1.994 *** (0.276)	-0.853 (0.623)	0.230 (0.183)	0.017 (0.082)	-0.270 (0.243)	-13.435 (41.078)	41.769 ** (16.131)	96.973 ** (37.327)
	high	5.394 *** (1.381)	1.505 * (0.639)	-2.385 ° (1.414)	-1.825 ** (0.606)	-2.236 *** (0.272)	-2.647 *** (0.617)	-0.579 * (0.281)	-0.189 * (0.089)	0.344 (0.256)	-15.021 (37.918)	26.461 ° (15.962)	67.944 ° (38.096)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A1: Professional services – Continued 1

Interaction with	Level	Professional service											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		36.544 (39.453)	48.548 *** (14.208)	60.553 ° (36.170)	13.497 (11.364)	6.980 ° (3.727)	2.449 (6.135)	5.510 (4.750)	2.924 * (1.333)	0.655 (1.280)	3.087 (15.734)	-4.200 (3.635)	-2.748 (4.679)
Simple production	low	40.994 (35.473)	20.996 (19.447)	0.998 (44.959)	28.348 ° (14.973)	9.532 ° (5.134)	0.173 (3.680)	11.574 ° (6.476)	3.993 * (1.842)	0.046 (0.981)	-2.225 (13.960)	-2.351 (4.948)	-0.922 (3.206)
	high	32.094 (54.039)	76.101 *** (19.751)	120.108 * (52.170)	-1.354 (14.013)	4.428 (3.844)	4.726 (11.301)	-0.553 (5.722)	1.855 (1.526)	1.264 (2.282)	8.398 (22.568)	-6.049 (4.978)	-4.575 (7.602)
Primary and related production	low	27.301 (30.262)	18.150 (16.885)	8.998 (45.797)	32.243 * (15.988)	10.980 * (5.287)	0.331 (3.881)	13.164 ° (6.966)	4.600 * (1.809)	0.088 (1.028)	4.423 (12.588)	-1.864 (4.282)	-1.696 (3.933)
	high	45.787 (54.739)	78.947 *** (23.000)	112.108 * (45.589)	-5.249 (13.488)	2.980 (4.219)	4.568 (10.728)	-2.143 (5.521)	1.248 (1.733)	1.221 (2.136)	1.750 (21.339)	-6.536 (5.853)	-3.801 (6.341)
Large scale production	low	53.467 (40.505)	62.635 ** (19.646)	71.803 (52.105)	1.696 (9.973)	8.017 ° (4.655)	7.229 (16.459)	0.692 (4.074)	3.358 * (1.712)	1.933 (3.192)	11.517 (16.382)	4.938 (4.984)	0.869 (3.630)
	high	19.621 (45.122)	34.462 (22.360)	49.303 (48.597)	25.299 (15.934)	5.943 (4.556)	-2.331 (6.595)	10.329 (6.779)	2.490 (1.779)	-0.623 (1.468)	-5.344 (18.487)	-13.338 * (6.213)	-6.365 (9.962)
Trade services and food	low	8.569 (42.723)	54.626 ** (19.433)	100.682 * (44.120)	8.046 (11.250)	8.981 ° (4.934)	6.132 (13.991)	3.285 (4.633)	3.762 * (1.783)	1.640 (2.719)	2.105 (17.315)	-9.439 ° (5.209)	-5.423 (8.528)
	high	64.518 (46.317)	42.471 * (18.552)	20.424 (47.120)	18.948 (14.383)	4.979 (3.866)	-1.234 (4.776)	7.736 (6.043)	2.086 (1.512)	-0.330 (1.168)	4.068 (18.962)	1.039 (4.687)	-0.074 (3.101)
Recreation service	low	92.157 * (40.939)	66.214 ** (22.434)	40.271 (55.576)	15.377 (12.349)	9.433 ° (5.490)	4.226 (10.384)	6.278 (5.173)	3.952 ° (2.021)	1.130 (2.139)	-0.358 (16.617)	-6.619 (5.836)	-3.516 (6.335)
	high	-19.069 (63.653)	30.883 (23.474)	80.835 (53.733)	11.618 (17.359)	4.527 (4.490)	0.673 (4.808)	4.743 (7.141)	1.897 (1.806)	0.180 (1.254)	6.531 (26.907)	-1.782 (5.803)	-1.980 (4.654)
Knowledge intensive production	low	37.138 (42.784)	18.116 (20.785)	-0.907 (49.869)	25.985 (15.798)	-0.549 (3.730)	-8.844 (19.917)	10.609 (6.741)	-0.230 (1.561)	-2.365 (3.825)	0.988 (17.735)	-1.793 (5.253)	-1.122 (3.729)
	high	35.949 (41.434)	78.981 *** (20.322)	122.013 * (52.529)	1.009 (9.975)	14.510 * (6.771)	13.742 (30.568)	0.412 (4.073)	6.078 ** (2.279)	3.674 (5.800)	5.186 (16.138)	-6.607 (5.274)	-4.375 (7.330)
Health service	low	70.518 ° (41.128)	63.602 *** (17.555)	56.685 (44.457)	7.555 (10.901)	-2.214 (3.259)	-4.562 (10.711)	3.084 (4.487)	-0.927 (1.341)	-1.220 (2.132)	-5.753 (16.899)	-3.334 (4.470)	-0.902 (3.240)
	high	2.569 (44.019)	33.495 ° (19.858)	64.421 (49.593)	19.440 (13.788)	16.174 * (7.290)	9.461 (21.232)	7.936 (5.817)	6.775 ** (2.405)	2.530 (4.064)	11.926 (17.734)	-5.066 (5.072)	-4.594 (7.531)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A1: Professional services – Continued 2

Interaction with	Level	Professional service														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		85.650 ** (28.804)	30.211 ** (10.509)	-25.227 (27.059)	1.036 (5.307)	-3.616 (3.107)	-11.623 (10.259)	0.674 (3.445)	-0.598 (0.544)	-0.183 (0.423)	36.760 * (14.319)	6.469 * (2.963)	-13.432 (10.163)	7.980 (9.099)	6.915 * (2.801)	4.026 (6.760)
Simple production	low	105.366 *** (25.860)	2.536 (14.073)	-100.294 ** (32.713)	-0.747 (4.701)	-2.024 (4.255)	-3.899 (12.313)	-0.486 (3.054)	-0.335 (0.711)	-0.061 (0.234)	38.021 ** (14.163)	-3.230 (3.697)	-29.381 (20.340)	8.952 (8.414)	2.991 (2.894)	0.066 (2.991)
	high	65.934 ° (39.343)	57.887 *** (14.728)	49.840 (39.092)	2.819 (7.708)	-5.208 (4.252)	-19.347 (15.504)	1.834 (4.974)	-0.862 (0.749)	-0.304 (0.695)	35.498 * (16.288)	16.168 ** (4.972)	2.518 (7.624)	7.008 (12.078)	10.839 ** (4.138)	7.986 (13.003)
Primary and related production	low	52.542 * (22.153)	15.443 (12.316)	-21.656 (33.734)	1.485 (4.292)	-1.605 (3.683)	-7.172 (12.948)	0.966 (2.772)	-0.266 (0.614)	-0.113 (0.316)	25.366 * (10.486)	3.552 (3.245)	-10.692 (9.645)	5.962 (6.961)	2.585 (2.512)	0.598 (3.187)
	high	118.758 ** (39.828)	44.980 ** (16.911)	-28.799 (33.870)	0.587 (7.169)	-5.628 (5.006)	-16.073 (13.101)	0.382 (4.662)	-0.931 (0.873)	-0.253 (0.579)	48.153 * (18.987)	9.386 * (4.665)	-16.171 (12.363)	9.999 (12.504)	11.245 * (4.543)	7.454 (12.083)
Large scale production	low	77.254 ** (29.737)	53.354 *** (14.529)	29.454 (38.801)	3.866 (5.836)	4.252 (4.269)	3.674 (14.389)	2.515 (3.694)	0.703 (0.737)	0.058 (0.258)	36.152 * (14.288)	8.211 * (4.054)	-10.324 (9.970)	11.676 (9.828)	8.921 * (3.751)	4.774 (8.254)
	high	94.047 ** (32.737)	7.069 (16.213)	-79.908 * (35.408)	-1.794 (6.272)	-11.484 * (5.217)	-26.920 ° (15.471)	-1.167 (4.060)	-1.900 ° (1.033)	-0.423 (0.938)	37.367 * (15.343)	4.728 (4.258)	-16.539 (12.944)	4.285 (9.978)	4.909 (3.469)	3.278 (6.075)
Trade services and food	low	97.026 ** (30.882)	32.592 * (14.295)	-31.841 (32.447)	0.707 (5.823)	-8.127 ° (4.406)	-22.933 ° (13.646)	0.460 (3.785)	-1.344 (0.832)	-0.361 (0.801)	34.039 * (14.121)	7.789 * (3.969)	-9.629 (8.885)	1.871 (9.355)	7.780 * (3.522)	6.695 (10.907)
	high	74.275 * (34.207)	27.831 * (13.524)	-18.614 (35.097)	1.366 (6.402)	0.894 (4.034)	-0.313 (13.105)	0.888 (4.153)	0.148 (0.669)	-0.005 (0.206)	39.481 * (16.028)	5.149 (3.622)	-17.235 (13.164)	14.089 (11.359)	6.049 ° (3.139)	1.358 (3.789)
Recreation service	low	12.307 (30.195)	-6.897 (16.486)	-26.100 (41.067)	-0.120 (5.578)	-5.699 (4.990)	-14.871 (15.789)	-0.078 (3.629)	-0.943 (0.872)	-0.234 (0.559)	31.280 * (13.215)	3.382 (4.254)	-14.744 (12.411)	20.125 ° (11.595)	9.431 * (4.145)	2.678 (5.596)
	high	158.993 *** (46.071)	67.320 *** (17.019)	-24.354 (39.222)	2.192 (9.100)	-1.534 (4.994)	-8.375 (15.451)	1.426 (5.899)	-0.254 (0.830)	-0.132 (0.372)	42.239 * (19.439)	9.556 * (4.743)	-12.119 (11.160)	-4.164 (13.984)	4.399 (3.563)	5.375 (9.159)
Knowledge intensive production	low	92.966 ** (31.056)	14.726 (15.027)	-63.513 ° (36.112)	0.332 (5.956)	-1.544 (4.520)	-4.744 (14.179)	0.216 (3.874)	-0.255 (0.752)	-0.075 (0.274)	27.680 * (12.799)	5.423 (4.036)	-9.253 (9.414)	8.110 (9.805)	2.580 (3.047)	-0.060 (3.317)
	high	78.335 * (30.401)	45.697 ** (15.229)	13.059 (39.695)	1.741 (5.488)	-5.689 (4.503)	-18.502 (15.352)	1.132 (3.548)	-0.941 (0.796)	-0.291 (0.668)	45.839 ** (16.880)	7.516 ° (4.104)	-17.610 (13.748)	7.850 (9.495)	11.250 ** (4.278)	8.113 (13.201)
Health service	low	81.019 ** (30.288)	10.707 (12.903)	-59.605 ° (32.668)	-1.931 (5.756)	-2.871 (3.837)	-3.816 (12.524)	-1.256 (3.719)	-0.475 (0.650)	-0.060 (0.235)	27.784 * (12.496)	5.193 (3.442)	-9.679 (8.991)	15.399 (10.611)	9.059 * (3.562)	3.769 (6.612)
	high	90.282 ** (31.905)	49.716 *** (14.616)	9.150 (36.720)	4.003 (6.287)	-4.362 (4.344)	-19.430 (14.641)	2.604 (3.989)	-0.722 (0.750)	-0.305 (0.693)	45.735 ** (17.226)	7.746 ° (4.041)	-17.184 (13.293)	0.561 (9.615)	4.771 (3.128)	4.284 (7.487)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A1: Professional services – Continued 3

Interaction with	Level	Professional service														
		Tax via GDP			Tax via GDP and joblessness			Tax via GDP and wages			Tax via GDP and household income			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		18.611 (14.027)	15.430 ** (5.854)	11.782 (14.605)	1.850 (1.848)	2.518 * (1.118)	2.770 (3.611)	1.547 (1.756)	4.317 * (1.844)	4.317 (5.927)	2.947 (2.707)	0.994 ° (0.599)	0.163 (0.481)	1.203 (1.127)	0.416 ° (0.223)	0.044 (0.109)
Simple production	low	39.088 ** (14.535)	21.071 ** (8.132)	0.832 (17.609)	3.885 (2.930)	3.438 * (1.546)	0.195 (4.140)	3.249 (3.011)	5.895 * (2.553)	0.305 (6.454)	6.190 (3.981)	1.358 (0.824)	0.011 (0.245)	2.527 (1.691)	0.569 ° (0.307)	0.003 (0.065)
	high	-1.867 (19.310)	9.789 (7.661)	22.733 (22.506)	-0.186 (1.923)	1.597 (1.303)	5.344 (5.714)	-0.155 (1.610)	2.739 (2.210)	8.329 (9.601)	-0.296 (3.062)	0.631 (0.575)	0.314 (0.899)	-0.121 (1.250)	0.264 (0.230)	0.084 (0.201)
Primary and related production	low	44.459 ** (14.418)	24.273 *** (7.309)	1.592 (18.346)	4.419 (3.234)	3.960 ** (1.503)	0.374 (4.315)	3.696 (3.358)	6.791 ** (2.442)	0.583 (6.730)	7.041 (4.343)	1.564 ° (0.871)	0.022 (0.260)	2.875 (1.851)	0.655 * (0.316)	0.006 (0.069)
	high	-7.237 (18.399)	6.587 (8.992)	21.973 (19.378)	-0.719 (1.889)	1.075 (1.488)	5.165 (5.010)	-0.602 (1.612)	1.843 (2.542)	8.051 (8.544)	-1.146 (2.975)	0.424 (0.613)	0.304 (0.858)	-0.468 (1.218)	0.178 (0.252)	0.081 (0.191)
Large scale production	low	2.338 (13.724)	17.722 * (7.846)	34.778 (23.200)	0.232 (1.372)	2.892 * (1.444)	8.175 (6.376)	0.194 (1.153)	4.958 * (2.402)	12.742 (11.351)	0.370 (2.182)	1.142 (0.736)	0.481 (1.329)	0.151 (0.891)	0.478 ° (0.278)	0.129 (0.293)
	high	34.884 * (17.648)	13.138 (8.778)	-11.213 (20.265)	3.467 (2.872)	2.144 (1.515)	-2.636 (4.881)	2.900 (2.865)	3.675 (2.560)	-4.108 (7.811)	5.525 (4.027)	0.847 (0.691)	-0.155 (0.501)	2.255 (1.696)	0.355 (0.272)	-0.041 (0.117)
Trade services and food	low	11.094 (14.943)	19.853 * (7.959)	29.501 (20.157)	1.103 (1.652)	3.239 * (1.499)	6.934 (5.505)	0.922 (1.468)	5.554 * (2.480)	10.809 (9.760)	1.757 (2.540)	1.279 (0.789)	0.408 (1.129)	0.717 (1.045)	0.536 ° (0.295)	0.109 (0.249)
	high	26.127 (17.241)	11.007 (7.478)	-5.936 (18.997)	2.597 (2.416)	1.796 (1.289)	-1.395 (4.501)	2.172 (2.335)	3.079 (2.178)	-2.175 (7.078)	4.138 (3.489)	0.709 (0.585)	-0.082 (0.343)	1.689 (1.458)	0.297 (0.231)	-0.022 (0.085)
Recreation service	low	21.203 (15.056)	20.852 * (9.270)	20.328 (23.183)	2.107 (2.037)	3.402 * (1.704)	4.778 (5.781)	1.762 (1.950)	5.834 * (2.836)	7.448 (9.564)	3.358 (2.965)	1.344 (0.868)	0.281 (0.819)	1.371 (1.237)	0.563 ° (0.328)	0.075 (0.185)
	high	16.019 (23.169)	10.008 (9.186)	3.237 (22.032)	1.592 (2.529)	1.633 (1.545)	0.761 (5.188)	1.332 (2.233)	2.800 (2.628)	1.186 (8.103)	2.537 (3.903)	0.645 (0.665)	0.045 (0.327)	1.036 (1.605)	0.270 (0.268)	0.012 (0.085)
Knowledge intensive production	low	35.830 * (17.142)	-1.214 (8.233)	-42.545 ° (24.568)	3.561 (2.891)	-0.198 (1.344)	-10.001 (7.049)	2.978 (2.902)	-0.340 (2.304)	-15.588 (12.873)	5.674 (4.029)	-0.078 (0.532)	-0.588 (1.614)	2.317 (1.700)	-0.033 (0.223)	-0.157 (0.354)
	high	1.392 (13.744)	32.074 *** (8.880)	66.110 * (30.239)	0.138 (1.369)	5.233 ** (1.886)	15.540 (9.485)	0.116 (1.147)	8.973 ** (3.047)	24.222 (18.089)	0.220 (2.180)	2.067 ° (1.125)	0.914 (2.487)	0.090 (0.890)	0.866 * (0.405)	0.244 (0.544)
Health service	low	10.417 (14.515)	-4.893 (6.966)	-21.948 (19.295)	1.035 (1.595)	-0.798 (1.151)	-5.159 (4.992)	0.866 (1.413)	-1.369 (1.967)	-8.041 (8.515)	1.650 (2.456)	-0.315 (0.473)	-0.303 (0.857)	0.674 (1.011)	-0.132 (0.195)	-0.081 (0.191)
	high	26.804 ° (16.136)	35.753 *** (8.904)	45.512 ° (24.849)	2.664 (2.372)	5.834 ** (1.981)	10.698 (7.267)	2.228 (2.318)	10.002 ** (3.173)	16.675 (13.409)	4.245 (3.390)	2.304 ° (1.222)	0.629 (1.723)	1.733 (1.421)	0.965 * (0.436)	0.168 (0.378)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A1: Professional services – Continued 4

Interaction with	Level	Professional service											
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.497 (0.656)	0.668 ** (0.239)	0.839 (0.610)	0.357 (0.278)	0.030 (0.051)	-0.160 (0.214)	0.117 (0.100)	0.104 * (0.044)	0.084 (0.109)	-0.157 (0.128)	0.002 (0.019)	0.103 (0.133)
Simple production	low	1.070 ° (0.597)	0.968 ** (0.318)	0.866 (0.745)	0.750 * (0.315)	0.040 (0.070)	-0.011 (0.239)	0.245 ° (0.134)	0.142 * (0.061)	0.006 (0.126)	-0.329 * (0.159)	0.003 (0.026)	0.007 (0.153)
	high	-0.076 (0.896)	0.368 (0.340)	0.812 (0.882)	-0.036 (0.371)	0.019 (0.035)	-0.308 (0.343)	-0.012 (0.121)	0.066 (0.053)	0.162 (0.172)	0.016 (0.163)	0.001 (0.012)	0.198 (0.210)
Primary and related production	low	-0.221 (0.503)	0.420 (0.278)	1.061 (0.760)	0.853 ** (0.323)	0.046 (0.079)	-0.022 (0.249)	0.279 ° (0.144)	0.164 ** (0.057)	0.011 (0.131)	-0.374 * (0.167)	0.004 (0.030)	0.014 (0.160)
	high	1.214 (0.910)	0.916 * (0.384)	0.617 (0.764)	-0.139 (0.354)	0.013 (0.027)	-0.298 (0.303)	-0.045 (0.117)	0.044 (0.061)	0.157 (0.150)	0.061 (0.156)	0.001 (0.008)	0.191 (0.184)
Large scale production	low	0.108 (0.680)	0.506 (0.333)	0.904 (0.879)	0.045 (0.263)	0.034 (0.059)	-0.472 (0.394)	0.015 (0.086)	0.120 * (0.057)	0.248 (0.191)	-0.020 (0.116)	0.003 (0.022)	0.303 (0.233)
	high	0.885 (0.745)	0.830 * (0.365)	0.775 (0.805)	0.669 ° (0.363)	0.025 (0.046)	0.152 (0.285)	0.219 (0.141)	0.089 (0.061)	-0.080 (0.148)	-0.294 ° (0.174)	0.002 (0.016)	-0.098 (0.180)
Trade services and food	low	0.437 (0.705)	0.545 ° (0.324)	0.652 (0.731)	0.213 (0.290)	0.038 (0.066)	-0.400 (0.340)	0.070 (0.098)	0.134 * (0.059)	0.210 (0.165)	-0.093 (0.129)	0.003 (0.025)	0.257 (0.201)
	high	0.557 (0.775)	0.791 ** (0.306)	1.026 (0.790)	0.501 (0.345)	0.021 (0.038)	0.081 (0.261)	0.164 (0.127)	0.074 (0.052)	-0.042 (0.136)	-0.220 (0.160)	0.002 (0.014)	-0.052 (0.167)
Recreation service	low	0.611 (0.693)	1.106 ** (0.371)	1.601 ° (0.940)	0.407 (0.300)	0.040 (0.069)	-0.276 (0.344)	0.133 (0.108)	0.141 * (0.068)	0.145 (0.174)	-0.179 (0.138)	0.003 (0.026)	0.177 (0.213)
	high	0.383 (1.056)	0.230 (0.392)	0.077 (0.893)	0.307 (0.449)	0.019 (0.037)	-0.044 (0.300)	0.101 (0.151)	0.068 (0.063)	0.023 (0.157)	-0.135 (0.199)	0.001 (0.012)	0.028 (0.192)
Knowledge intensive production	low	-0.101 (0.707)	0.748 * (0.340)	1.598 ° (0.819)	0.688 ° (0.355)	-0.002 (0.016)	0.577 (0.442)	0.225 (0.140)	-0.008 (0.056)	-0.303 (0.210)	-0.302 ° (0.171)	0.000 (0.002)	-0.371 (0.256)
	high	1.095 (0.692)	0.588 ° (0.348)	0.080 (0.899)	0.027 (0.264)	0.061 (0.105)	-0.897 (0.610)	0.009 (0.086)	0.217 ** (0.071)	0.471 ° (0.281)	-0.012 (0.116)	0.005 (0.040)	0.576 (0.342)
Health service	low	0.670 (0.688)	0.496 ° (0.291)	0.322 (0.739)	0.200 (0.281)	-0.009 (0.021)	0.298 (0.302)	0.065 (0.095)	-0.033 (0.047)	-0.156 (0.150)	-0.088 (0.125)	-0.001 (0.006)	-0.191 (0.183)
	high	0.324 (0.727)	0.840 * (0.334)	1.357 (0.828)	0.514 (0.326)	0.068 (0.116)	-0.617 (0.459)	0.168 (0.122)	0.242 ** (0.074)	0.324 (0.216)	-0.226 (0.152)	0.005 (0.044)	0.397 (0.264)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A1: Professional services – Continued 5

Interaction with	Level	Professional service											
		Population development via joblessness			Population development via wages			Population development via wages and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.065 (0.333)	-0.150 (0.127)	-0.352 (0.308)	-0.193 (0.287)	0.035 (0.035)	-0.297 (0.236)	-0.310 * (0.153)	0.001 (0.008)	-0.117 (0.099)	-0.721 * (0.328)	0.004 (0.037)	-0.220 (0.250)
Simple production	low	-0.047 (0.296)	-0.084 (0.176)	-0.118 (0.373)	-0.200 (0.296)	-0.018 (0.025)	-0.650 (0.476)	-0.320 * (0.154)	0.000 (0.004)	-0.256 (0.202)	-0.887 * (0.349)	0.000 (0.004)	-0.874 * (0.437)
	high	0.178 (0.478)	-0.216 (0.173)	-0.587 (0.464)	-0.187 (0.281)	0.088 (0.082)	0.056 (0.169)	-0.299 ° (0.165)	0.002 (0.020)	0.022 (0.067)	-0.555 (0.373)	0.008 (0.072)	0.434 (0.378)
Primary and related production	low	0.094 (0.267)	-0.066 (0.152)	-0.218 (0.392)	-0.133 (0.199)	0.019 (0.025)	-0.237 (0.221)	-0.214 ° (0.110)	0.001 (0.004)	-0.093 (0.091)	-0.442 ° (0.231)	0.002 (0.019)	-0.189 (0.303)
	high	0.037 (0.452)	-0.233 (0.204)	-0.487 (0.392)	-0.253 (0.376)	0.051 (0.052)	-0.358 (0.286)	-0.406 * (0.203)	0.001 (0.012)	-0.141 (0.120)	-1.000 * (0.454)	0.007 (0.056)	-0.251 (0.310)
Large scale production	low	0.244 (0.346)	0.176 (0.175)	0.111 (0.436)	-0.190 (0.282)	0.045 (0.045)	-0.228 (0.227)	-0.304 * (0.152)	0.001 (0.010)	-0.090 (0.093)	-0.651 * (0.320)	0.008 (0.066)	0.257 (0.352)
	high	-0.113 (0.392)	-0.475 * (0.205)	-0.816 ° (0.456)	-0.196 (0.293)	0.026 (0.032)	-0.366 (0.299)	-0.315 ° (0.161)	0.001 (0.006)	-0.144 (0.125)	-0.792 * (0.367)	0.001 (0.009)	-0.696 ° (0.406)
Trade services and food	low	0.045 (0.367)	-0.336 ° (0.176)	-0.695 ° (0.403)	-0.179 (0.267)	0.042 (0.043)	-0.213 (0.203)	-0.287 ° (0.148)	0.001 (0.010)	-0.084 (0.084)	-0.817 * (0.361)	0.005 (0.040)	-0.277 (0.302)
	high	0.086 (0.402)	0.037 (0.167)	-0.009 (0.397)	-0.208 (0.309)	0.028 (0.032)	-0.381 (0.305)	-0.332 * (0.169)	0.001 (0.006)	-0.150 (0.128)	-0.625 ° (0.346)	0.004 (0.034)	-0.162 (0.312)
Recreation service	low	-0.008 (0.352)	-0.236 (0.204)	-0.451 (0.475)	-0.164 (0.246)	0.018 (0.028)	-0.326 (0.285)	-0.263 ° (0.138)	0.000 (0.004)	-0.128 (0.119)	-0.104 (0.256)	-0.001 (0.009)	-0.227 (0.368)
	high	0.138 (0.570)	-0.064 (0.207)	-0.254 (0.467)	-0.222 (0.334)	0.052 (0.053)	-0.268 (0.255)	-0.356 ° (0.197)	0.001 (0.012)	-0.106 (0.105)	-1.339 * (0.565)	0.010 (0.083)	-0.212 (0.351)
Knowledge intensive production	low	0.021 (0.376)	-0.064 (0.187)	-0.144 (0.430)	-0.145 (0.219)	0.029 (0.034)	-0.205 (0.214)	-0.233 ° (0.129)	0.001 (0.007)	-0.081 (0.088)	-0.783 * (0.355)	0.002 (0.018)	-0.553 (0.378)
	high	0.110 (0.342)	-0.236 (0.183)	-0.561 (0.459)	-0.241 (0.356)	0.041 (0.042)	-0.390 (0.318)	-0.386 * (0.185)	0.001 (0.009)	-0.153 (0.133)	-0.660 * (0.326)	0.007 (0.057)	0.114 (0.349)
Health service	low	-0.122 (0.358)	-0.119 (0.158)	-0.116 (0.379)	-0.146 (0.219)	0.028 (0.031)	-0.214 (0.205)	-0.234 ° (0.127)	0.001 (0.006)	-0.084 (0.085)	-0.682 * (0.330)	0.002 (0.013)	-0.519 (0.346)
	high	0.253 (0.375)	-0.181 (0.178)	-0.589 (0.437)	-0.240 (0.356)	0.042 (0.043)	-0.380 (0.308)	-0.385 * (0.187)	0.001 (0.010)	-0.150 (0.129)	-0.760 * (0.356)	0.007 (0.062)	0.080 (0.321)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A2: Simple production

Interaction with	Level	Simple Production											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		1.627 (1.116)	0.685 (0.525)	-0.256 (1.095)	-2.480 *** (0.485)	-2.115 *** (0.222)	-1.750 *** (0.477)	-0.175 (0.140)	-0.086 (0.068)	0.037 (0.159)	-14.228 (33.778)	34.115 * (13.475)	82.459 ** (31.031)
Professional service	low	4.232 ** (1.522)	1.364 ° (0.703)	-1.505 (1.570)	-2.235 ** (0.678)	-2.262 *** (0.299)	-2.290 *** (0.683)	-0.454 ° (0.248)	-0.171 ° (0.095)	0.217 (0.247)	-8.194 (42.184)	-22.451 (17.323)	-36.707 (41.485)
	high	-0.977 (1.585)	0.007 (0.925)	0.992 (2.157)	-2.725 *** (0.670)	-1.967 *** (0.391)	-1.210 (0.914)	0.105 (0.175)	-0.001 (0.116)	-0.143 (0.318)	-20.262 (42.088)	90.681 *** (21.925)	201.624 *** (51.642)
Primary and related production	low	3.616 ** (1.244)	1.098 (0.675)	-1.420 (1.555)	-3.290 *** (0.544)	-2.111 *** (0.286)	-0.932 (0.667)	-0.388 ° (0.208)	-0.138 (0.089)	0.205 (0.242)	-34.489 (34.637)	39.182 * (16.505)	112.854 ** (38.906)
	high	-0.362 (1.783)	0.273 (0.909)	0.907 (1.177)	-1.670 * (0.759)	-2.119 *** (0.384)	-2.568 *** (0.513)	0.039 (0.192)	-0.034 (0.115)	-0.131 (0.180)	6.033 (47.888)	29.048 (21.714)	52.064 (34.077)
Large scale production	low	0.286 (1.378)	-0.109 (0.637)	-0.505 (1.456)	-2.342 *** (0.586)	-1.603 *** (0.269)	-0.864 (0.617)	-0.031 (0.148)	0.014 (0.080)	0.073 (0.212)	-12.188 (37.776)	36.814 * (15.425)	85.815 * (36.179)
	high	2.968 * (1.408)	1.480 * (0.676)	-0.008 (1.600)	-2.618 *** (0.615)	-2.627 *** (0.288)	-2.636 *** (0.701)	-0.319 (0.200)	-0.186 * (0.093)	0.001 (0.231)	-16.268 (39.818)	31.417 ° (17.192)	79.102 ° (43.015)
Trade services and food	low	2.700 * (1.295)	0.803 (0.688)	-1.095 (1.242)	-2.507 *** (0.576)	-1.913 *** (0.291)	-1.319 * (0.552)	-0.290 (0.183)	-0.101 (0.089)	0.158 (0.193)	12.559 (36.943)	58.854 *** (16.748)	105.149 ** (32.934)
	high	0.554 (1.726)	0.568 (0.645)	0.582 (1.639)	-2.453 *** (0.730)	-2.317 *** (0.273)	-2.181 ** (0.695)	-0.060 (0.187)	-0.071 (0.082)	-0.084 (0.239)	-41.015 (45.436)	9.377 (16.092)	59.768 (42.733)
Recreation service	low	0.646 (1.507)	0.679 (0.731)	0.713 (1.376)	-1.964 ** (0.636)	-1.794 *** (0.314)	-1.624 ** (0.594)	-0.069 (0.164)	-0.085 (0.093)	-0.103 (0.204)	43.530 (40.546)	40.564 * (17.740)	37.598 (36.499)
	high	2.609 (2.030)	0.692 (0.807)	-1.226 (1.576)	-2.996 *** (0.882)	-2.436 *** (0.344)	-1.876 ** (0.675)	-0.280 (0.246)	-0.087 (0.103)	0.177 (0.241)	-71.987 (52.054)	27.666 (19.791)	127.319 ** (40.245)
Knowledge intensive production	low	2.170 (1.439)	1.629 * (0.724)	1.088 (1.584)	-3.015 *** (0.620)	-2.178 *** (0.308)	-1.342 * (0.677)	-0.233 (0.182)	-0.205 * (0.100)	-0.157 (0.239)	-4.358 (40.424)	33.621 ° (17.715)	71.601 ° (40.902)
	high	1.085 (1.572)	-0.258 (0.718)	-1.601 (1.533)	-1.945 ** (0.672)	-2.052 *** (0.303)	-2.159 ** (0.662)	-0.116 (0.175)	0.032 (0.090)	0.231 (0.244)	-24.098 (41.396)	34.609 * (17.447)	93.316 * (39.210)
Health service	low	-2.140 (1.455)	-0.134 (0.654)	1.872 (1.456)	-3.135 *** (0.625)	-1.994 *** (0.276)	-0.853 (0.623)	0.230 (0.183)	0.017 (0.082)	-0.270 (0.243)	-13.435 (41.078)	41.769 ** (16.131)	96.973 ** (37.327)
	high	5.394 *** (1.381)	1.505 * (0.639)	-2.385 ° (1.414)	-1.825 ** (0.606)	-2.236 *** (0.272)	-2.647 *** (0.617)	-0.579 * (0.281)	-0.189 * (0.089)	0.344 (0.256)	-15.021 (37.918)	26.461 ° (15.962)	67.944 ° (38.096)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A2: Simple production – Continued 1

Interaction with	Level	Simple Production											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.737 (32.040)	49.080 *** (12.496)	80.513 ** (29.043)	9.322 (7.609)	2.591 (2.238)	-0.470 (2.257)	3.806 (3.185)	1.085 (0.888)	-0.126 (0.570)	54.041 ** (16.968)	26.639 *** (6.158)	5.948 (8.949)
Professional service	low	6.771 (40.139)	21.398 (15.968)	20.679 (38.327)	24.243 ° (13.822)	5.155 (3.358)	-2.757 (6.718)	9.897 ° (5.932)	2.160 ° (1.272)	-0.737 (1.375)	48.705 * (19.009)	28.497 *** (6.970)	7.783 (11.747)
	high	-5.298 (41.363)	76.762 *** (20.624)	140.348 ** (48.626)	-5.599 (9.412)	0.027 (3.497)	1.817 (5.625)	-2.286 (3.866)	0.011 (1.465)	0.486 (1.297)	59.378 ** (20.628)	24.781 *** (7.093)	4.113 (6.833)
Primary and related production	low	-19.525 (35.569)	95.871 *** (15.343)	111.120 ** (36.525)	20.716 ° (11.608)	4.151 (3.040)	-2.602 (6.399)	8.457 ° (4.990)	1.739 (1.178)	-0.696 (1.319)	71.687 *** (21.224)	26.585 *** (6.552)	3.167 (5.205)
	high	20.998 (44.710)	2.289 (20.052)	49.907 (31.522)	-2.071 (10.255)	1.031 (3.462)	1.662 (4.247)	-0.846 (4.190)	0.432 (1.445)	0.444 (0.897)	36.395 ° (18.805)	26.693 *** (7.321)	8.730 (13.033)
Large scale production	low	2.777 (35.667)	59.178 *** (14.304)	77.087 * (33.584)	1.639 (7.929)	-0.414 (2.415)	-0.925 (3.357)	0.669 (3.240)	-0.173 (1.010)	-0.247 (0.810)	51.036 ** (17.901)	20.188 *** (5.364)	2.936 (4.823)
	high	-1.304 (38.879)	38.982 * (15.890)	83.940 * (40.084)	17.005 (11.029)	5.596 ° (3.390)	-0.015 (2.932)	6.942 (4.682)	2.344 ° (1.262)	-0.004 (0.784)	57.047 ** (19.389)	33.090 *** (7.719)	8.961 (13.471)
Trade services and food	low	27.524 (35.524)	46.014 ** (15.669)	72.245 * (31.366)	15.468 (10.095)	3.035 (2.867)	-2.006 (4.968)	6.315 (4.283)	1.271 (1.148)	-0.536 (1.029)	54.627 ** (18.370)	24.096 *** (6.166)	4.484 (6.895)
	high	-26.050 (44.028)	52.146 *** (14.818)	88.782 * (39.406)	3.176 (9.989)	2.147 (2.585)	1.066 (3.812)	1.297 (4.085)	0.900 (1.054)	0.285 (0.916)	53.456 ** (20.629)	29.183 *** (6.921)	7.412 (11.218)
Recreation service	low	58.495 (40.719)	39.328 * (16.505)	58.314 ° (33.621)	3.698 (8.789)	2.568 (2.948)	1.306 (3.824)	1.510 (3.599)	1.076 (1.198)	0.349 (0.864)	42.795 * (17.401)	22.598 *** (6.104)	5.521 (8.415)
	high	-57.022 (49.666)	58.832 ** (18.316)	102.713 ** (38.050)	14.946 (13.376)	2.615 (3.223)	-2.246 (5.727)	6.102 (5.576)	1.095 (1.315)	-0.601 (1.208)	65.287 ** (25.032)	30.680 *** (7.658)	6.375 (9.708)
Knowledge intensive production	low	10.606 (39.627)	66.900 *** (16.390)	128.519 *** (38.340)	12.431 (9.911)	6.158 ° (3.673)	1.993 (5.262)	5.075 (4.153)	2.580 ° (1.362)	0.533 (1.132)	65.703 ** (21.051)	27.437 *** (6.850)	4.560 (7.128)
	high	-9.133 (39.353)	31.259 ° (16.150)	32.508 (36.335)	6.213 (9.415)	-0.976 (2.742)	-2.933 (7.043)	2.537 (3.872)	-0.409 (1.143)	-0.784 (1.427)	42.379 * (17.961)	25.842 *** (6.551)	7.337 (11.086)
Health service	low	1.530 (39.121)	42.171 ** (14.984)	42.781 (34.996)	-12.258 (9.942)	-0.506 (2.481)	3.430 (8.009)	-5.004 (4.163)	-0.212 (1.038)	0.917 (1.588)	68.310 ** (21.602)	25.112 *** (6.231)	2.899 (4.782)
	high	-0.057 (36.957)	55.989 *** (14.749)	118.246 *** (35.260)	30.902 ° (15.797)	5.689 ° (3.311)	-4.370 (9.964)	12.616 ° (6.857)	2.383 ° (1.219)	-1.168 (1.935)	39.773 * (16.425)	28.166 *** (6.737)	8.998 (13.477)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A2: Simple production – Continued 2

Interaction with	Level	Simple Production														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-47.928 (30.965)	0.416 (9.405)	6.855 (21.880)	18.140 ° (10.796)	22.936 *** (4.744)	25.157 ** (9.556)	11.801 * (5.699)	3.794 ** (1.378)	0.396 (0.860)	-2.989 (7.160)	5.877 * (2.638)	11.088 (8.418)	0.161 (6.997)	6.991 ** (2.645)	5.354 (8.619)
Professional service	low	-41.893 (39.286)	-27.389 * (11.599)	-68.564 * (27.825)	16.349 (10.442)	24.536 *** (5.441)	32.917 * (13.116)	10.636 ° (5.697)	4.059 ** (1.509)	0.518 (1.127)	-1.721 (8.878)	-3.867 (3.096)	-4.936 (6.458)	1.479 (8.782)	3.048 (2.429)	1.375 (3.339)
	high	-53.962 (40.536)	28.221 ° (15.436)	82.274 * (36.440)	19.931 (12.226)	21.337 *** (5.696)	17.397 (13.921)	12.966 * (6.551)	3.530 * (1.413)	0.274 (0.625)	-4.256 (8.945)	15.621 ** (5.036)	27.112 (19.178)	-1.157 (9.042)	10.933 * (4.243)	9.332 (14.996)
Primary and related production	low	-68.189 * (34.604)	6.247 (11.811)	3.045 (27.951)	24.064 ° (14.098)	22.890 *** (5.123)	13.394 (10.218)	15.655 * (7.380)	3.787 ** (1.412)	0.211 (0.478)	-7.245 (7.636)	6.750 * (3.187)	15.175 (11.291)	-4.264 (7.923)	13.655 ** (4.404)	7.389 (11.845)
	high	-27.666 (43.947)	-5.415 (14.601)	10.664 (22.996)	12.217 (8.831)	22.983 *** (5.840)	36.920 ** (12.232)	7.948 (5.036)	3.802 * (1.490)	0.580 (1.257)	1.267 (10.068)	5.004 (3.890)	7.001 (6.504)	4.585 (9.907)	0.326 (2.858)	3.318 (5.613)
Large scale production	low	-45.887 (34.704)	6.960 (10.649)	20.560 (24.811)	17.131 (10.541)	17.382 *** (4.256)	12.415 (9.452)	11.145 * (5.657)	2.875 ** (1.110)	0.195 (0.443)	-2.560 (7.978)	6.342 * (2.982)	11.540 (9.031)	0.606 (7.792)	8.429 ** (3.118)	5.126 (8.347)
	high	-49.968 (37.998)	-6.128 (11.831)	-6.851 (29.847)	19.149 (11.665)	28.491 *** (5.960)	37.898 ** (14.215)	12.457 * (6.230)	4.713 ** (1.718)	0.596 (1.295)	-3.417 (8.436)	5.412 ° (3.179)	10.637 (9.091)	-0.285 (8.491)	5.552 * (2.746)	5.581 (9.154)
Trade services and food	low	-21.141 (34.558)	13.197 (11.598)	25.019 (23.719)	18.337 (11.134)	20.747 *** (4.858)	18.965 * (9.387)	11.929 * (5.937)	3.432 ** (1.302)	0.298 (0.655)	2.638 (7.806)	10.139 ** (3.605)	14.139 (10.321)	6.010 (8.065)	6.554 * (2.889)	4.804 (7.821)
	high	-74.714 ° (43.252)	-12.365 (11.051)	-11.310 (28.991)	17.944 (11.412)	25.126 *** (5.365)	31.348 * (12.982)	11.673 ° (6.216)	4.157 ** (1.525)	0.493 (1.074)	-8.616 (9.935)	1.615 (2.793)	8.037 (7.817)	-5.689 (9.838)	7.427 * (2.963)	5.903 (9.626)
Recreation service	low	9.831 (39.879)	2.148 (12.117)	-18.169 (25.057)	14.365 (9.320)	19.457 *** (4.857)	23.351 * (10.541)	9.345 ° (5.118)	3.219 * (1.252)	0.367 (0.803)	9.144 (9.006)	6.988 * (3.400)	5.056 (5.933)	12.774 (10.051)	5.602 * (2.826)	3.877 (6.482)
	high	-105.686 * (48.979)	-1.316 (13.591)	31.878 (28.216)	21.915 (13.905)	26.416 *** (6.003)	26.962 * (12.043)	14.257 ° (7.566)	4.370 ** (1.639)	0.424 (0.927)	-15.122 (11.957)	4.766 (3.558)	17.121 (12.518)	-12.452 (11.769)	8.380 * (3.509)	6.830 (11.011)
Knowledge intensive production	low	-38.058 (38.763)	17.602 (12.399)	41.760 (28.905)	22.055 ° (13.200)	23.623 *** (5.370)	19.285 ° (10.985)	14.348 * (6.989)	3.908 ** (1.466)	0.303 (0.672)	-0.916 (8.497)	5.792 ° (3.292)	9.628 (8.399)	2.316 (8.695)	9.529 ** (3.545)	8.546 (13.649)
	high	-57.797 (38.483)	-16.771 (11.773)	-28.051 (26.595)	14.226 (9.385)	22.250 *** (5.151)	31.029 * (12.561)	9.254 ° (5.188)	3.681 ** (1.390)	0.488 (1.063)	-5.062 (8.845)	5.962 ° (3.263)	12.548 (9.811)	-1.994 (8.625)	4.452 ° (2.616)	2.162 (4.164)
Health service	low	-47.134 (38.246)	21.207 ° (11.057)	45.798 ° (25.548)	22.930 ° (13.673)	21.622 *** (4.878)	12.260 (9.519)	14.917 * (7.225)	3.577 ** (1.338)	0.193 (0.439)	-2.822 (8.676)	7.195 * (3.174)	13.040 (9.956)	0.334 (8.544)	6.007 * (2.717)	2.845 (5.034)
	high	-48.721 (36.029)	-20.375 ° (11.071)	-32.089 (26.925)	13.351 (8.715)	24.251 *** (5.233)	38.054 ** (13.409)	8.685 ° (4.798)	4.012 ** (1.477)	0.598 (1.298)	-3.155 (8.029)	4.558 (2.917)	9.136 (7.908)	-0.012 (8.070)	7.975 ** (3.066)	7.863 (12.558)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A2: Simple production – Continued 3

Interaction with	Level	Simple Production											
		Tax via GDP			Tax via GDP and joblessness			Tax via GDP and wages			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		12.854 (9.318)	5.728 (4.454)	-2.261 (9.678)	1.278 (1.249)	0.935 (0.758)	-0.531 (2.285)	1.068 (1.193)	1.602 (1.285)	-0.828 (3.579)	0.831 (0.759)	0.155 (0.134)	-0.008 (0.040)
Professional service	low	33.427 * (14.353)	11.396 ° (6.063)	-13.263 (14.523)	3.322 (2.605)	1.859 ° (1.078)	-3.118 (3.639)	2.779 (2.643)	3.188 ° (1.808)	-4.859 (6.045)	2.161 (1.519)	0.308 (0.201)	-0.049 (0.119)
	high	-7.720 (12.650)	0.060 (7.729)	8.742 (19.238)	-0.767 (1.354)	0.010 (1.261)	2.055 (4.598)	-0.642 (1.184)	0.017 (2.162)	3.203 (7.298)	-0.499 (0.864)	0.002 (0.209)	0.032 (0.100)
Primary and related production	low	28.564 * (11.891)	9.177 (5.769)	-12.516 (14.324)	2.839 (2.206)	1.497 (1.003)	-2.942 (3.571)	2.374 (2.244)	2.567 (1.691)	-4.586 (5.905)	1.847 (1.283)	0.248 (0.182)	-0.046 (0.114)
	high	-2.856 (14.100)	2.279 (7.606)	7.995 (10.705)	-0.284 (1.414)	0.372 (1.244)	1.879 (2.629)	-0.237 (1.189)	0.638 (2.131)	2.929 (4.287)	-0.185 (0.917)	0.062 (0.207)	0.030 (0.076)
Large scale production	low	2.260 (10.900)	-0.914 (5.327)	-4.451 (12.922)	0.225 (1.093)	-0.149 (0.870)	-1.046 (3.067)	0.188 (0.920)	-0.256 (1.491)	-1.631 (4.831)	0.146 (0.709)	-0.025 (0.144)	-0.016 (0.060)
	high	23.447 ° (12.405)	12.370 * (5.880)	-0.070 (14.103)	2.330 (1.964)	2.018 ° (1.067)	-0.017 (3.315)	1.949 (1.949)	3.461 ° (1.780)	-0.026 (5.167)	1.516 (1.164)	0.334 (0.203)	0.000 (0.052)
Trade services and food	low	21.328 ° (11.390)	6.709 (5.815)	-9.649 (11.405)	2.120 (1.793)	1.095 (0.982)	-2.268 (2.833)	1.773 (1.778)	1.877 (1.668)	-3.535 (4.671)	1.379 (1.063)	0.181 (0.171)	-0.036 (0.088)
	high	4.379 (13.675)	4.747 (5.429)	5.127 (14.549)	0.435 (1.389)	0.775 (0.904)	1.205 (3.454)	0.364 (1.178)	1.328 (1.541)	1.879 (5.445)	0.283 (0.898)	0.128 (0.154)	0.019 (0.068)
Recreation service	low	5.099 (11.967)	5.676 (6.157)	6.283 (12.305)	0.507 (1.235)	0.926 (1.027)	1.477 (2.953)	0.424 (1.058)	1.588 (1.751)	2.302 (4.709)	0.330 (0.795)	0.153 (0.176)	0.023 (0.068)
	high	20.609 (16.746)	5.780 (6.785)	-10.805 (14.347)	2.048 (2.139)	0.943 (1.128)	-2.540 (3.525)	1.713 (2.013)	1.617 (1.925)	-3.959 (5.753)	1.332 (1.312)	0.156 (0.192)	-0.040 (0.102)
Knowledge intensive production	low	17.140 (12.059)	13.613 * (6.307)	9.590 (14.319)	1.704 (1.639)	2.221 ° (1.150)	2.254 (3.487)	1.425 (1.571)	3.808 * (1.917)	3.514 (5.642)	1.108 (0.994)	0.367 ° (0.220)	0.035 (0.094)
	high	8.567 (12.578)	-2.157 (6.006)	-14.112 (14.295)	0.852 (1.369)	-0.352 (0.983)	-3.317 (3.618)	0.712 (1.208)	-0.604 (1.684)	-5.170 (6.062)	0.554 (0.870)	-0.058 (0.164)	-0.052 (0.125)
Health service	low	-16.902 (12.155)	-1.119 (5.468)	16.500 (13.947)	-1.680 (1.635)	-0.183 (0.893)	3.879 (3.634)	-1.405 (1.563)	-0.313 (1.531)	6.045 (6.233)	-1.093 (0.994)	-0.030 (0.148)	0.061 (0.142)
	high	42.610 ** (14.798)	12.575 * (5.592)	-21.022 (14.275)	4.235 (3.144)	2.052 * (1.028)	-4.941 (3.905)	3.542 (3.248)	3.518 * (1.710)	-7.702 (6.930)	2.755 (1.807)	0.339 ° (0.198)	-0.078 (0.177)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A2: Simple production – Continued 4

Interaction with	Level	Simple Production											
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-49.033 ° (29.503)	-0.689 ** (0.212)	-1.592 ** (0.498)	0.247 (0.185)	0.011 (0.020)	0.031 (0.132)	0.081 (0.067)	0.039 (0.031)	-0.016 (0.069)	-0.108 (0.085)	0.001 (0.007)	-0.020 (0.085)
Professional service	low	-42.999 (38.145)	-0.388 (0.265)	-1.565 * (0.634)	0.641 * (0.303)	0.022 (0.038)	0.180 (0.217)	0.210 ° (0.123)	0.077 ° (0.043)	-0.095 (0.110)	-0.281 ° (0.149)	0.002 (0.014)	-0.116 (0.134)
	high	-55.067 (39.430)	-0.991 ** (0.350)	-1.619 ° (0.831)	-0.148 (0.244)	0.000 (0.015)	-0.119 (0.268)	-0.048 (0.082)	0.000 (0.052)	0.062 (0.139)	0.065 (0.108)	0.000 (0.001)	0.076 (0.170)
Primary and related production	low	-69.294 * (33.302)	-0.908 *** (0.267)	-1.733 ** (0.630)	0.548 * (0.252)	0.018 (0.032)	0.170 (0.212)	0.179 ° (0.103)	0.062 (0.041)	-0.089 (0.108)	-0.241 ° (0.124)	0.001 (0.011)	-0.109 (0.132)
	high	-28.772 (42.929)	-0.471 (0.329)	-1.451 ** (0.530)	-0.055 (0.271)	0.004 (0.016)	-0.108 (0.155)	-0.018 (0.089)	0.015 (0.051)	0.057 (0.079)	0.024 (0.119)	0.000 (0.003)	0.070 (0.097)
Large scale production	low	-46.993 (33.406)	-0.863 *** (0.243)	-2.003 *** (0.560)	0.043 (0.209)	-0.002 (0.011)	0.060 (0.178)	0.014 (0.069)	-0.006 (0.036)	-0.032 (0.093)	-0.019 (0.092)	0.000 (0.001)	-0.039 (0.114)
	high	-51.073 (36.816)	-0.516 ° (0.270)	-1.181 ° (0.698)	0.450 ° (0.254)	0.024 (0.041)	0.001 (0.191)	0.147 (0.098)	0.084 * (0.042)	-0.001 (0.101)	-0.197 (0.121)	0.002 (0.015)	-0.001 (0.123)
Trade services and food	low	-22.246 (33.254)	-0.742 ** (0.261)	-1.108 * (0.538)	0.409 ° (0.233)	0.013 (0.024)	0.131 (0.168)	0.134 (0.089)	0.045 (0.040)	-0.069 (0.085)	-0.180 (0.111)	0.001 (0.008)	-0.084 (0.104)
	high	-75.820 ° (42.218)	-0.637 * (0.249)	-2.076 ** (0.659)	0.084 (0.263)	0.009 (0.018)	-0.070 (0.200)	0.027 (0.087)	0.032 (0.037)	0.037 (0.105)	-0.037 (0.116)	0.001 (0.006)	0.045 (0.128)
Recreation service	low	8.726 (38.755)	-0.379 (0.273)	-1.881 *** (0.569)	0.098 (0.230)	0.011 (0.022)	-0.085 (0.172)	0.032 (0.076)	0.038 (0.042)	0.045 (0.089)	-0.043 (0.102)	0.001 (0.007)	0.055 (0.109)
	high	-106.791 * (48.068)	-1.000 ** (0.306)	-1.303 * (0.641)	0.395 (0.331)	0.011 (0.023)	0.147 (0.208)	0.129 (0.117)	0.039 (0.046)	-0.077 (0.106)	-0.174 (0.151)	0.001 (0.007)	-0.094 (0.130)
Knowledge intensive production	low	-39.163 (37.605)	-0.416 (0.280)	-0.952 (0.655)	0.329 (0.240)	0.026 (0.045)	-0.130 (0.205)	0.108 (0.087)	0.092 * (0.046)	0.068 (0.105)	-0.144 (0.111)	0.002 (0.017)	0.084 (0.129)
	high	-58.903 (37.316)	-0.963 *** (0.266)	-2.232 *** (0.608)	0.164 (0.243)	-0.004 (0.013)	0.191 (0.217)	0.054 (0.082)	-0.015 (0.041)	-0.101 (0.109)	-0.072 (0.108)	0.000 (0.003)	-0.123 (0.133)
Health service	low	-48.240 (37.072)	-0.677 ** (0.250)	-1.282 * (0.579)	-0.324 (0.242)	-0.002 (0.011)	-0.224 (0.220)	-0.106 (0.087)	-0.008 (0.037)	0.118 (0.109)	0.142 (0.111)	0.000 (0.002)	0.144 (0.133)
	high	-49.826 (34.781)	-0.702 ** (0.251)	-1.902 ** (0.617)	0.818 * (0.326)	0.024 (0.042)	0.285 (0.241)	0.267 ° (0.142)	0.085 * (0.041)	-0.150 (0.117)	-0.359 * (0.166)	0.002 (0.016)	-0.183 (0.143)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A2: Simple production – Continued 5

Interaction with	Level	Simple Production								
		Population development via joblessness			Population development via taxes			Population development via joblessness and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		1.146 *** (0.331)	0.950 *** (0.139)	0.763 ** (0.271)	0.404 (0.289)	0.000 (0.001)	0.060 (0.192)	-0.153 (0.102)	0.003 (0.028)	0.219 ° (0.118)
Professional service	low	1.033 ** (0.383)	1.016 *** (0.170)	0.998 ** (0.375)	0.353 (0.348)	-0.004 (0.034)	-0.597 ° (0.332)	-0.138 (0.098)	0.004 (0.030)	0.287 ° (0.158)
	high	1.259 ** (0.409)	0.883 *** (0.198)	0.528 (0.416)	0.454 (0.369)	0.004 (0.035)	0.717 ° (0.418)	-0.168 (0.115)	0.003 (0.026)	0.152 (0.134)
Primary and related production	low	1.520 *** (0.409)	0.948 *** (0.161)	0.406 (0.305)	0.574 ° (0.340)	0.001 (0.008)	0.027 (0.244)	-0.203 (0.134)	0.003 (0.028)	0.117 (0.099)
	high	0.772 * (0.387)	0.951 *** (0.198)	1.120 ** (0.340)	0.233 (0.377)	-0.001 (0.007)	0.093 (0.203)	-0.103 (0.081)	0.003 (0.028)	0.322 * (0.162)
Large scale production	low	1.082 ** (0.356)	0.720 *** (0.142)	0.376 (0.282)	0.386 (0.315)	0.001 (0.009)	0.179 (0.227)	-0.144 (0.099)	0.003 (0.022)	0.108 (0.092)
	high	1.210 ** (0.383)	1.180 *** (0.177)	1.149 ** (0.403)	0.421 (0.345)	-0.001 (0.008)	-0.060 (0.261)	-0.161 (0.110)	0.004 (0.035)	0.330 ° (0.176)
Trade services and food	low	1.158 ** (0.363)	0.859 *** (0.157)	0.575 * (0.274)	0.178 (0.296)	0.002 (0.016)	0.218 (0.223)	-0.154 (0.105)	0.003 (0.026)	0.165 (0.103)
	high	1.133 ** (0.415)	1.040 *** (0.162)	0.951 * (0.373)	0.629 (0.412)	-0.002 (0.015)	-0.099 (0.255)	-0.151 (0.107)	0.004 (0.031)	0.273 ° (0.153)
Recreation service	low	0.907 * (0.352)	0.806 *** (0.163)	0.708 * (0.305)	-0.083 (0.337)	0.000 (0.003)	-0.158 (0.226)	-0.121 (0.087)	0.003 (0.024)	0.203 ° (0.120)
	high	1.384 ** (0.503)	1.094 *** (0.191)	0.818 * (0.349)	0.890 ° (0.495)	0.000 (0.003)	0.278 (0.268)	-0.185 (0.130)	0.004 (0.033)	0.235 ° (0.138)
Knowledge intensive production	low	1.393 *** (0.412)	0.978 *** (0.171)	0.585 ° (0.324)	0.320 (0.341)	0.003 (0.022)	0.364 (0.287)	-0.186 (0.125)	0.003 (0.029)	0.168 (0.115)
	high	0.899 * (0.364)	0.921 *** (0.166)	0.941 ** (0.360)	0.487 (0.357)	-0.002 (0.021)	-0.244 (0.250)	-0.120 (0.087)	0.003 (0.028)	0.270 ° (0.150)
Health service	low	1.448 *** (0.422)	0.895 *** (0.154)	0.372 (0.284)	0.397 (0.344)	0.003 (0.026)	0.399 (0.269)	-0.193 (0.129)	0.003 (0.027)	0.107 (0.092)
	high	0.843 * (0.333)	1.004 *** (0.160)	1.154 ** (0.376)	0.410 (0.328)	-0.003 (0.025)	-0.280 (0.258)	-0.112 (0.081)	0.004 (0.030)	0.332 ° (0.172)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A3: Primary and related production

Interaction with	Level	Primary and related production											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-2.098 ° (1.082)	-1.169 * (0.591)	-0.239 (1.212)	-2.820 *** (0.468)	-0.610 * (0.251)	1.601 ** (0.519)	0.225 (0.149)	0.147 ° (0.080)	0.034 (0.175)	34.927 (26.770)	-31.664 * (13.665)	-98.254 *** (28.360)
Professional service	low	1.204 (1.140)	-0.101 (0.661)	-1.406 (1.049)	-2.882 *** (0.482)	-0.797 ** (0.279)	1.289 ** (0.445)	-0.129 (0.133)	0.013 (0.083)	0.203 (0.177)	-19.812 (28.668)	-48.754 ** (15.256)	-77.695 ** (25.085)
	high	-5.401 *** (1.530)	-2.236 * (1.086)	0.928 (2.298)	-2.758 *** (0.678)	-0.422 (0.461)	1.913 ° (0.981)	0.580 * (0.290)	0.281 ° (0.147)	-0.134 (0.337)	89.666 * (37.310)	-14.574 (24.899)	-118.813 * (53.157)
Simple production	low	-0.101 (1.469)	-0.754 (0.981)	-1.408 (1.633)	-3.634 *** (0.625)	-0.605 (0.414)	2.423 *** (0.696)	0.011 (0.158)	0.095 (0.125)	0.203 (0.253)	14.573 (36.229)	-26.574 (22.507)	-67.722 ° (38.294)
	high	-4.096 ** (1.562)	-1.583 * (0.688)	0.930 (1.301)	-2.007 ** (0.672)	-0.614 * (0.292)	0.779 (0.555)	0.440 ° (0.247)	0.199 * (0.095)	-0.134 (0.197)	55.280 (36.644)	-36.754 * (15.846)	-128.787 *** (29.966)
Large scale production	low	-1.444 (1.424)	-0.633 (0.745)	0.179 (1.642)	-3.448 *** (0.603)	-1.023 ** (0.315)	1.401 * (0.693)	0.155 (0.166)	0.080 (0.095)	-0.026 (0.237)	32.485 (33.889)	-18.080 (17.247)	-68.644 ° (37.554)
	high	-2.753 * (1.378)	-1.705 * (0.719)	-0.657 (1.534)	-2.193 *** (0.601)	-0.196 (0.306)	1.801 ** (0.668)	0.295 (0.192)	0.214 * (0.100)	0.095 (0.225)	37.368 (33.887)	-45.248 ** (16.553)	-127.864 *** (36.704)
Trade services and food	low	-4.113 ** (1.464)	-2.245 ** (0.832)	-0.378 (1.572)	-2.830 *** (0.633)	-0.699 * (0.355)	1.433 * (0.675)	0.441 ° (0.240)	0.282 * (0.118)	0.054 (0.228)	108.756 ** (35.009)	-20.961 (19.281)	-150.678 *** (36.627)
	high	-0.084 (1.508)	-0.092 (0.682)	-0.100 (1.357)	-2.810 *** (0.641)	-0.520 ° (0.288)	1.769 ** (0.575)	0.009 (0.162)	0.012 (0.086)	0.014 (0.196)	-38.903 (36.252)	-42.367 ** (15.610)	-45.831 (31.958)
Recreation service	low	-2.231 (1.678)	-0.738 (0.887)	0.754 (1.690)	-3.168 *** (0.719)	-0.504 (0.375)	2.161 ** (0.718)	0.239 (0.205)	0.093 (0.113)	-0.109 (0.249)	-24.185 (40.095)	-41.820 * (20.317)	-59.454 (39.208)
	high	-1.966 (2.295)	-1.599 (0.991)	-1.232 (1.483)	-2.472 * (0.971)	-0.716 ° (0.420)	1.041 (0.633)	0.211 (0.261)	0.201 (0.131)	0.178 (0.228)	94.039 ° (54.653)	-21.508 (23.092)	-137.054 *** (34.677)
Knowledge intensive production	low	-1.742 (1.473)	-0.629 (0.862)	0.484 (1.621)	-2.085 *** (0.631)	-0.915 * (0.364)	0.255 (0.691)	0.187 (0.176)	0.079 (0.110)	-0.070 (0.236)	22.700 (35.025)	-18.457 (19.918)	-59.615 (37.240)
	high	-2.454 (1.568)	-1.708 ° (0.986)	-0.962 (2.175)	-3.556 *** (0.668)	-0.305 (0.418)	2.947 ** (0.921)	0.263 (0.200)	0.215 (0.131)	0.139 (0.320)	47.153 (37.456)	-44.871 * (22.514)	-136.894 ** (50.342)
Health service	low	-1.956 (1.388)	-1.905 * (0.759)	-1.853 (1.647)	-2.402 *** (0.589)	-0.310 (0.324)	1.783 * (0.703)	0.210 (0.172)	0.240 * (0.106)	0.267 (0.266)	-42.170 (33.335)	-60.371 *** (17.533)	-78.572 * (38.435)
	high	-2.240 (1.540)	-0.432 (0.789)	1.375 (1.575)	-3.238 *** (0.664)	-0.909 ** (0.334)	1.419 * (0.670)	0.240 (0.193)	0.054 (0.100)	-0.198 (0.244)	112.023 ** (36.932)	-2.957 (18.196)	-117.937 ** (36.286)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A3: Primary and related production – Continued 1

Interaction with	Level	Primary and related production											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-64.385 * (25.255)	-7.041 (12.760)	50.303 ° (27.881)	-12.021 (8.169)	-4.418 (2.842)	-0.438 (2.421)	-4.908 (3.456)	-1.851 ° (1.074)	-0.117 (0.621)	61.461 *** (18.210)	7.679 * (3.530)	-5.442 (8.242)
Professional service	low	-73.714 * (29.761)	-37.721 ** (14.240)	-1.728 (26.376)	6.898 (7.207)	-0.381 (2.505)	-2.576 (5.989)	2.816 (2.988)	-0.160 (1.048)	-0.689 (1.183)	62.810 *** (18.657)	10.036 * (4.079)	-4.380 (6.654)
	high	-55.057 (34.698)	23.639 (23.257)	102.334 * (49.469)	-30.941 ° (16.253)	-8.456 (5.310)	1.700 (5.634)	-12.632 ° (7.034)	-3.542 ° (1.995)	0.455 (1.327)	60.112 ** (20.882)	5.321 (5.911)	-6.504 (10.183)
Simple production	low	-1.126 (33.970)	39.962 ° (20.735)	81.049 * (36.115)	-0.576 (8.417)	-2.851 (3.878)	-2.579 (6.420)	-0.235 (3.437)	-1.194 (1.590)	-0.690 (1.333)	79.187 *** (23.739)	7.625 (5.448)	-8.236 (12.412)
	high	-127.645 *** (34.053)	-54.044 *** (14.960)	19.557 (29.951)	-23.466 ° (13.707)	-5.986 ° (3.527)	1.704 (4.444)	-9.580 (5.869)	-2.507 ° (1.303)	0.456 (0.950)	43.735 * (18.166)	7.733 ° (4.013)	-2.648 (4.348)
Large scale production	low	-88.823 ** (32.051)	-18.119 (15.921)	52.585 (35.986)	-8.272 (8.940)	-2.392 (2.973)	0.328 (3.094)	-3.377 (3.703)	-1.002 (1.214)	0.088 (0.816)	75.137 *** (22.651)	12.888 ** (4.773)	-4.764 (7.431)
	high	-39.948 (31.400)	4.036 (15.522)	48.021 (35.166)	-15.771 (10.536)	-6.445 ° (3.738)	-1.203 (3.863)	-6.439 (4.463)	-2.700 * (1.375)	-0.322 (0.902)	47.785 ** (17.578)	2.470 (3.889)	-6.120 (9.335)
Trade services and food	low	-36.840 (33.193)	4.483 (17.935)	45.806 (36.238)	-23.563 ° (13.380)	-8.489 ° (4.616)	-0.692 (3.259)	-9.620 ° (5.744)	-3.556 * (1.662)	-0.185 (0.822)	61.683 ** (20.485)	8.804 ° (4.822)	-4.869 (7.560)
	high	-91.931 ** (33.698)	-18.565 (14.514)	54.800 ° (30.086)	-0.480 (8.641)	-0.348 (2.583)	-0.184 (2.520)	-0.196 (3.528)	-0.146 (1.081)	-0.049 (0.669)	61.239 ** (20.518)	6.554 ° (3.872)	-6.014 (9.110)
Recreation service	low	-52.578 (38.750)	16.149 (18.787)	84.877 * (38.024)	-12.780 (11.151)	-2.791 (3.533)	1.382 (4.343)	-5.218 (4.653)	-1.169 (1.444)	0.370 (1.006)	69.045 ** (23.091)	6.343 (4.901)	-7.346 (11.139)
	high	-76.193 (50.461)	-30.232 (21.517)	15.729 (33.030)	-11.263 (14.061)	-6.046 (4.451)	-2.258 (5.666)	-4.598 (5.803)	-2.533 (1.727)	-0.604 (1.183)	53.877 * (24.958)	9.015 (5.603)	-3.538 (5.659)
Knowledge intensive production	low	-29.550 (32.579)	-11.684 (18.408)	6.182 (35.301)	-9.983 (9.526)	-2.378 (3.394)	0.888 (3.556)	-4.075 (3.961)	-0.996 (1.394)	0.237 (0.875)	45.434 * (17.702)	11.522 * (5.162)	-0.868 (2.676)
	high	-99.221 ** (35.030)	-2.398 (20.874)	94.424 * (47.654)	-14.060 (10.927)	-6.459 (4.528)	-1.764 (5.564)	-5.740 (4.585)	-2.706 (1.741)	-0.472 (1.291)	77.487 ** (23.965)	3.836 (5.321)	-10.016 (15.145)
Health service	low	-62.591 ° (32.112)	-27.462 ° (16.434)	7.666 (37.539)	-11.209 (9.369)	-7.202 ° (4.054)	-3.396 (8.064)	-4.576 (3.917)	-3.017 * (1.477)	-0.908 (1.620)	52.352 ** (18.166)	3.903 (4.156)	-6.059 (9.277)
	high	-66.180 ° (34.407)	13.380 (16.839)	92.940 ** (34.244)	-12.834 (10.490)	-1.635 (3.053)	2.520 (6.254)	-5.240 (4.391)	-0.685 (1.265)	0.674 (1.297)	70.570 ** (22.581)	11.455 * (4.824)	-4.824 (7.492)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A3: Primary and related production – Continued 2

Interaction with	Level	Primary and related production														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		32.401 ° (18.588)	3.315 (9.238)	-25.772 (20.279)	20.631 ° (12.089)	6.612 * (2.962)	-23.014 * (9.624)	13.421 * (6.329)	1.094 ° (0.589)	-0.362 (0.789)	7.337 (6.094)	-5.455 * (2.626)	-13.212 (9.510)	-14.060 ° (7.552)	-1.003 (1.839)	3.345 (5.566)
Professional service	low	-1.013 (21.901)	-11.590 (10.414)	-22.167 (19.111)	21.084 ° (12.362)	8.642 * (3.397)	-18.523 * (8.052)	13.716 * (6.475)	1.430 * (0.705)	-0.291 (0.636)	-4.162 (6.168)	-8.399 ** (3.180)	-10.448 (7.670)	-16.097 ° (8.781)	-5.373 * (2.525)	-0.115 (1.763)
	high	65.816 ** (25.234)	18.220 (16.824)	-29.376 (35.963)	20.178 (12.377)	4.582 (5.068)	-27.506 ° (15.862)	13.127 * (6.632)	0.758 (0.868)	-0.432 (0.959)	18.836 ° (9.887)	-2.511 (4.322)	-15.977 (12.730)	-12.023 (8.768)	3.367 (3.444)	6.805 (11.172)
Simple production	low	47.943 ° (24.534)	9.172 (15.063)	-29.599 (26.294)	26.581 ° (15.623)	6.565 (4.642)	-34.830 * (13.598)	17.292 * (8.193)	1.086 (0.833)	-0.548 (1.191)	3.061 (7.673)	-4.578 (3.998)	-9.106 (7.910)	-0.246 (7.419)	5.692 ° (3.356)	5.389 (8.791)
	high	16.860 (25.628)	-2.542 (11.007)	-21.945 (22.065)	14.681 (9.606)	6.658 * (3.387)	-11.198 (8.509)	9.550 ° (5.293)	1.101 ° (0.650)	-0.176 (0.400)	11.612 (8.548)	-6.331 * (3.046)	-17.318 (12.109)	-27.874 * (12.645)	-7.698 * (3.031)	1.300 (2.851)
Large scale production	low	47.585 * (23.992)	6.005 (11.553)	-35.574 (26.307)	25.222 ° (14.846)	11.097 ** (3.947)	-20.146 ° (11.295)	16.408 * (7.791)	1.836 * (0.852)	-0.317 (0.701)	6.824 (7.446)	-3.115 (3.044)	-9.231 (7.908)	-19.396 ° (9.981)	-2.581 (2.380)	3.497 (5.986)
	high	17.218 (22.728)	0.624 (11.214)	-15.969 (25.469)	16.040 (10.029)	2.127 (3.341)	-25.882 * (11.791)	10.435 ° (5.421)	0.352 (0.563)	-0.407 (0.890)	7.850 (7.549)	-7.795 * (3.301)	-17.194 (12.364)	-8.724 (7.567)	0.575 (2.217)	3.193 (5.529)
Trade services and food	low	38.339 (24.252)	11.615 (12.972)	-15.109 (26.309)	20.705 ° (12.524)	7.580 ° (4.077)	-20.593 ° (11.121)	13.470 * (6.666)	1.254 (0.771)	-0.324 (0.715)	22.846 * (10.369)	-3.611 (3.410)	-20.262 (14.238)	-8.045 (7.826)	0.639 (2.561)	3.046 (5.352)
	high	26.463 (24.654)	-4.985 (10.516)	-36.434 ° (21.845)	20.556 (12.467)	5.643 ° (3.282)	-25.435 * (10.655)	13.373 * (6.644)	0.934 (0.610)	-0.400 (0.872)	-8.172 (8.052)	-7.298 * (3.107)	-6.163 (5.914)	-20.075 ° (10.412)	-2.644 (2.196)	3.644 (6.057)
Recreation service	low	27.417 (28.071)	-1.464 (13.612)	-30.345 (27.661)	23.177 (14.049)	5.461 (4.182)	-31.066 * (13.194)	15.078 * (7.485)	0.903 (0.742)	-0.488 (1.066)	-5.080 (8.578)	-7.204 ° (3.822)	-7.995 (7.455)	-11.482 (9.452)	2.300 (2.752)	5.644 (9.209)
	high	37.385 (36.816)	8.094 (15.583)	-21.198 (24.172)	18.085 (12.401)	7.762 (4.757)	-14.962 (9.919)	11.765 ° (6.952)	1.284 (0.875)	-0.235 (0.527)	19.754 (13.106)	-3.705 (4.056)	-18.430 (13.015)	-16.638 (12.597)	-4.306 (3.293)	1.046 (2.742)
Knowledge intensive production	low	61.732 ** (23.632)	18.761 (13.303)	-24.210 (25.589)	15.251 (9.734)	9.921 * (4.325)	-3.670 (9.978)	9.922 ° (5.310)	1.641 ° (0.867)	-0.058 (0.200)	4.769 (7.514)	-3.180 (3.498)	-8.016 (7.281)	-6.453 (7.498)	-1.664 (2.663)	0.411 (2.434)
	high	3.071 (25.794)	-12.131 (15.132)	-27.334 (34.609)	26.010 ° (15.415)	3.302 (4.568)	-42.358 * (17.340)	16.921 * (8.120)	0.546 (0.773)	-0.666 (1.451)	9.905 (8.483)	-7.730 ° (4.214)	-18.408 (13.897)	-21.667 * (11.032)	-0.342 (2.975)	6.279 (10.349)
Health service	low	26.857 (23.466)	2.464 (11.920)	-21.929 (27.333)	17.573 (10.776)	3.360 (3.561)	-25.625 * (12.164)	11.432 * (5.773)	0.556 (0.612)	-0.403 (0.883)	-8.858 (7.554)	-10.400 ** (3.747)	-10.566 (8.674)	-13.668 (8.621)	-3.912 (2.584)	0.510 (2.621)
	high	37.945 (25.107)	4.165 (12.269)	-29.615 (24.982)	23.689 ° (14.173)	9.863 * (4.027)	-20.403 ° (11.034)	15.411 * (7.502)	1.632 * (0.825)	-0.321 (0.708)	23.532 * (10.812)	-0.509 (3.136)	-15.859 (11.539)	-14.452 (9.196)	1.906 (2.457)	6.180 (9.961)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A3: Primary and related production – Continued 3

Interaction with	Level	Primary and related production											
		Tax via GDP			Tax via GDP and joblessness			Tax via GDP and wages			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-16.576 ° (9.392)	-9.767 ° (5.101)	-2.107 (10.707)	-1.647 (1.428)	-1.594 ° (0.910)	-0.495 (2.525)	-1.378 (1.406)	-2.732 ° (1.525)	-0.772 (3.949)	-1.072 (0.851)	-0.264 (0.170)	-0.008 (0.043)
Professional service	low	9.511 (9.275)	-0.843 (5.527)	-12.391 (10.118)	0.945 (1.111)	-0.137 (0.902)	-2.913 (2.654)	0.791 (1.022)	-0.236 (1.547)	-4.540 (4.575)	0.615 (0.690)	-0.023 (0.149)	-0.046 (0.107)
	high	-42.663 ** (15.689)	-18.691 * (9.405)	8.178 (20.437)	-4.240 (3.189)	-3.050 ° (1.688)	1.922 (4.866)	-3.546 (3.280)	-5.229 ° (2.825)	2.996 (7.694)	-2.758 (1.839)	-0.505 (0.317)	0.030 (0.100)
Simple production	low	-0.795 (11.602)	-6.302 (8.239)	-12.409 (14.972)	-0.079 (1.154)	-1.028 (1.365)	-2.917 (3.711)	-0.066 (0.966)	-1.763 (2.331)	-4.546 (6.107)	-0.051 (0.751)	-0.170 (0.231)	-0.046 (0.114)
	high	-32.357 * (14.487)	-13.231 * (6.006)	8.196 (11.782)	-3.216 (2.554)	-2.159 * (1.099)	1.926 (2.877)	-2.690 (2.581)	-3.702 * (1.831)	3.003 (4.666)	-2.092 (1.494)	-0.357 ° (0.211)	0.030 (0.079)
Large scale production	low	-11.406 (11.560)	-5.287 (6.265)	1.576 (14.486)	-1.134 (1.369)	-0.863 (1.041)	0.370 (3.408)	-0.948 (1.253)	-1.479 (1.777)	0.577 (5.318)	-0.737 (0.853)	-0.143 (0.177)	0.006 (0.055)
	high	-21.746 ° (12.022)	-14.247 * (6.296)	-5.789 (13.661)	-2.161 (1.854)	-2.325 * (1.159)	-1.361 (3.258)	-1.808 (1.831)	-3.986 * (1.928)	-2.121 (5.159)	-1.406 (1.103)	-0.385 ° (0.223)	-0.021 (0.069)
Trade services and food	low	-32.490 * (13.850)	-18.765 * (7.378)	-3.329 (13.903)	-3.229 (2.526)	-3.062 * (1.396)	-0.782 (3.283)	-2.701 (2.565)	-5.250 * (2.308)	-1.220 (5.145)	-2.101 (1.472)	-0.506 ° (0.276)	-0.012 (0.058)
	high	-0.661 (11.912)	-0.769 (5.703)	-0.884 (11.968)	-0.066 (1.185)	-0.125 (0.931)	-0.208 (2.815)	-0.055 (0.991)	-0.215 (1.596)	-0.324 (4.389)	-0.043 (0.771)	-0.021 (0.154)	-0.003 (0.045)
Recreation service	low	-17.622 (13.882)	-6.169 (7.458)	6.650 (15.064)	-1.751 (1.795)	-1.007 (1.239)	1.563 (3.597)	-1.465 (1.696)	-1.726 (2.114)	2.436 (5.704)	-1.139 (1.099)	-0.167 (0.211)	0.025 (0.077)
	high	-15.530 (18.492)	-13.364 (8.462)	-10.863 (13.561)	-1.543 (2.098)	-2.181 (1.470)	-2.553 (3.351)	-1.291 (1.888)	-3.739 (2.479)	-3.980 (5.496)	-1.004 (1.320)	-0.361 (0.266)	-0.040 (0.101)
Knowledge intensive production	low	-13.764 (12.077)	-5.257 (7.238)	4.271 (14.359)	-1.368 (1.499)	-0.858 (1.197)	1.004 (3.400)	-1.144 (1.397)	-1.471 (2.045)	1.565 (5.342)	-0.890 (0.925)	-0.142 (0.203)	0.016 (0.063)
	high	-19.387 (13.196)	-14.277 ° (8.451)	-8.484 (19.375)	-1.927 (1.822)	-2.329 (1.480)	-1.994 (4.625)	-1.611 (1.753)	-3.994 (2.491)	-3.108 (7.332)	-1.254 (1.102)	-0.385 (0.270)	-0.031 (0.099)
Health service	low	-15.455 (11.545)	-15.920 * (6.675)	-16.337 (15.497)	-1.536 (1.527)	-2.598 * (1.243)	-3.840 (3.960)	-1.285 (1.452)	-4.454 * (2.062)	-5.986 (6.688)	-0.999 (0.931)	-0.430 ° (0.242)	-0.060 (0.143)
	high	-17.696 (12.851)	-3.614 (6.611)	12.124 (14.449)	-1.759 (1.721)	-0.590 (1.087)	2.850 (3.586)	-1.471 (1.643)	-1.011 (1.860)	4.442 (5.908)	-1.144 (1.047)	-0.098 (0.182)	0.045 (0.111)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A3: Primary and related production – Continued 4

Interaction with	Level	Primary and related production											
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-1.289 ** (0.421)	-0.823 *** (0.209)	-0.358 (0.458)	-0.318 ° (0.191)	-0.019 (0.033)	0.029 (0.146)	-0.104 (0.072)	-0.066 ° (0.036)	-0.015 (0.077)	0.140 (0.090)	-0.001 (0.012)	-0.018 (0.094)
Professional service	low	-2.013 *** (0.498)	-1.074 *** (0.237)	-0.134 (0.431)	0.183 (0.182)	-0.002 (0.011)	0.168 (0.161)	0.060 (0.063)	-0.006 (0.037)	-0.088 (0.080)	-0.080 (0.082)	0.000 (0.001)	-0.108 (0.097)
	high	-0.565 (0.573)	-0.573 (0.379)	-0.582 (0.812)	-0.819 * (0.341)	-0.036 (0.063)	-0.111 (0.283)	-0.268 ° (0.145)	-0.126 ° (0.067)	0.058 (0.147)	0.359 * (0.172)	-0.003 (0.023)	0.071 (0.180)
Simple production	low	-1.586 ** (0.566)	-1.043 ** (0.342)	-0.499 (0.593)	-0.015 (0.223)	-0.012 (0.026)	0.168 (0.220)	-0.005 (0.073)	-0.043 (0.056)	-0.088 (0.112)	0.007 (0.098)	-0.001 (0.008)	-0.108 (0.137)
	high	-0.992 ° (0.580)	-0.604 * (0.248)	-0.216 (0.501)	-0.621 * (0.303)	-0.025 (0.044)	-0.111 (0.169)	-0.203 ° (0.122)	-0.089 * (0.044)	0.058 (0.087)	0.272 ° (0.148)	-0.002 (0.016)	0.071 (0.106)
Large scale production	low	-1.723 ** (0.543)	-0.875 *** (0.262)	-0.027 (0.595)	-0.219 (0.226)	-0.010 (0.021)	-0.021 (0.197)	-0.072 (0.078)	-0.036 (0.043)	0.011 (0.103)	0.096 (0.102)	-0.001 (0.007)	0.014 (0.126)
	high	-0.855 ° (0.513)	-0.772 ** (0.253)	-0.688 (0.573)	-0.417 ° (0.245)	-0.027 (0.047)	0.079 (0.189)	-0.137 (0.093)	-0.096 * (0.046)	-0.041 (0.099)	0.183 (0.116)	-0.002 (0.018)	-0.050 (0.121)
Trade services and food	low	-1.703 ** (0.553)	-0.943 ** (0.294)	-0.183 (0.592)	-0.623 * (0.292)	-0.036 (0.062)	0.045 (0.190)	-0.204 ° (0.119)	-0.127 * (0.055)	-0.024 (0.100)	0.274 ° (0.144)	-0.003 (0.023)	-0.029 (0.122)
	high	-0.876 (0.556)	-0.704 ** (0.237)	-0.532 (0.497)	-0.013 (0.229)	-0.001 (0.011)	0.012 (0.162)	-0.004 (0.075)	-0.005 (0.039)	-0.006 (0.085)	0.006 (0.100)	0.000 (0.001)	-0.008 (0.104)
Recreation service	low	-1.311 * (0.634)	-0.511 ° (0.306)	0.289 (0.626)	-0.338 (0.274)	-0.012 (0.024)	-0.090 (0.209)	-0.111 (0.098)	-0.042 (0.051)	0.047 (0.109)	0.148 (0.125)	-0.001 (0.008)	0.058 (0.133)
	high	-1.268 (0.834)	-1.136 ** (0.353)	-1.004 ° (0.544)	-0.298 (0.360)	-0.026 (0.046)	0.147 (0.198)	-0.097 (0.122)	-0.090 (0.059)	-0.077 (0.101)	0.131 (0.161)	-0.002 (0.017)	-0.095 (0.124)
Knowledge intensive production	low	-1.410 ** (0.538)	-0.683 * (0.302)	0.043 (0.577)	-0.264 (0.237)	-0.010 (0.022)	-0.058 (0.197)	-0.086 (0.083)	-0.036 (0.049)	0.030 (0.103)	0.116 (0.108)	-0.001 (0.007)	0.037 (0.126)
	high	-1.168 * (0.580)	-0.964 ** (0.341)	-0.759 (0.780)	-0.372 (0.263)	-0.027 (0.049)	0.115 (0.269)	-0.122 (0.096)	-0.096 (0.060)	-0.060 (0.140)	0.163 (0.122)	-0.002 (0.018)	-0.074 (0.171)
Health service	low	-0.930 ° (0.531)	-0.855 ** (0.270)	-0.781 (0.616)	-0.297 (0.229)	-0.030 (0.053)	0.222 (0.238)	-0.097 (0.082)	-0.108 * (0.049)	-0.116 (0.119)	0.130 (0.105)	-0.002 (0.020)	-0.142 (0.145)
	high	-1.649 ** (0.567)	-0.792 ** (0.277)	0.065 (0.564)	-0.340 (0.255)	-0.007 (0.017)	-0.164 (0.213)	-0.111 (0.092)	-0.024 (0.045)	0.086 (0.108)	0.149 (0.117)	-0.001 (0.005)	0.106 (0.132)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A3: Primary and related production – Continued 5

Interaction with	Level	Primary and related production											
		Population development via joblessness			Population development via joblessness and taxes			Population development via wages and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		1.303 *** (0.351)	0.274 * (0.116)	-0.698 * (0.277)	-0.174 (0.115)	0.001 (0.008)	-0.201 ° (0.113)	-0.062 (0.055)	-0.001 (0.007)	-0.115 (0.094)	-0.273 (0.177)	0.000 (0.004)	-0.225 (0.196)
Professional service	low	1.332 *** (0.360)	0.358 ** (0.131)	-0.562 * (0.232)	-0.178 (0.117)	0.001 (0.011)	-0.161 ° (0.093)	0.035 (0.053)	-0.001 (0.010)	-0.091 (0.075)	0.009 (0.184)	-0.002 (0.014)	-0.193 (0.182)
	high	1.275 ** (0.414)	0.190 (0.208)	-0.834 ° (0.468)	-0.170 (0.117)	0.001 (0.006)	-0.240 (0.165)	-0.159 (0.096)	0.000 (0.003)	-0.139 (0.123)	-0.554 * (0.272)	0.003 (0.023)	-0.256 (0.328)
Simple production	low	1.679 *** (0.459)	0.272 (0.188)	-1.056 ** (0.388)	-0.224 (0.148)	0.001 (0.008)	-0.304 ° (0.165)	-0.026 (0.065)	-0.001 (0.006)	-0.079 (0.075)	-0.404 ° (0.241)	0.001 (0.012)	-0.258 (0.249)
	high	0.927 * (0.368)	0.276 * (0.134)	-0.340 (0.254)	-0.124 (0.089)	0.001 (0.008)	-0.098 (0.083)	-0.098 (0.078)	-0.001 (0.008)	-0.151 (0.120)	-0.142 (0.220)	0.000 (0.004)	-0.191 (0.206)
Large scale production	low	1.593 *** (0.439)	0.459 ** (0.149)	-0.611 ° (0.333)	-0.212 (0.141)	0.002 (0.014)	-0.176 (0.119)	-0.057 (0.065)	0.000 (0.004)	-0.080 (0.075)	-0.401 ° (0.236)	0.001 (0.008)	-0.310 (0.258)
	high	1.013 ** (0.351)	0.088 (0.138)	-0.785 * (0.342)	-0.135 (0.094)	0.000 (0.003)	-0.226 ° (0.134)	-0.066 (0.067)	-0.001 (0.010)	-0.150 (0.122)	-0.145 (0.196)	0.000 (0.002)	-0.139 (0.228)
Trade services and food	low	1.308 ** (0.404)	0.314 ° (0.162)	-0.624 ° (0.327)	-0.174 (0.118)	0.001 (0.009)	-0.179 (0.118)	-0.192 ° (0.105)	-0.001 (0.004)	-0.177 (0.141)	-0.323 (0.227)	0.002 (0.014)	-0.132 (0.235)
	high	1.298 ** (0.405)	0.234 ° (0.132)	-0.771 * (0.306)	-0.173 (0.118)	0.001 (0.007)	-0.222 ° (0.125)	0.069 (0.071)	-0.001 (0.009)	-0.054 (0.055)	-0.223 (0.219)	-0.001 (0.006)	-0.317 (0.225)
Recreation service	low	1.464 ** (0.455)	0.226 (0.170)	-0.942 * (0.380)	-0.195 (0.133)	0.001 (0.007)	-0.271 ° (0.154)	0.043 (0.073)	-0.001 (0.009)	-0.070 (0.070)	-0.231 (0.247)	0.000 (0.003)	-0.264 (0.261)
	high	1.142 * (0.510)	0.321 ° (0.191)	-0.454 (0.295)	-0.152 (0.114)	0.001 (0.010)	-0.130 (0.100)	-0.166 (0.122)	-0.001 (0.005)	-0.161 (0.129)	-0.315 (0.325)	0.001 (0.010)	-0.185 (0.222)
Knowledge intensive production	low	0.963 ** (0.356)	0.411 * (0.169)	-0.111 (0.302)	-0.128 (0.091)	0.001 (0.012)	-0.032 (0.088)	-0.040 (0.064)	0.000 (0.004)	-0.070 (0.069)	-0.520 * (0.255)	0.003 (0.023)	-0.211 (0.237)
	high	1.643 *** (0.466)	0.137 (0.188)	-1.284 ** (0.497)	-0.219 (0.146)	0.000 (0.004)	-0.369 ° (0.206)	-0.083 (0.076)	-0.001 (0.010)	-0.160 (0.136)	-0.026 (0.217)	-0.002 (0.015)	-0.238 (0.315)
Health service	low	1.110 ** (0.360)	0.139 (0.146)	-0.777 * (0.354)	-0.148 (0.101)	0.000 (0.004)	-0.223 (0.136)	0.075 (0.068)	-0.002 (0.013)	-0.092 (0.083)	-0.226 (0.209)	0.000 (0.004)	-0.191 (0.249)
	high	1.496 *** (0.442)	0.408 ** (0.156)	-0.619 ° (0.324)	-0.199 (0.134)	0.001 (0.012)	-0.178 (0.117)	-0.198 ° (0.109)	0.000 (0.001)	-0.138 (0.113)	-0.320 (0.233)	0.001 (0.005)	-0.258 (0.239)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A4: Large scale production

Interaction with	Level	Large scale production											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-0.121 (1.070)	0.397 (0.436)	0.916 (1.160)	-0.602 (0.452)	0.400 * (0.184)	1.403 ** (0.491)	0.013 (0.115)	-0.050 (0.056)	-0.132 (0.177)	-15.828 (24.529)	44.126 *** (10.001)	104.080 *** (26.777)
Professional service	low	-2.184 (1.492)	0.672 (0.683)	3.528 * (1.724)	-0.989 (0.632)	-0.326 (0.300)	0.337 (0.755)	0.234 (0.187)	-0.084 (0.088)	-0.509 (0.338)	-18.724 (34.517)	54.247 *** (16.353)	127.217 ** (40.665)
	high	1.941 ° (1.142)	0.123 (0.957)	-1.695 (2.226)	-0.215 (0.484)	1.127 ** (0.409)	2.468 ** (0.947)	-0.208 (0.150)	-0.015 (0.120)	0.244 (0.339)	-12.933 (26.066)	34.005 (22.311)	80.943 (51.586)
Simple production	low	-1.458 (1.216)	-0.395 (0.680)	0.669 (1.594)	-0.465 (0.514)	0.911 ** (0.287)	2.286 *** (0.674)	0.156 (0.146)	0.050 (0.086)	-0.096 (0.234)	-13.795 (27.799)	46.815 ** (15.725)	107.425 ** (36.850)
	high	1.215 (1.481)	1.189 * (0.477)	1.164 (1.555)	-0.739 (0.628)	-0.110 (0.205)	0.519 (0.665)	-0.130 (0.168)	-0.150 * (0.067)	-0.168 (0.236)	-17.861 (34.000)	41.437 *** (11.040)	100.735 ** (36.065)
Primary and related production	low	0.528 (1.262)	0.929 (0.640)	1.331 (1.824)	-1.225 * (0.537)	-0.010 (0.271)	1.205 (0.778)	-0.057 (0.137)	-0.117 (0.084)	-0.192 (0.277)	-18.251 (29.723)	57.601 *** (14.630)	133.452 ** (42.321)
	high	-0.771 (1.502)	-0.134 (0.583)	0.502 (1.201)	0.020 (0.635)	0.810 ** (0.246)	1.600 ** (0.509)	0.083 (0.165)	0.017 (0.073)	-0.072 (0.176)	-13.406 (34.200)	30.651 * (13.448)	74.708 ** (27.811)
Trade services and food	low	2.757 * (1.201)	0.962 (0.627)	-0.832 (1.675)	-0.419 (0.515)	0.959 *** (0.265)	2.338 ** (0.710)	-0.296 ° (0.177)	-0.121 (0.082)	0.120 (0.247)	-12.392 (27.897)	46.267 ** (14.536)	104.926 ** (38.876)
	high	-3.000 * (1.334)	-0.168 (0.498)	2.665 ° (1.420)	-0.785 (0.568)	-0.159 (0.211)	0.468 (0.602)	0.322 (0.195)	0.021 (0.063)	-0.384 (0.268)	-19.265 (30.758)	41.985 *** (11.417)	103.234 ** (32.453)
Recreation service	low	4.483 *** (1.350)	1.321 ° (0.676)	-1.841 (1.542)	-0.172 (0.582)	0.180 (0.288)	0.533 (0.652)	-0.481 ° (0.245)	-0.166 ° (0.091)	0.265 (0.252)	140.492 *** (31.775)	104.950 *** (15.501)	69.407 ° (35.527)
	high	-4.726 * (2.222)	-0.526 (0.804)	3.674 ° (1.976)	-1.032 (0.944)	0.620 ° (0.342)	2.272 ** (0.839)	0.507 (0.317)	0.066 (0.102)	-0.530 (0.372)	-172.149 *** (51.898)	-16.698 (18.504)	138.753 ** (46.420)
Knowledge intensive production	low	2.159 ° (1.175)	0.128 (0.589)	-1.903 (1.478)	-0.732 (0.498)	0.435 ° (0.249)	1.602 * (0.625)	-0.232 (0.158)	-0.016 (0.074)	0.274 (0.246)	-66.749 * (27.006)	26.738 * (13.491)	120.226 *** (33.951)
	high	-2.402 ° (1.259)	0.666 (0.561)	3.735 * (1.618)	-0.473 (0.534)	0.365 (0.239)	1.203 ° (0.691)	0.258 (0.172)	-0.084 (0.072)	-0.538 (0.337)	35.093 (28.924)	61.513 *** (12.896)	87.934 * (37.484)
Health service	low	-1.773 (1.344)	0.344 (0.501)	2.462 (1.510)	-0.671 (0.569)	0.290 (0.212)	1.252 ° (0.641)	0.190 (0.164)	-0.043 (0.064)	-0.355 (0.270)	-25.116 (30.772)	56.563 *** (11.439)	138.243 *** (34.714)
	high	1.530 (1.316)	0.450 (0.604)	-0.630 (1.447)	-0.533 (0.556)	0.510 * (0.255)	1.554 * (0.611)	-0.164 (0.157)	-0.057 (0.077)	0.091 (0.213)	-6.540 (30.160)	31.688 * (13.823)	69.917 * (33.270)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A4: Large scale production – Continued 1

Interaction with	Level	Large scale production											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-35.882 (23.275)	-25.216 ** (9.460)	-14.550 (26.101)	-0.696 (6.140)	1.502 (1.754)	1.679 (4.264)	-0.284 (2.507)	0.629 (0.714)	0.449 (0.897)	13.120 (10.364)	-5.041 * (2.544)	-4.767 (7.248)
Professional service	low	-18.940 (32.361)	-11.114 (15.428)	-3.287 (39.401)	-12.511 (10.184)	2.541 (2.775)	6.464 (14.580)	-5.108 (4.263)	1.064 (1.124)	1.728 (2.804)	21.560 (14.752)	4.107 (3.869)	-1.146 (3.075)
	high	-52.825 * (24.518)	-39.318 ° (20.597)	-25.812 (47.705)	11.119 (8.186)	0.464 (3.623)	-3.106 (7.964)	4.540 (3.446)	0.195 (1.517)	-0.831 (1.685)	4.680 (10.607)	-14.190 * (5.923)	-8.388 (12.822)
Simple production	low	-12.344 (26.116)	-15.154 (14.631)	-17.964 (34.708)	-8.351 (7.886)	-1.492 (2.637)	1.225 (3.976)	-3.410 (3.281)	-0.625 (1.091)	0.328 (0.931)	10.125 (11.482)	-11.469 ** (4.318)	-7.769 (11.720)
	high	-59.421 ° (31.858)	-35.278 *** (10.424)	-11.136 (34.614)	6.960 (9.024)	4.497 ° (2.541)	2.133 (5.492)	2.841 (3.721)	1.884 * (0.927)	0.570 (1.165)	16.115 (14.237)	1.387 (2.594)	-1.765 (3.453)
Primary and related production	low	-60.123 * (27.602)	-36.204 ** (13.783)	-12.286 (39.915)	3.023 (7.354)	3.513 (2.793)	2.438 (6.324)	1.234 (3.011)	1.472 (1.096)	0.652 (1.347)	26.686 * (13.409)	0.126 (3.420)	-4.094 (6.609)
	high	-11.641 (32.362)	-14.227 (12.452)	-16.814 (27.030)	-4.415 (8.825)	-0.508 (2.213)	0.920 (2.991)	-1.803 (3.618)	-0.213 (0.925)	0.246 (0.701)	-0.447 (13.833)	-10.208 ** (3.745)	-5.440 (8.232)
Trade services and food	low	-39.918 (26.760)	-23.446 ° (13.572)	-6.974 (37.260)	15.796 (9.807)	3.639 (2.776)	-1.525 (4.550)	6.449 (4.177)	1.524 (1.083)	-0.408 (1.035)	9.131 (11.452)	-12.083 ** (4.166)	-7.945 (12.000)
	high	-31.846 (28.549)	-26.986 * (10.703)	-22.126 (30.645)	-17.188 (10.782)	-0.634 (1.900)	4.883 (11.063)	-7.017 (4.589)	-0.265 (0.793)	1.306 (2.136)	17.109 (13.070)	2.000 (2.692)	-1.589 (3.117)
Recreation service	low	-55.858 ° (31.557)	-22.686 (15.116)	10.487 (34.080)	25.682 ° (13.746)	4.993 (3.237)	-3.374 (7.949)	10.485 ° (5.937)	2.092 ° (1.225)	-0.902 (1.587)	3.757 (12.720)	-2.272 (3.653)	-1.812 (3.479)
	high	-15.906 (48.447)	-27.746 (17.122)	-39.586 (43.487)	-27.073 (17.478)	-1.988 (3.141)	6.732 (15.260)	-11.053 (7.422)	-0.833 (1.295)	1.800 (2.948)	22.483 (21.292)	-7.811 ° (4.595)	-7.722 (11.775)
Knowledge intensive production	low	-88.196 *** (25.535)	-55.339 *** (12.548)	-22.482 (32.692)	12.371 (8.674)	0.485 (2.236)	-3.487 (8.140)	5.051 (3.662)	0.203 (0.935)	-0.932 (1.613)	15.942 (11.545)	-5.484 (3.332)	-5.446 (8.333)
	high	16.432 (27.399)	4.907 (12.217)	-6.617 (35.297)	-13.763 (9.439)	2.520 (2.345)	6.845 (15.360)	-5.619 (3.991)	1.055 (0.938)	1.830 (2.939)	10.298 (11.908)	-4.598 (3.152)	-4.088 (6.488)
Health service	low	-20.409 (28.912)	-18.391 ° (10.894)	-16.372 (33.459)	-10.160 (8.915)	1.302 (1.965)	4.512 (10.313)	-4.148 (3.720)	0.545 (0.809)	1.206 (2.007)	14.624 (12.914)	-3.656 (2.772)	-4.254 (6.660)
	high	-51.355 ° (28.285)	-32.041 * (12.810)	-12.727 (31.479)	8.768 (8.480)	1.703 (2.381)	-1.154 (3.673)	3.580 (3.525)	0.713 (0.978)	-0.309 (0.855)	11.616 (12.456)	-6.427 ° (3.475)	-5.280 (8.084)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A4: Large scale production – Continued 2

Interaction with	Level	Large scale production														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-14.019 (16.891)	-21.843 ** (6.995)	-1.973 (3.139)	4.404 (4.130)	-4.341 * (2.144)	-20.161 * (8.842)	2.865 (2.495)	-0.718 ° (0.414)	-0.317 (0.693)	-3.325 (5.261)	7.601 ** (2.366)	13.996 (9.905)	-7.836 (5.839)	-3.592 * (1.681)	-0.967 (2.306)
Professional service	low	-22.425 (23.383)	1.326 (11.159)	1.667 (3.277)	7.237 (6.157)	3.536 (3.312)	-4.846 (10.926)	4.708 (3.655)	0.585 (0.575)	-0.076 (0.237)	-3.933 (7.359)	9.345 ** (3.451)	17.107 (12.535)	-4.136 (7.228)	-1.583 (2.242)	-0.219 (2.642)
	high	-5.613 (17.922)	-45.011 ** (15.067)	-5.613 (8.737)	1.571 (3.648)	-12.218 * (4.941)	-35.476 * (16.536)	1.022 (2.346)	-2.021 * (1.016)	-0.558 (1.222)	-2.717 (5.544)	5.858 (4.041)	10.884 (9.981)	-11.535 ° (6.825)	-5.600 ° (3.326)	-1.716 (4.161)
Simple production	low	-14.634 (18.889)	-15.322 (10.725)	-1.065 (2.166)	3.399 (4.220)	-9.875 ** (3.575)	-32.857 * (13.008)	2.211 (2.635)	-1.634 * (0.766)	-0.517 (1.124)	-2.898 (5.913)	8.065 * (3.209)	14.445 (10.736)	-2.696 (5.788)	-2.158 (2.170)	-1.194 (2.973)
	high	-13.403 (23.139)	-28.363 *** (7.667)	-2.881 (4.679)	5.409 (5.506)	1.194 (2.230)	-7.465 (9.755)	3.519 (3.366)	0.197 (0.374)	-0.117 (0.294)	-3.752 (7.242)	7.138 ** (2.436)	13.546 (10.163)	-12.976 (8.430)	-5.025 * (2.045)	-0.740 (2.578)
Primary and related production	low	1.043 (20.393)	-19.174 ° (10.083)	-2.619 (4.227)	8.958 (6.385)	0.108 (2.944)	-17.316 (12.082)	5.828 (3.626)	0.018 (0.487)	-0.272 (0.613)	-3.834 (6.363)	9.923 ** (3.291)	17.945 (13.130)	-13.129 ° (7.716)	-5.157 * (2.437)	-0.817 (2.947)
	high	-29.080 (23.441)	-24.512 ** (9.130)	-1.326 (2.376)	-0.150 (4.644)	-8.790 ** (3.094)	-23.006 * (9.511)	-0.098 (3.021)	-1.454 * (0.671)	-0.362 (0.789)	-2.816 (7.241)	5.280 * (2.576)	10.046 (7.607)	-2.542 (7.128)	-2.026 (1.862)	-1.118 (2.512)
Trade services and food	low	-6.379 (19.421)	-26.887 ** (9.978)	-3.151 (4.994)	3.065 (4.145)	-10.403 ** (3.422)	-33.602 * (13.528)	1.994 (2.606)	-1.721 * (0.764)	-0.528 (1.151)	-2.603 (5.919)	7.970 ** (3.027)	14.109 (10.671)	-8.717 (6.662)	-3.339 (2.147)	-0.464 (2.582)
	high	-21.659 (20.667)	-16.799 * (7.827)	-0.794 (1.834)	5.743 (5.261)	1.722 (2.311)	-6.720 (8.834)	3.736 (3.166)	0.285 (0.392)	-0.106 (0.265)	-4.047 (6.590)	7.233 ** (2.499)	13.882 (10.140)	-6.954 (6.736)	-3.844 * (1.866)	-1.471 (3.079)
Recreation service	low	-65.112 ** (23.252)	-32.014 ** (10.967)	0.072 (1.700)	1.261 (4.317)	-1.956 (3.139)	-7.664 (9.591)	0.820 (2.794)	-0.324 (0.528)	-0.121 (0.299)	29.512 * (11.564)	18.079 *** (4.690)	9.333 (7.790)	-12.198 (8.217)	-3.231 (2.335)	0.697 (2.516)
	high	37.075 (35.062)	-11.672 (12.529)	-4.017 (6.533)	7.547 (8.102)	-6.725 ° (3.895)	-32.658 * (14.834)	4.910 (4.986)	-1.112 (0.725)	-0.513 (1.123)	-36.162 * (15.898)	-2.877 (3.246)	18.658 (13.795)	-3.473 (10.656)	-3.952 (2.678)	-2.632 (5.042)
Knowledge intensive production	low	-13.634 (18.961)	-9.138 (9.361)	-0.309 (1.579)	5.351 (4.726)	-4.722 ° (2.827)	-23.034 * (10.851)	3.481 (2.826)	-0.781 (0.523)	-0.362 (0.794)	-14.022 ° (7.233)	4.606 ° (2.523)	16.167 (11.596)	-19.260 * (9.001)	-7.882 ** (2.840)	-1.495 (3.198)
	high	-14.403 (19.822)	-34.548 *** (8.913)	-3.637 (5.857)	3.457 (4.363)	-3.959 (2.683)	-17.288 (10.933)	2.249 (2.728)	-0.655 (0.485)	-0.272 (0.607)	7.372 (6.518)	10.597 *** (3.169)	11.824 (9.284)	3.588 (6.126)	0.699 (1.751)	-0.440 (2.446)
Health service	low	-9.117 (20.897)	-18.621 * (7.951)	-1.870 (3.222)	4.909 (4.995)	-3.148 (2.364)	-17.990 ° (10.367)	3.193 (3.054)	-0.521 (0.421)	-0.283 (0.627)	-5.276 (6.681)	9.744 *** (2.864)	18.589 (13.116)	-4.457 (6.522)	-2.619 (1.716)	-1.089 (2.805)
	high	-18.920 (20.590)	-25.065 ** (9.437)	-2.075 (3.328)	3.899 (4.623)	-5.534 ° (2.937)	-22.332 * (10.586)	2.537 (2.875)	-0.915 (0.557)	-0.351 (0.770)	-1.374 (6.351)	5.459 * (2.651)	9.402 (7.645)	-11.215 (7.422)	-4.564 * (2.227)	-0.846 (2.479)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A4: Large scale production – Continued 3

Interaction with	Level	Large scale production											
		Tax via GDP			Tax via GDP and joblessness			Tax via GDP and wages			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-0.960 (8.459)	3.321 (3.670)	8.077 (10.566)	-0.095 (0.843)	0.542 (0.612)	1.899 (2.599)	-0.080 (0.706)	0.929 (1.043)	2.959 (4.247)	-0.062 (0.548)	0.090 (0.105)	0.030 (0.076)
Professional service	low	-17.251 (12.462)	5.616 (5.759)	31.099 ° (18.361)	-1.715 (1.673)	0.916 (0.963)	7.310 (5.230)	-1.434 (1.598)	1.571 (1.641)	11.394 (9.513)	-1.115 (1.017)	0.152 (0.166)	0.115 (0.259)
	high	15.332 (9.712)	1.026 (8.000)	-14.944 (20.240)	1.524 (1.390)	0.167 (1.306)	-3.513 (4.965)	1.274 (1.350)	0.287 (2.239)	-5.475 (8.089)	0.991 (0.836)	0.028 (0.216)	-0.055 (0.142)
Simple production	low	-11.515 (9.980)	-3.297 (5.695)	5.894 (14.186)	-1.145 (1.244)	-0.538 (0.938)	1.386 (3.381)	-0.957 (1.161)	-0.922 (1.604)	2.160 (5.351)	-0.745 (0.767)	-0.089 (0.157)	0.022 (0.071)
	high	9.596 (11.911)	9.940 * (4.196)	10.260 (14.118)	0.954 (1.339)	1.622 * (0.780)	2.412 (3.459)	0.798 (1.199)	2.781 * (1.295)	3.759 (5.629)	0.620 (0.844)	0.268 ° (0.152)	0.038 (0.098)
Primary and related production	low	4.169 (10.018)	7.766 (5.441)	11.730 (16.537)	0.414 (1.032)	1.267 (0.935)	2.757 (4.044)	0.347 (0.883)	2.173 (1.581)	4.298 (6.569)	0.270 (0.665)	0.210 (0.167)	0.043 (0.112)
	high	-6.088 (11.952)	-1.123 (4.874)	4.425 (10.690)	-0.605 (1.252)	-0.183 (0.796)	1.040 (2.548)	-0.506 (1.082)	-0.314 (1.365)	1.621 (4.032)	-0.394 (0.803)	-0.030 (0.132)	0.016 (0.053)
Trade services and food	low	21.781 * (10.776)	8.043 (5.342)	-7.338 (14.965)	2.165 (1.779)	1.312 (0.923)	-1.725 (3.586)	1.810 (1.779)	2.250 (1.558)	-2.689 (5.708)	1.408 (1.048)	0.217 (0.166)	-0.027 (0.081)
	high	-23.700 * (11.916)	-1.401 (4.167)	23.493 (14.738)	-2.355 (1.947)	-0.229 (0.682)	5.522 (4.121)	-1.970 (1.943)	-0.392 (1.168)	8.607 (7.415)	-1.532 (1.149)	-0.038 (0.113)	0.087 (0.197)
Recreation service	low	35.411 ** (13.521)	11.037 ° (5.832)	-16.233 (14.618)	3.519 (2.672)	1.801 ° (1.038)	-3.816 (3.766)	2.943 (2.739)	3.088 ° (1.741)	-5.947 (6.404)	2.290 (1.545)	0.298 (0.193)	-0.060 (0.141)
	high	-37.330 ° (19.613)	-4.395 (6.744)	32.387 (20.459)	-3.710 (3.118)	-0.717 (1.113)	7.613 (5.709)	-3.103 (3.097)	-1.229 (1.902)	11.866 (10.260)	-2.414 (1.847)	-0.119 (0.187)	0.120 (0.271)
Knowledge intensive production	low	17.058 ° (10.105)	1.073 (4.926)	-16.773 (14.160)	1.695 (1.499)	0.175 (0.805)	-3.943 (3.690)	1.418 (1.468)	0.300 (1.379)	-6.145 (6.331)	1.103 (0.896)	0.029 (0.133)	-0.062 (0.145)
	high	-18.978 ° (10.896)	5.570 (4.743)	32.927 ° (17.953)	-1.886 (1.644)	0.909 (0.802)	7.740 (5.253)	-1.577 (1.616)	1.558 (1.362)	12.064 (9.695)	-1.227 (0.981)	0.150 (0.140)	0.122 (0.273)
Health service	low	-14.009 (11.113)	2.878 (4.207)	21.705 (15.125)	-1.392 (1.433)	0.470 (0.695)	5.102 (4.110)	-1.164 (1.353)	0.805 (1.188)	7.953 (7.263)	-0.906 (0.878)	0.078 (0.117)	0.080 (0.183)
	high	12.090 (10.778)	3.764 (5.070)	-5.551 (12.891)	1.202 (1.330)	0.614 (0.839)	-1.305 (3.076)	1.005 (1.237)	1.053 (1.433)	-2.034 (4.873)	0.782 (0.821)	0.102 (0.142)	-0.021 (0.065)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A4: Large scale production – Continued 4

Interaction with	Level	Large scale production											
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-0.435 (0.387)	-0.307 ° (0.160)	-0.178 (0.434)	-0.018 (0.162)	0.006 (0.013)	-0.110 (0.154)	-0.006 (0.053)	0.022 (0.025)	0.058 (0.078)	0.008 (0.071)	0.000 (0.004)	0.070 (0.096)
Professional service	low	-0.824 (0.541)	-0.469 ° (0.251)	-0.113 (0.653)	-0.331 (0.248)	0.011 (0.021)	-0.422 (0.327)	-0.108 (0.089)	0.038 (0.039)	0.222 (0.156)	0.145 (0.114)	0.001 (0.007)	0.271 (0.190)
	high	-0.046 (0.404)	-0.144 (0.344)	-0.242 (0.793)	0.294 (0.195)	0.002 (0.016)	0.203 (0.293)	0.096 (0.072)	0.007 (0.054)	-0.107 (0.150)	-0.129 (0.091)	0.000 (0.002)	-0.130 (0.183)
Simple production	low	-0.372 (0.427)	-0.480 ° (0.248)	-0.587 (0.577)	-0.221 (0.196)	-0.006 (0.015)	-0.080 (0.197)	-0.072 (0.069)	-0.022 (0.039)	0.042 (0.102)	0.097 (0.089)	0.000 (0.004)	0.051 (0.125)
	high	-0.499 (0.531)	-0.134 (0.178)	0.231 (0.587)	0.184 (0.231)	0.019 (0.033)	-0.139 (0.204)	0.060 (0.079)	0.067 * (0.031)	0.073 (0.104)	-0.081 (0.103)	0.001 (0.012)	0.089 (0.128)
Primary and related production	low	-0.866 ° (0.466)	-0.358 (0.228)	0.150 (0.664)	0.080 (0.193)	0.015 (0.027)	-0.159 (0.238)	0.026 (0.064)	0.052 (0.038)	0.084 (0.122)	-0.035 (0.085)	0.001 (0.010)	0.102 (0.149)
	high	-0.005 (0.532)	-0.255 (0.209)	-0.506 (0.441)	-0.117 (0.230)	-0.002 (0.010)	-0.060 (0.148)	-0.038 (0.077)	-0.008 (0.033)	0.032 (0.077)	0.051 (0.102)	0.000 (0.002)	0.039 (0.094)
Trade services and food	low	-0.271 (0.439)	-0.342 (0.229)	-0.412 (0.617)	0.418 ° (0.222)	0.015 (0.028)	0.100 (0.209)	0.137 (0.087)	0.054 (0.037)	-0.052 (0.109)	-0.183 ° (0.107)	0.001 (0.010)	-0.064 (0.133)
	high	-0.599 (0.476)	-0.272 (0.177)	0.056 (0.513)	-0.455 ° (0.245)	-0.003 (0.009)	-0.319 (0.256)	-0.149 (0.096)	-0.009 (0.028)	0.167 (0.123)	0.200 ° (0.118)	0.000 (0.002)	0.205 (0.150)
Recreation service	low	0.593 (0.530)	-0.379 (0.253)	-1.352 * (0.569)	0.679 * (0.292)	0.021 (0.037)	0.220 (0.227)	0.222 ° (0.123)	0.075 ° (0.042)	-0.116 (0.113)	-0.298 * (0.146)	0.002 (0.014)	-0.141 (0.138)
	high	-1.464 ° (0.798)	-0.234 (0.282)	0.996 (0.724)	-0.716 ° (0.402)	-0.008 (0.019)	-0.439 (0.355)	-0.234 (0.155)	-0.030 (0.046)	0.231 (0.170)	0.314 (0.191)	-0.001 (0.006)	0.282 (0.208)
Knowledge intensive production	low	-0.143 (0.428)	-0.467 * (0.212)	-0.792 (0.544)	0.327 (0.204)	0.002 (0.010)	0.227 (0.224)	0.107 (0.077)	0.007 (0.033)	-0.120 (0.111)	-0.144 (0.096)	0.000 (0.002)	-0.146 (0.135)
	high	-0.728 (0.461)	-0.146 (0.205)	0.436 (0.585)	-0.364 (0.221)	0.011 (0.020)	-0.447 (0.332)	-0.119 (0.083)	0.038 (0.033)	0.235 (0.156)	0.160 (0.104)	0.001 (0.007)	0.287 (0.191)
Health service	low	-0.918 ° (0.480)	-0.244 (0.180)	0.431 (0.556)	-0.269 (0.220)	0.006 (0.012)	-0.294 (0.253)	-0.088 (0.078)	0.019 (0.029)	0.155 (0.123)	0.118 (0.100)	0.000 (0.004)	0.189 (0.150)
	high	0.047 (0.466)	-0.370 ° (0.217)	-0.786 (0.523)	0.232 (0.212)	0.007 (0.016)	0.075 (0.179)	0.076 (0.074)	0.025 (0.035)	-0.040 (0.093)	-0.102 (0.096)	0.001 (0.005)	-0.048 (0.114)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A4: Large scale production – Continued 5

Interaction with	Level	Large scale production											
		Population development via joblessness			Population development via joblessness and taxes			Population development via wages and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.278 (0.217)	-0.180 * (0.085)	-0.611 * (0.255)	-0.037 (0.037)	-0.001 (0.005)	-0.176 ° (0.102)	0.028 (0.045)	0.001 (0.009)	0.122 (0.098)	0.118 (0.147)	-0.003 (0.027)	-0.259 (0.194)
Professional service	low	0.457 (0.308)	0.146 (0.135)	-0.147 (0.331)	-0.061 (0.055)	0.001 (0.004)	-0.042 (0.097)	0.033 (0.063)	0.001 (0.012)	0.149 (0.123)	0.189 (0.205)	0.000 (0.002)	0.219 (0.262)
	high	0.099 (0.225)	-0.506 ** (0.191)	-1.076 * (0.480)	-0.013 (0.031)	-0.002 (0.015)	-0.309 ° (0.186)	0.023 (0.047)	0.001 (0.007)	0.095 (0.094)	0.047 (0.152)	-0.007 (0.056)	-0.736 ° (0.413)
Simple production	low	0.215 (0.242)	-0.409 ** (0.135)	-0.996 ** (0.371)	-0.029 (0.037)	-0.001 (0.012)	-0.286 ° (0.157)	0.024 (0.050)	0.001 (0.010)	0.126 (0.105)	0.123 (0.163)	-0.002 (0.019)	-0.140 (0.228)
	high	0.342 (0.299)	0.049 (0.092)	-0.226 (0.294)	-0.046 (0.048)	0.000 (0.002)	-0.065 (0.089)	0.032 (0.062)	0.001 (0.009)	0.118 (0.099)	0.113 (0.198)	-0.004 (0.035)	-0.378 (0.261)
Primary and related production	low	0.566 * (0.276)	0.004 (0.122)	-0.525 (0.360)	-0.075 (0.059)	0.000 (0.000)	-0.151 (0.120)	0.032 (0.054)	0.001 (0.012)	0.156 (0.129)	-0.009 (0.172)	-0.003 (0.024)	-0.343 (0.287)
	high	-0.009 (0.293)	-0.364 ** (0.117)	-0.698 * (0.273)	0.001 (0.039)	-0.001 (0.011)	-0.200 ° (0.113)	0.024 (0.061)	0.001 (0.007)	0.088 (0.074)	0.245 (0.211)	-0.004 (0.030)	-0.174 (0.183)
Trade services and food	low	0.194 (0.242)	-0.431 *** (0.127)	-1.019 ** (0.387)	-0.026 (0.036)	-0.002 (0.013)	-0.293 ° (0.162)	0.022 (0.050)	0.001 (0.010)	0.123 (0.104)	0.054 (0.164)	-0.004 (0.033)	-0.413 (0.285)
	high	0.363 (0.274)	0.071 (0.095)	-0.204 (0.267)	-0.048 (0.047)	0.000 (0.002)	-0.059 (0.080)	0.034 (0.056)	0.001 (0.009)	0.121 (0.100)	0.182 (0.183)	-0.002 (0.021)	-0.104 (0.198)
Recreation service	low	0.080 (0.270)	-0.081 (0.129)	-0.232 (0.289)	-0.011 (0.036)	0.000 (0.002)	-0.067 (0.087)	-0.249 * (0.124)	0.003 (0.022)	0.081 (0.075)	0.548 * (0.258)	-0.005 (0.040)	0.009 (0.219)
	high	0.477 (0.448)	-0.278 ° (0.156)	-0.990 * (0.430)	-0.064 (0.071)	-0.001 (0.008)	-0.285 ° (0.168)	0.305 ° (0.163)	0.000 (0.004)	0.163 (0.135)	-0.312 (0.310)	-0.002 (0.015)	-0.527 (0.339)
Knowledge intensive production	low	0.338 (0.241)	-0.195 ° (0.114)	-0.698 * (0.316)	-0.045 (0.042)	-0.001 (0.006)	-0.201 ° (0.121)	0.118 ° (0.071)	0.001 (0.006)	0.141 (0.114)	0.115 (0.164)	-0.001 (0.011)	-0.040 (0.211)
	high	0.218 (0.251)	-0.164 (0.108)	-0.524 (0.324)	-0.029 (0.038)	-0.001 (0.005)	-0.151 (0.111)	-0.062 (0.058)	0.002 (0.013)	0.103 (0.090)	0.121 (0.171)	-0.005 (0.043)	-0.477 ° (0.287)
Health service	low	0.310 (0.271)	-0.130 (0.096)	-0.546 ° (0.306)	-0.041 (0.044)	0.000 (0.004)	-0.157 (0.108)	0.044 (0.058)	0.001 (0.012)	0.162 (0.130)	0.077 (0.178)	-0.003 (0.023)	-0.245 (0.231)
	high	0.246 (0.262)	-0.229 ° (0.117)	-0.677 * (0.308)	-0.033 (0.040)	-0.001 (0.007)	-0.195 (0.118)	0.012 (0.054)	0.001 (0.007)	0.082 (0.074)	0.159 (0.180)	-0.004 (0.031)	-0.272 (0.227)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A5: Trade service and food

Interaction with	Level	Trade service and food											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-5.253 *** (1.232)	-3.114 *** (0.468)	-0.975 (1.265)	-0.091 (0.535)	-0.709 *** (0.209)	-1.327 * (0.538)	0.564 * (0.267)	0.392 *** (0.097)	0.141 (0.193)	-96.293 ** (29.737)	-84.234 *** (11.435)	-72.174 * (30.281)
Professional service	low	-6.240 *** (1.665)	-2.565 *** (0.719)	1.111 (1.675)	-0.044 (0.717)	-0.277 (0.309)	-0.510 (0.712)	0.670 * (0.329)	0.322 ** (0.110)	-0.160 (0.252)	-109.739 ** (39.846)	-76.278 *** (16.692)	-42.818 (39.335)
	high	-4.265 ** (1.532)	-3.663 *** (0.832)	-3.062 (2.041)	-0.138 (0.656)	-1.141 ** (0.360)	-2.144 * (0.865)	0.458 ° (0.250)	0.461 *** (0.138)	0.441 (0.355)	-82.848 * (35.672)	-92.189 *** (19.698)	-101.530 * (47.517)
Simple production	low	-4.144 ** (1.392)	-2.993 *** (0.676)	-1.841 (1.558)	-0.119 (0.594)	-0.500 ° (0.293)	-0.882 (0.659)	0.445 ° (0.236)	0.376 *** (0.113)	0.265 (0.254)	-68.619 * (32.550)	-58.675 *** (15.840)	-48.732 (35.885)
	high	-6.361 *** (1.847)	-3.235 *** (0.584)	-0.109 (1.652)	-0.063 (0.800)	-0.918 *** (0.257)	-1.772 * (0.707)	0.683 * (0.344)	0.407 *** (0.109)	0.016 (0.238)	-123.968 ** (43.973)	-109.792 *** (14.099)	-95.616 * (39.967)
Primary and related production	low	-7.325 *** (1.404)	-4.221 *** (0.647)	-1.118 (1.721)	-0.101 (0.617)	-0.801 ** (0.289)	-1.500 * (0.734)	0.786 * (0.357)	0.531 *** (0.132)	0.161 (0.259)	-20.361 (34.978)	-73.226 *** (15.739)	-126.091 ** (41.600)
	high	-3.181 ° (1.805)	-2.007 ** (0.711)	-0.833 (1.302)	-0.080 (0.766)	-0.617 * (0.303)	-1.154 * (0.550)	0.341 (0.239)	0.252 * (0.102)	0.120 (0.195)	-172.226 *** (41.420)	-95.242 *** (16.425)	-18.257 (30.020)
Large scale production	low	-2.268 (1.451)	-2.528 *** (0.583)	-2.788 ° (1.651)	0.099 (0.614)	-0.129 (0.253)	-0.357 (0.700)	0.243 (0.185)	0.318 ** (0.096)	0.402 (0.299)	-92.731 ** (33.918)	-82.014 *** (13.648)	-71.297 ° (38.781)
	high	-8.237 *** (1.389)	-3.700 *** (0.615)	0.838 (1.664)	-0.281 (0.623)	-1.289 *** (0.272)	-2.296 ** (0.709)	0.884 * (0.393)	0.465 *** (0.120)	-0.121 (0.246)	-99.856 ** (34.324)	-86.454 *** (15.083)	-73.051 ° (39.310)
Recreation service	low	-3.808 * (1.715)	-2.929 *** (0.736)	-2.051 (1.845)	-0.530 (0.733)	-0.778 * (0.318)	-1.026 (0.781)	0.409 (0.249)	0.368 ** (0.118)	0.296 (0.297)	-63.134 (39.602)	-74.152 *** (17.273)	-85.170 * (42.412)
	high	-6.698 ** (2.112)	-3.299 *** (0.757)	0.101 (1.825)	0.348 (0.903)	-0.640 ° (0.330)	-1.628 * (0.776)	0.719 ° (0.373)	0.415 *** (0.125)	-0.014 (0.263)	-129.453 ** (50.084)	-94.315 *** (17.856)	-59.178 (43.477)
Knowledge intensive production	low	-2.685 ° (1.388)	-2.562 *** (0.608)	-2.438 (1.643)	-1.067 ° (0.591)	-0.554 * (0.264)	-0.040 (0.704)	0.288 (0.190)	0.322 ** (0.099)	0.351 (0.285)	-123.285 *** (33.112)	-101.756 *** (14.311)	-80.227 * (38.779)
	high	-7.820 *** (1.744)	-3.666 *** (0.669)	0.488 (2.207)	0.885 (0.757)	-0.864 ** (0.294)	-2.614 ** (0.932)	0.839 * (0.393)	0.461 *** (0.124)	-0.070 (0.320)	-69.301 ° (41.318)	-66.711 *** (16.027)	-64.121 (51.266)
Health service	low	-2.776 ° (1.473)	-1.921 ** (0.596)	-1.067 (1.613)	-0.468 (0.624)	-0.668 ** (0.256)	-0.868 (0.683)	0.298 (0.200)	0.242 ** (0.089)	0.154 (0.243)	-92.606 ** (34.540)	-75.570 *** (13.935)	-58.533 (37.357)
	high	-7.730 *** (1.700)	-4.307 *** (0.691)	-0.884 (1.699)	0.286 (0.743)	-0.750 * (0.306)	-1.786 * (0.722)	0.830 * (0.387)	0.542 *** (0.137)	0.127 (0.252)	-99.980 * (40.654)	-92.898 *** (16.694)	-85.816 * (40.375)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A5: Trade service and food – Continued 1

Interaction with	Level	Trade service and food											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		21.608 (27.769)	0.672 (11.358)	-20.263 (28.417)	-30.092 * (15.068)	-11.773 * (5.007)	-1.787 (4.567)	-12.285 ° (6.557)	-4.932 ** (1.588)	-0.478 (0.965)	1.982 (11.664)	8.929 ** (3.211)	4.510 (6.919)
Professional service	low	-7.430 (37.030)	6.981 (15.848)	21.391 (36.475)	-35.750 ° (18.472)	-9.696 * (4.720)	2.036 (5.432)	-14.595 ° (8.009)	-4.062 * (1.623)	0.544 (1.176)	0.963 (15.630)	3.492 (3.963)	1.734 (3.528)
	high	50.645 (33.089)	-5.636 (18.697)	-61.917 (44.216)	-24.434 ° (13.925)	-13.850 * (6.346)	-5.610 (12.906)	-9.975 ° (5.976)	-5.802 ** (2.114)	-1.500 (2.526)	3.000 (14.311)	14.367 ** (5.417)	7.286 (11.173)
Simple production	low	23.815 (30.227)	-2.495 (14.995)	-28.805 (33.120)	-23.742 ° (13.187)	-11.315 * (5.176)	-3.374 (7.958)	-9.693 ° (5.674)	-4.740 ** (1.723)	-0.902 (1.590)	2.587 (12.968)	6.302 (3.910)	2.998 (4.968)
	high	19.400 (41.273)	3.840 (14.008)	-11.721 (37.750)	-36.442 ° (19.284)	-12.231 * (5.345)	-0.200 (3.060)	-14.878 ° (8.339)	-5.124 ** (1.728)	-0.054 (0.814)	1.377 (17.429)	11.557 ** (4.014)	6.023 (9.229)
Primary and related production	low	49.937 (32.262)	12.525 (15.082)	-24.888 (39.383)	-41.962 * (20.232)	-15.959 * (6.805)	-2.048 (5.504)	-17.132 ° (8.845)	-6.685 ** (2.162)	-0.548 (1.195)	2.210 (13.460)	10.086 * (4.191)	5.099 (7.946)
	high	-6.722 (38.971)	-11.180 (15.785)	-15.638 (27.677)	-18.222 (13.113)	-7.587 ° (4.042)	-1.526 (4.120)	-7.439 (5.527)	-3.178 * (1.445)	-0.408 (0.897)	1.753 (16.691)	7.772 ° (4.142)	3.921 (6.096)
Large scale production	low	17.423 (31.501)	2.507 (13.218)	-12.408 (35.892)	-12.993 (10.107)	-9.558 * (4.395)	-5.110 (11.650)	-5.305 (4.241)	-4.004 ** (1.467)	-1.366 (2.263)	-2.154 (13.397)	1.629 (3.204)	1.215 (2.983)
	high	25.792 (32.112)	-1.163 (14.562)	-28.118 (36.934)	-47.191 * (22.344)	-13.988 * (6.032)	1.535 (4.552)	-19.266 * (9.792)	-5.860 ** (1.932)	0.410 (1.033)	6.118 (13.650)	16.230 *** (4.785)	7.805 (11.797)
Recreation service	low	44.029 (36.552)	-2.593 (16.545)	-49.215 (39.839)	-21.814 (13.773)	-11.075 * (5.211)	-3.759 (8.940)	-8.906 (5.859)	-4.639 ** (1.762)	-1.005 (1.798)	11.545 (16.219)	9.798 * (4.482)	3.487 (5.802)
	high	-0.814 (46.507)	3.938 (17.026)	8.689 (40.122)	-38.370 ° (20.847)	-12.471 * (5.729)	0.184 (3.369)	-15.665 ° (8.989)	-5.224 ** (1.911)	0.049 (0.898)	-7.582 (19.776)	8.061 ° (4.473)	5.533 (8.601)
Knowledge intensive production	low	5.977 (31.167)	-12.984 (14.103)	-31.944 (36.357)	-15.381 (10.468)	-9.685 * (4.488)	-4.468 (10.288)	-6.280 (4.428)	-4.057 ** (1.504)	-1.195 (2.015)	23.251 (14.094)	6.972 ° (3.623)	0.137 (2.401)
	high	37.239 (38.133)	14.328 (15.156)	-8.582 (47.333)	-44.803 * (22.198)	-13.861 * (6.068)	0.894 (4.497)	-18.291 ° (9.672)	-5.807 ** (1.964)	0.239 (1.143)	-19.288 (17.164)	10.886 * (4.328)	8.884 (13.520)
Health service	low	22.268 (32.068)	-0.171 (13.363)	-22.609 (34.574)	-15.901 (10.985)	-7.263 * (3.664)	-1.954 (5.221)	-6.492 (4.642)	-3.043 * (1.281)	-0.523 (1.130)	10.192 (13.833)	8.410 * (3.659)	2.949 (4.942)
	high	20.947 (37.774)	1.515 (16.083)	-17.917 (37.868)	-44.283 * (21.878)	-16.283 * (6.985)	-1.620 (4.734)	-18.079 ° (9.536)	-6.821 ** (2.230)	-0.433 (1.068)	-6.228 (16.274)	9.449 * (4.323)	6.071 (9.311)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A5: Trade service and food – Continued 2

Interaction with	Level	Trade service and food											
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		20.681 (20.106)	11.213 (8.240)	1.745 (20.719)	0.665 (3.930)	7.688 ** (2.649)	19.074 * (9.237)	0.433 (2.552)	1.272 * (0.580)	0.300 (0.658)	-20.228 * (8.995)	-14.511 *** (3.668)	-9.705 (7.585)
Professional service	low	32.489 (26.798)	13.684 (11.515)	-5.120 (26.367)	0.323 (5.249)	3.006 (3.398)	7.334 (10.420)	0.210 (3.414)	0.497 (0.581)	0.115 (0.296)	-23.052 * (11.157)	-13.140 ** (4.015)	-5.758 (6.511)
	high	8.873 (24.307)	8.742 (13.509)	8.610 (32.358)	1.007 (4.831)	12.370 ** (4.486)	30.814 * (14.864)	0.655 (3.134)	2.046 * (0.961)	0.484 (1.063)	-17.403 ° (9.336)	-15.881 *** (4.794)	-13.653 (11.039)
Simple production	low	28.323 (21.972)	24.417 * (10.856)	20.512 (24.245)	0.868 (4.375)	5.426 (3.319)	12.677 (10.045)	0.565 (2.839)	0.898 (0.611)	0.199 (0.455)	-14.414 ° (8.248)	-10.108 ** (3.477)	-6.553 (6.477)
	high	13.039 (29.817)	-1.992 (10.151)	-17.022 (27.318)	0.462 (5.855)	9.951 ** (3.300)	25.471 * (12.197)	0.301 (3.808)	1.646 * (0.734)	0.400 (0.878)	-26.041 * (12.440)	-18.914 *** (4.708)	-12.857 (10.037)
Primary and related production	low	26.788 (23.379)	19.750 ° (10.938)	12.711 (28.539)	0.742 (4.534)	8.684 * (3.495)	21.564 ° (11.992)	0.483 (2.945)	1.437 * (0.720)	0.339 (0.750)	-4.277 (7.474)	-12.614 *** (3.819)	-16.955 (12.501)
	high	14.574 (28.214)	2.676 (11.428)	-9.221 (20.272)	0.588 (5.611)	6.692 ° (3.498)	16.584 ° (9.044)	0.383 (3.648)	1.107 ° (0.666)	0.261 (0.576)	-36.178 * (14.482)	-16.407 *** (4.500)	-2.455 (4.349)
Large scale production	low	28.602 (22.780)	5.984 (9.551)	-16.635 (25.971)	-0.723 (4.512)	1.402 (2.755)	5.139 (10.158)	-0.470 (2.931)	0.232 (0.461)	0.081 (0.235)	-19.479 * (9.467)	-14.128 *** (3.822)	-9.587 (8.195)
	high	12.760 (23.254)	16.442 (10.594)	20.125 (26.985)	2.054 (4.698)	13.974 *** (3.859)	33.010 * (13.415)	1.336 (3.021)	2.312 * (0.940)	0.519 (1.131)	-20.976 * (9.851)	-14.893 *** (4.104)	-9.823 (8.360)
Recreation service	low	1.752 (26.465)	-11.015 (11.975)	-23.783 (28.932)	3.875 (5.786)	8.436 * (3.759)	14.749 (11.881)	2.521 (3.660)	1.396 ° (0.748)	0.232 (0.530)	-13.262 (9.339)	-12.774 ** (4.034)	-11.453 (9.463)
	high	39.610 (33.621)	33.441 ** (12.323)	27.272 (29.141)	-2.545 (6.762)	6.940 ° (3.784)	23.400 ° (12.756)	-1.656 (4.361)	1.148 (0.714)	0.368 (0.813)	-27.193 * (13.653)	-16.247 *** (4.633)	-7.958 (7.855)
Knowledge intensive production	low	-19.902 (22.522)	22.203 * (10.197)	64.309 * (26.294)	7.805 (6.161)	6.003 * (3.058)	0.577 (10.117)	5.077 (3.598)	0.993 ° (0.586)	0.009 (0.160)	-25.898 * (10.819)	-17.529 *** (4.478)	-10.788 (8.820)
	high	61.264 * (27.744)	0.222 (11.066)	-60.819 ° (34.728)	-6.474 (6.626)	9.373 ** (3.598)	37.571 * (16.672)	-4.212 (4.054)	1.551 * (0.754)	0.591 (1.291)	-14.558 (9.851)	-11.492 ** (3.692)	-8.622 (8.936)
Health service	low	18.075 (23.326)	19.940 * (9.660)	21.804 (25.226)	3.421 (4.955)	7.241 * (3.061)	12.473 (10.353)	2.226 (3.129)	1.198 ° (0.620)	0.196 (0.450)	-19.453 * (9.560)	-13.018 *** (3.670)	-7.871 (7.223)
	high	23.287 (27.295)	2.486 (11.672)	-18.314 (27.429)	-2.091 (5.564)	8.135 * (3.626)	25.675 * (12.400)	-1.360 (3.589)	1.346 ° (0.722)	0.404 (0.886)	-21.002 ° (10.867)	-16.003 *** (4.463)	-11.540 (9.347)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A5: Trade service and food – Continued 3

Interaction with	Level	Trade service and food														
		Tax via GDP			Tax via GDP and household income			Tax via GDP and wages			Tax via GDP and joblessness			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-41.493 **	-26.024 ***	-8.597	-6.571	-1.677 *	-0.119	-3.449	-7.281 ***	-3.150	-4.124	-4.246 **	-2.021	-2.683	-0.702 *	-0.032
		(13.763)	(5.189)	(11.510)	(4.079)	(0.854)	(0.356)	(3.143)	(2.038)	(4.609)	(3.032)	(1.295)	(2.826)	(1.738)	(0.300)	(0.081)
Professional service	low	-49.295 **	-21.433 **	9.794	-7.807	-1.381 °	0.135	-4.097	-5.996 **	3.588	-4.899	-3.497 **	2.302	-3.187	-0.579 *	0.036
		(17.515)	(6.635)	(15.114)	(4.947)	(0.776)	(0.419)	(3.770)	(2.199)	(5.929)	(3.655)	(1.350)	(3.673)	(2.104)	(0.282)	(0.097)
	high	-33.691 *	-30.615 ***	-26.989	-5.336	-1.973 °	-0.373	-2.800	-8.565 **	-9.888	-3.348	-4.995 **	-6.344	-2.178	-0.826 *	-0.100
		(14.455)	(8.031)	(20.087)	(3.616)	(1.059)	(1.039)	(2.663)	(2.807)	(9.394)	(2.625)	(1.745)	(5.373)	(1.530)	(0.380)	(0.230)
Simple production	low	-32.737 *	-25.011 ***	-16.230	-5.185	-1.612 °	-0.224	-2.721	-6.997 **	-5.947	-3.254	-4.081 **	-3.815	-2.117	-0.675 *	-0.060
		(13.410)	(6.529)	(14.748)	(3.451)	(0.864)	(0.636)	(2.565)	(2.286)	(6.444)	(2.517)	(1.422)	(3.794)	(1.462)	(0.310)	(0.142)
	high	-50.248 **	-27.038 ***	-0.964	-7.958	-1.742 °	-0.013	-4.177	-7.564 ***	-0.353	-4.994	-4.412 **	-0.227	-3.249	-0.730 *	-0.004
		(18.755)	(6.035)	(14.570)	(5.124)	(0.904)	(0.205)	(3.873)	(2.250)	(5.342)	(3.770)	(1.417)	(3.426)	(2.176)	(0.320)	(0.054)
Primary and related production	low	-57.860 ***	-35.278 ***	-9.854	-9.163 °	-2.273 *	-0.136	-4.809	-9.869 ***	-3.611	-5.751	-5.756 **	-2.316	-3.741	-0.952 *	-0.036
		(17.526)	(7.117)	(15.520)	(5.552)	(1.160)	(0.424)	(4.334)	(2.780)	(6.073)	(4.155)	(1.764)	(3.766)	(2.370)	(0.407)	(0.098)
	high	-25.125	-16.770 **	-7.340	-3.979	-1.081 °	-0.101	-2.088	-4.692 *	-2.689	-2.497	-2.736 *	-1.725	-1.625	-0.453 °	-0.027
		(15.430)	(6.337)	(11.728)	(3.214)	(0.650)	(0.317)	(2.188)	(1.998)	(4.581)	(2.244)	(1.212)	(2.844)	(1.346)	(0.242)	(0.073)
Large scale production	low	-17.915	-21.129 ***	-24.580	-2.837	-1.361 °	-0.340	-1.489	-5.911 **	-9.006	-1.781	-3.447 **	-5.778	-1.158	-0.570 *	-0.091
		(12.208)	(5.603)	(16.676)	(2.440)	(0.733)	(0.940)	(1.621)	(1.951)	(8.099)	(1.684)	(1.212)	(4.563)	(1.019)	(0.263)	(0.207)
	high	-65.070 ***	-30.920 ***	7.385	-10.305 °	-1.992 °	0.102	-5.409	-8.650 ***	2.706	-6.467	-5.045 **	1.736	-4.207	-0.835 *	0.027
		(18.800)	(6.545)	(14.870)	(6.173)	(1.024)	(0.342)	(4.849)	(2.499)	(5.677)	(4.636)	(1.580)	(3.565)	(2.637)	(0.361)	(0.081)
Recreation service	low	-30.078 *	-24.482 ***	-18.081	-4.764	-1.577 °	-0.250	-2.500	-6.849 **	-6.625	-2.989	-3.995 **	-4.250	-1.945	-0.661 *	-0.067
		(15.276)	(6.937)	(17.333)	(3.479)	(0.864)	(0.712)	(2.473)	(2.362)	(7.458)	(2.480)	(1.460)	(4.422)	(1.465)	(0.312)	(0.159)
	high	-52.907 *	-27.567 ***	0.886	-8.379	-1.776 °	0.012	-4.398	-7.712 **	0.325	-5.258	-4.498 **	0.208	-3.421	-0.744 *	0.003
		(20.794)	(7.290)	(16.093)	(5.493)	(0.956)	(0.225)	(4.113)	(2.541)	(5.899)	(4.021)	(1.579)	(3.784)	(2.330)	(0.343)	(0.060)
Knowledge intensive production	low	-21.209 °	-21.408 ***	-21.495	-3.359	-1.379 °	-0.297	-1.763	-5.989 **	-7.875	-2.108	-3.493 **	-5.053	-1.371	-0.578 *	-0.079
		(12.043)	(5.807)	(16.136)	(2.597)	(0.747)	(0.828)	(1.800)	(2.006)	(7.521)	(1.829)	(1.244)	(4.308)	(1.090)	(0.268)	(0.183)
	high	-61.777 **	-30.641 ***	4.300	-9.784	-1.974 °	0.059	-5.135	-8.572 ***	1.575	-6.140	-4.999 **	1.011	-3.994	-0.827 *	0.016
		(19.995)	(6.888)	(19.506)	(6.032)	(1.026)	(0.313)	(4.664)	(2.560)	(7.207)	(4.492)	(1.611)	(4.603)	(2.571)	(0.363)	(0.080)
Health service	low	-21.925 °	-16.055 **	-9.402	-3.472	-1.034 °	-0.130	-1.822	-4.492 *	-3.445	-2.179	-2.620 *	-2.210	-1.418	-0.433 *	-0.035
		(12.719)	(5.405)	(14.555)	(2.716)	(0.597)	(0.403)	(1.874)	(1.751)	(5.708)	(1.908)	(1.069)	(3.536)	(1.139)	(0.219)	(0.093)
	high	-61.060 **	-35.994 ***	-7.792	-9.670	-2.319 °	-0.108	-5.075	-10.070 ***	-2.855	-6.069	-5.873 **	-1.832	-3.948	-0.972 *	-0.029
		(19.632)	(7.457)	(15.196)	(5.951)	(1.188)	(0.357)	(4.606)	(2.876)	(5.817)	(4.434)	(1.821)	(3.648)	(2.537)	(0.418)	(0.084)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A5: Trade service and food – Continued 4

Interaction with	Level	Trade service and food											
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.706 (0.454)	0.705 *** (0.186)	0.704 (0.467)	-0.796 ** (0.307)	-0.050 (0.084)	0.117 (0.167)	-0.260 ° (0.135)	-0.176 *** (0.047)	-0.061 (0.085)	0.349 * (0.158)	-0.004 (0.032)	-0.075 (0.104)
Professional service	low	0.643 (0.605)	0.577 * (0.260)	0.510 (0.593)	-0.946 * (0.384)	-0.041 (0.070)	-0.133 (0.216)	-0.309 ° (0.165)	-0.145 ** (0.052)	0.070 (0.111)	0.415 * (0.195)	-0.003 (0.027)	0.085 (0.136)
	high	0.768 (0.547)	0.833 ** (0.304)	0.898 (0.729)	-0.646 * (0.305)	-0.059 (0.100)	0.366 (0.329)	-0.212 ° (0.124)	-0.207 ** (0.066)	-0.192 (0.161)	0.284 ° (0.150)	-0.004 (0.038)	-0.235 (0.196)
Simple production	low	0.098 (0.496)	0.651 ** (0.246)	1.204 * (0.546)	-0.628 * (0.285)	-0.048 (0.081)	0.220 (0.229)	-0.206 ° (0.118)	-0.169 ** (0.053)	-0.116 (0.114)	0.276 ° (0.141)	-0.004 (0.031)	-0.141 (0.139)
	high	1.313 ° (0.672)	0.759 *** (0.228)	0.204 (0.616)	-0.964 * (0.406)	-0.052 (0.088)	0.013 (0.198)	-0.315 ° (0.173)	-0.183 *** (0.052)	-0.007 (0.104)	0.423 * (0.204)	-0.004 (0.033)	-0.008 (0.127)
Primary and related production	low	0.280 (0.528)	0.582 * (0.247)	0.884 (0.642)	-1.110 ** (0.401)	-0.068 (0.114)	0.134 (0.221)	-0.363 * (0.182)	-0.238 *** (0.064)	-0.070 (0.114)	0.487 * (0.210)	-0.005 (0.044)	-0.086 (0.139)
	high	1.131 ° (0.640)	0.828 ** (0.257)	0.524 (0.461)	-0.482 (0.311)	-0.032 (0.055)	0.100 (0.167)	-0.158 (0.116)	-0.113 * (0.047)	-0.052 (0.086)	0.212 (0.145)	-0.002 (0.021)	-0.064 (0.105)
Large scale production	low	0.876 ° (0.514)	0.668 ** (0.216)	0.461 (0.586)	-0.344 (0.244)	-0.040 (0.069)	0.333 (0.282)	-0.112 (0.089)	-0.143 ** (0.046)	-0.175 (0.136)	0.151 (0.113)	-0.003 (0.026)	-0.214 (0.167)
	high	0.536 (0.526)	0.741 ** (0.240)	0.947 (0.615)	-1.249 ** (0.436)	-0.059 (0.100)	-0.100 (0.208)	-0.408 * (0.201)	-0.209 *** (0.058)	0.053 (0.108)	0.548 * (0.231)	-0.005 (0.038)	0.064 (0.132)
Recreation service	low	0.909 (0.596)	0.848 ** (0.270)	0.787 (0.652)	-0.577 ° (0.314)	-0.047 (0.080)	0.245 (0.266)	-0.189 (0.122)	-0.165 ** (0.055)	-0.129 (0.133)	0.253 ° (0.150)	-0.004 (0.030)	-0.158 (0.162)
	high	0.502 (0.758)	0.562 * (0.280)	0.621 (0.657)	-1.015 * (0.446)	-0.053 (0.090)	-0.012 (0.218)	-0.332 ° (0.186)	-0.186 ** (0.059)	0.006 (0.115)	0.446 * (0.222)	-0.004 (0.034)	0.008 (0.140)
Knowledge intensive production	low	0.335 (0.507)	0.857 *** (0.231)	1.378 * (0.597)	-0.407 ° (0.244)	-0.041 (0.070)	0.292 (0.264)	-0.133 (0.092)	-0.145 ** (0.047)	-0.153 (0.129)	0.179 (0.115)	-0.003 (0.026)	-0.187 (0.158)
	high	1.076 ° (0.630)	0.553 * (0.249)	0.030 (0.788)	-1.185 ** (0.448)	-0.059 (0.100)	-0.058 (0.266)	-0.388 ° (0.199)	-0.207 *** (0.059)	0.031 (0.140)	0.520 * (0.232)	-0.004 (0.038)	0.037 (0.171)
Health service	low	0.718 (0.527)	0.819 *** (0.219)	0.919 (0.570)	-0.421 (0.258)	-0.031 (0.053)	0.128 (0.208)	-0.138 (0.097)	-0.108 ** (0.041)	-0.067 (0.107)	0.185 (0.121)	-0.002 (0.020)	-0.082 (0.131)
	high	0.693 (0.615)	0.591 * (0.263)	0.489 (0.618)	-1.172 ** (0.441)	-0.069 (0.117)	0.106 (0.213)	-0.383 ° (0.197)	-0.243 *** (0.067)	-0.056 (0.110)	0.514 * (0.228)	-0.005 (0.045)	-0.068 (0.135)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A5: Trade service and food – Continued 5

Interaction with	Level	Trade service and food											
		Population development via joblessness			Population development via joblessness and taxes			Population development via wages and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.042 (0.247)	0.318 ** (0.099)	0.578 * (0.269)	-0.006 (0.033)	0.001 (0.010)	0.166 (0.102)	0.170 ° (0.092)	-0.002 (0.018)	-0.085 (0.073)	-0.174 (0.178)	0.002 (0.014)	0.015 (0.181)
Professional service	low	0.020 (0.331)	0.124 (0.139)	0.222 (0.315)	-0.003 (0.044)	0.000 (0.004)	0.064 (0.094)	0.194 ° (0.111)	-0.002 (0.016)	-0.050 (0.060)	-0.274 (0.241)	0.002 (0.017)	-0.045 (0.230)
	high	0.064 (0.303)	0.512 ** (0.170)	0.934 * (0.433)	-0.008 (0.041)	0.002 (0.015)	0.269 (0.165)	0.147 (0.091)	-0.002 (0.020)	-0.119 (0.106)	-0.075 (0.206)	0.001 (0.011)	0.075 (0.283)
Simple production	low	0.055 (0.275)	0.225 ° (0.133)	0.384 (0.300)	-0.007 (0.037)	0.001 (0.007)	0.110 (0.097)	0.121 (0.079)	-0.001 (0.013)	-0.057 (0.060)	-0.239 (0.199)	0.004 (0.030)	0.179 (0.222)
	high	0.029 (0.370)	0.412 *** (0.123)	0.772 * (0.355)	-0.004 (0.049)	0.001 (0.012)	0.222 (0.136)	0.219 ° (0.124)	-0.003 (0.023)	-0.112 (0.097)	-0.110 (0.253)	0.000 (0.003)	-0.148 (0.245)
Primary and related production	low	0.047 (0.285)	0.360 ** (0.135)	0.654 ° (0.353)	-0.006 (0.038)	0.001 (0.011)	0.188 (0.127)	0.036 (0.064)	-0.002 (0.016)	-0.148 (0.123)	-0.226 (0.209)	0.003 (0.024)	0.111 (0.252)
	high	0.037 (0.354)	0.277 * (0.139)	0.503 ° (0.266)	-0.005 (0.047)	0.001 (0.008)	0.145 (0.096)	0.305 * (0.154)	-0.002 (0.020)	-0.021 (0.039)	-0.123 (0.241)	0.000 (0.004)	-0.080 (0.179)
Large scale production	low	-0.046 (0.284)	0.058 (0.114)	0.156 (0.307)	0.006 (0.038)	0.000 (0.002)	0.045 (0.090)	0.164 ° (0.094)	-0.002 (0.017)	-0.084 (0.078)	-0.241 (0.206)	0.001 (0.008)	-0.145 (0.233)
	high	0.130 (0.289)	0.579 *** (0.136)	1.001 ** (0.384)	-0.017 (0.040)	0.002 (0.017)	0.288 ° (0.160)	0.177 ° (0.099)	-0.002 (0.018)	-0.086 (0.080)	-0.107 (0.199)	0.002 (0.020)	0.175 (0.244)
Recreation service	low	0.245 (0.343)	0.349 * (0.147)	0.447 (0.355)	-0.033 (0.050)	0.001 (0.010)	0.129 (0.114)	0.112 (0.086)	-0.002 (0.016)	-0.100 (0.091)	-0.015 (0.223)	-0.002 (0.014)	-0.207 (0.264)
	high	-0.161 (0.419)	0.287 ° (0.151)	0.710 ° (0.375)	0.021 (0.057)	0.001 (0.009)	0.204 (0.135)	0.229 ° (0.135)	-0.002 (0.020)	-0.069 (0.073)	-0.334 (0.301)	0.005 (0.041)	0.238 (0.269)
Knowledge intensive production	low	0.493 ° (0.293)	0.249 * (0.121)	0.018 (0.307)	-0.066 (0.056)	0.001 (0.007)	0.005 (0.088)	0.218 ° (0.113)	-0.003 (0.022)	-0.094 (0.085)	0.168 (0.197)	0.003 (0.027)	0.560 ° (0.313)
	high	-0.409 (0.360)	0.388 ** (0.138)	1.139 * (0.482)	0.055 (0.058)	0.001 (0.012)	0.327 ° (0.191)	0.123 (0.091)	-0.002 (0.014)	-0.075 (0.083)	-0.516 ° (0.282)	0.000 (0.002)	-0.530 (0.363)
Health service	low	0.216 (0.292)	0.300 * (0.119)	0.378 (0.310)	-0.029 (0.043)	0.001 (0.009)	0.109 (0.099)	0.164 ° (0.095)	-0.002 (0.016)	-0.069 (0.068)	-0.152 (0.202)	0.003 (0.025)	0.190 (0.231)
	high	-0.132 (0.345)	0.337 * (0.142)	0.779 * (0.361)	0.018 (0.047)	0.001 (0.010)	0.224 (0.137)	0.177 ° (0.106)	-0.002 (0.020)	-0.101 (0.090)	-0.196 (0.238)	0.000 (0.004)	-0.160 (0.247)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A6: Recreation service

Interaction with	Level	Recreation service											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-4.626 ** (1.687)	-1.723 ** (0.647)	1.180 (1.427)	-2.468 *** (0.726)	-0.973 *** (0.277)	0.523 (0.605)	0.497 ° (0.273)	0.217 * (0.092)	-0.170 (0.219)	-190.768 *** (40.028)	-56.094 *** (15.192)	78.579 * (32.723)
Professional service	low	-4.296 ° (2.355)	-1.070 (0.878)	2.157 (2.011)	-2.309 * (1.011)	-0.779 * (0.372)	0.750 (0.856)	0.461 (0.316)	0.134 (0.114)	-0.311 (0.322)	-217.042 *** (55.375)	-74.146 *** (20.178)	68.750 (46.607)
	high	-4.957 * (2.479)	-2.376 ° (1.237)	0.204 (2.757)	-2.627 * (1.052)	-1.166 * (0.525)	0.295 (1.163)	0.532 (0.345)	0.299 ° (0.166)	-0.029 (0.398)	-164.494 ** (57.204)	-38.042 (28.504)	88.409 (62.665)
Simple production	low	-5.610 *** (1.569)	-1.729 ° (0.887)	2.152 (1.337)	-1.951 ** (0.701)	-0.651 ° (0.384)	0.648 (0.568)	0.602 * (0.300)	0.217 ° (0.119)	-0.310 (0.238)	-132.862 *** (38.571)	-49.629 * (20.778)	33.604 (30.798)
	high	-3.642 (2.674)	-1.717 * (0.829)	0.208 (2.067)	-2.985 ** (1.131)	-1.294 *** (0.353)	0.397 (0.874)	0.391 (0.329)	0.216 ° (0.113)	-0.030 (0.298)	-248.674 *** (61.636)	-62.560 ** (19.360)	123.555 ** (47.162)
Primary and related production	low	-4.758 * (2.088)	-1.293 (0.933)	2.172 (2.059)	-2.815 ** (0.896)	-0.867 * (0.397)	1.082 (0.871)	0.511 ° (0.307)	0.163 (0.122)	-0.313 (0.329)	-249.764 *** (51.141)	-66.230 ** (21.887)	117.303 * (47.496)
	high	-4.494 ° (2.655)	-2.153 * (1.017)	0.189 (1.394)	-2.121 ° (1.127)	-1.079 * (0.432)	-0.037 (0.591)	0.482 (0.347)	0.271 ° (0.138)	-0.027 (0.201)	-131.772 * (61.139)	-45.958 ° (23.513)	39.856 (31.821)
Large scale production	low	0.006 (2.075)	-0.794 (0.862)	-1.594 (1.948)	-2.036 * (0.877)	-1.194 ** (0.364)	-0.352 (0.825)	-0.001 (0.223)	0.100 (0.110)	0.230 (0.299)	-33.491 (47.648)	5.102 (19.918)	43.694 (44.627)
	high	-9.259 *** (2.430)	-2.652 ** (0.908)	3.955 * (1.979)	-2.900 ** (1.056)	-0.752 ° (0.392)	1.397 ° (0.840)	0.994 * (0.485)	0.333 * (0.132)	-0.570 (0.384)	-348.045 *** (58.860)	-117.290 *** (21.265)	113.464 * (46.447)
Trade services and food	low	-3.224 (2.198)	-1.544 (1.011)	0.136 (1.997)	-2.894 ** (0.939)	-1.040 * (0.431)	0.815 (0.843)	0.346 (0.276)	0.194 (0.133)	-0.020 (0.288)	-158.590 ** (51.225)	-46.311 * (23.417)	65.968 (45.452)
	high	-6.028 ** (2.229)	-1.902 ** (0.673)	2.224 (1.847)	-2.042 * (0.953)	-0.906 ** (0.287)	0.231 (0.785)	0.647 ° (0.358)	0.239 * (0.097)	-0.321 (0.303)	-222.946 *** (52.479)	-65.878 *** (15.752)	91.191 * (42.692)
Knowledge intensive production	low	-3.374 (2.095)	-1.558 (0.971)	0.257 (1.827)	-2.138 * (0.887)	-0.895 * (0.412)	0.347 (0.774)	0.362 (0.270)	0.196 (0.128)	-0.037 (0.264)	-166.911 *** (48.647)	-41.573 ° (22.383)	83.764 * (41.879)
	high	-5.879 * (2.542)	-1.888 ** (0.726)	2.104 (2.374)	-2.798 * (1.102)	-1.050 *** (0.310)	0.698 (1.017)	0.631 ° (0.377)	0.237 * (0.102)	-0.303 (0.368)	-214.625 *** (59.961)	-70.615 *** (16.953)	73.395 (54.866)
Health service	low	-5.147 * (2.240)	-1.952 * (0.864)	1.242 (1.747)	-1.933 * (0.963)	-0.821 * (0.369)	0.291 (0.742)	0.552 ° (0.331)	0.245 * (0.119)	-0.179 (0.264)	-175.737 *** (52.339)	-46.915 * (20.031)	81.908 * (40.024)
	high	-4.106 * (1.887)	-1.494 * (0.710)	1.119 (1.371)	-3.003 *** (0.803)	-1.124 *** (0.302)	0.754 (0.579)	0.441 (0.272)	0.188 ° (0.097)	-0.161 (0.211)	-205.799 *** (44.472)	-65.274 *** (16.585)	75.251 * (31.559)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A6: Recreation service – Continued 1

Interaction with	Level	Recreation service											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		42.048 (38.256)	22.723 (14.259)	3.397 (31.138)	-26.503 ° (15.194)	-6.514 ° (3.564)	2.163 (5.432)	-10.820 ° (6.517)	-2.729 * (1.286)	0.578 (1.135)	53.783 ** (20.606)	12.252 ** (4.303)	-1.776 (3.336)
Professional service	low	98.066 ° (52.245)	40.517 * (18.991)	-17.032 (43.003)	-24.610 (17.339)	-4.044 (3.689)	3.952 (9.450)	-10.047 (7.318)	-1.694 (1.472)	1.057 (1.908)	50.314 * (25.261)	9.816 ° (5.106)	-2.550 (4.764)
	high	-13.969 (53.389)	4.929 (26.571)	23.826 (59.147)	-28.397 (18.960)	-8.985 (5.886)	0.373 (5.119)	-11.593 (8.031)	-3.764 ° (2.233)	0.100 (1.360)	57.253 * (26.898)	14.688 * (7.271)	-1.003 (4.223)
Simple production	low	44.751 (36.314)	12.946 (19.431)	-18.859 (30.013)	-32.142 ° (16.823)	-6.538 (4.244)	3.943 (9.021)	-13.122 ° (7.283)	-2.739 ° (1.607)	1.054 (1.757)	42.509 * (18.495)	8.201 (5.117)	-2.204 (3.789)
	high	39.345 (58.176)	32.499 ° (18.060)	25.654 (43.980)	-20.865 (17.883)	-6.491 (4.062)	0.382 (3.881)	-8.518 (7.469)	-2.719 ° (1.524)	0.102 (1.025)	65.058 * (29.370)	16.303 ** (5.568)	-1.348 (3.578)
Primary and related production	low	53.832 (49.869)	45.868 * (20.383)	37.903 (45.185)	-27.260 (16.986)	-4.890 (4.027)	3.979 (9.539)	-11.129 (7.233)	-2.048 (1.588)	1.064 (1.930)	61.353 * (24.671)	10.919 * (5.479)	-3.676 (6.193)
	high	30.264 (56.582)	-0.422 (21.897)	-31.109 (29.593)	-25.746 (19.001)	-8.138 (5.026)	0.346 (2.666)	-10.511 (7.996)	-3.409 ° (1.880)	0.092 (0.698)	46.214 ° (27.047)	13.585 * (6.114)	0.124 (2.016)
Large scale production	low	21.950 (43.846)	25.268 (18.431)	28.587 (41.392)	0.036 (11.889)	-3.002 (3.472)	-2.922 (7.357)	0.015 (4.854)	-1.258 (1.412)	-0.781 (1.540)	44.363 * (22.001)	15.038 ** (5.536)	1.197 (3.317)
	high	62.147 (57.374)	20.177 (20.341)	-21.793 (44.008)	-53.042 ° (27.286)	-10.026 ° (5.264)	7.247 (16.363)	-21.655 ° (11.836)	-4.200 * (1.871)	1.938 (3.150)	63.204 * (27.757)	9.466 ° (5.307)	-4.749 (7.584)
Trade services and food	low	63.807 (47.928)	19.554 (21.784)	-24.698 (42.986)	-18.470 (15.013)	-5.837 (4.473)	0.250 (3.701)	-7.541 (6.285)	-2.445 (1.746)	0.067 (0.984)	63.064 * (25.663)	13.095 * (6.065)	-2.769 (4.999)
	high	20.290 (49.724)	25.891 ° (14.829)	31.493 (39.763)	-34.536 ° (19.914)	-7.191 ° (3.828)	4.076 (9.591)	-14.100 ° (8.537)	-3.012 * (1.368)	1.090 (1.913)	44.503 ° (23.461)	11.409 ** (4.310)	-0.784 (2.909)
Knowledge intensive production	low	-99.093 * (45.743)	-11.235 (20.693)	76.623 ° (39.340)	-19.328 (14.737)	-5.892 (4.355)	0.471 (3.504)	-7.891 (6.191)	-2.468 (1.691)	0.126 (0.916)	46.585 * (22.465)	11.275 * (5.684)	-1.180 (3.159)
	high	183.190 ** (56.287)	56.681 *** (15.991)	-69.829 (51.074)	-33.678 (20.833)	-7.136 ° (3.948)	3.855 (9.537)	-13.750 (8.876)	-2.989 * (1.430)	1.031 (1.973)	60.982 * (28.302)	13.229 ** (4.758)	-2.372 (4.927)
Health service	low	-19.075 (49.000)	-0.827 (18.602)	17.420 (37.577)	-29.485 (18.301)	-7.381 ° (4.394)	2.275 (5.946)	-12.037 (7.795)	-3.092 ° (1.628)	0.608 (1.272)	42.130 ° (23.403)	10.340 * (5.107)	-0.990 (2.918)
	high	103.172 * (42.531)	46.273 ** (15.579)	-10.626 (30.224)	-23.522 (15.007)	-5.647 (3.500)	2.050 (5.165)	-9.603 (6.378)	-2.366 ° (1.311)	0.548 (1.082)	65.436 ** (23.762)	14.164 ** (4.792)	-2.562 (4.271)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A6: Recreation service – Continued 2

Interaction with	Level	Recreation service														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-36.041 (27.676)	-11.024 (10.358)	13.992 (22.521)	18.054 (11.452)	10.549 ** (3.541)	-7.512 (8.915)	11.745 ° (6.230)	1.745 * (0.784)	-0.118 (0.289)	-40.073 ** (15.334)	-9.663 ** (3.331)	10.567 (8.240)	9.182 (9.008)	3.236 (2.224)	0.226 (2.101)
Professional service	low	-109.917 ** (37.922)	-48.402 *** (13.846)	13.113 (31.217)	16.889 (12.033)	8.452 * (4.309)	-10.783 (12.633)	10.987 (6.832)	1.398 ° (0.826)	-0.170 (0.414)	-45.593 * (18.659)	-12.773 ** (4.416)	9.245 (8.743)	21.415 (13.853)	5.771 ° (3.151)	-1.133 (3.367)
	high	37.835 (38.585)	26.354 (19.194)	14.872 (42.733)	19.218 (13.264)	12.646 * (6.122)	-4.240 (16.761)	12.502 ° (7.453)	2.092 ° (1.190)	-0.067 (0.300)	-34.554 * (16.330)	-6.553 (5.105)	11.888 (11.509)	-3.050 (11.712)	0.702 (3.790)	1.584 (4.653)
Simple production	low	-7.480 (26.290)	-9.288 (14.048)	-11.096 (21.742)	14.269 (9.517)	7.061 (4.345)	-9.322 (8.526)	9.283 ° (5.283)	1.168 (0.799)	-0.147 (0.341)	-27.909 * (12.059)	-8.549 * (4.017)	4.519 (5.102)	9.772 (8.703)	1.844 (2.815)	-1.254 (2.803)
	high	-64.602 (42.059)	-12.761 (13.140)	39.081 (31.790)	21.838 (14.801)	14.037 ** (4.570)	-5.702 (12.655)	14.207 ° (8.265)	2.322 * (1.026)	-0.090 (0.276)	-52.238 * (21.144)	-10.777 ** (4.050)	16.614 (12.658)	8.592 (13.089)	4.629 (2.880)	1.706 (3.964)
Primary and related production	low	-41.015 (36.104)	-15.794 (14.859)	9.428 (32.859)	20.595 (13.304)	9.401 * (4.616)	-15.548 (13.181)	13.398 ° (7.293)	1.555 ° (0.894)	-0.244 (0.563)	-52.466 ** (19.932)	-11.409 * (4.487)	15.774 (12.205)	11.755 (11.713)	6.533 ° (3.431)	2.520 (4.966)
	high	-31.067 (40.928)	-6.255 (15.820)	18.557 (21.438)	15.513 (11.997)	11.697 * (5.123)	0.525 (8.491)	10.092 (6.971)	1.935 ° (1.026)	0.008 (0.135)	-27.681 ° (15.601)	-7.917 ° (4.388)	5.359 (5.549)	6.609 (12.592)	-0.060 (3.119)	-2.069 (3.796)
Large scale production	low	-87.447 ** (31.860)	-21.257 (13.406)	44.932 (29.925)	14.892 (10.546)	12.948 ** (4.575)	5.062 (11.937)	9.688 (5.976)	2.142 * (0.991)	0.080 (0.253)	-7.035 (10.259)	0.879 (3.436)	5.876 (7.143)	4.793 (9.735)	3.599 (2.812)	1.901 (4.058)
	high	15.366 (41.606)	-0.791 (14.712)	-16.947 (31.959)	21.216 (14.207)	8.150 ° (4.491)	-20.085 (13.192)	13.802 ° (7.898)	1.348 (0.845)	-0.316 (0.707)	-73.112 ** (26.462)	-20.205 *** (5.656)	15.257 (11.841)	13.571 (13.482)	2.874 (3.007)	-1.449 (3.706)
Trade services and food	low	-54.410 (34.703)	-32.595 * (15.766)	-10.780 (31.072)	21.169 (13.738)	11.275 * (5.091)	-11.709 (12.506)	13.771 ° (7.545)	1.865 ° (1.009)	-0.184 (0.440)	-33.314 * (15.147)	-7.978 ° (4.378)	8.871 (8.460)	13.934 (11.648)	2.785 (3.199)	-1.642 (3.848)
	high	-17.672 (35.920)	10.546 (10.778)	38.764 (28.782)	14.938 (10.911)	9.823 ** (3.569)	-3.314 (11.316)	9.718 (6.242)	1.625 * (0.764)	-0.052 (0.210)	-46.833 * (18.604)	-11.349 ** (3.636)	12.262 (9.916)	4.431 (10.979)	3.688 (2.351)	2.094 (4.217)
Knowledge intensive production	low	-23.092 (33.388)	-20.632 (15.035)	-18.171 (28.558)	15.637 (10.925)	9.708 * (4.791)	-4.992 (11.209)	10.173 ° (6.164)	1.606 ° (0.926)	-0.078 (0.243)	-35.062 * (15.176)	-7.162 ° (4.147)	11.264 (9.320)	-21.639 ° (12.760)	-1.600 (2.981)	5.095 (8.411)
	high	-48.989 (41.313)	-1.417 (11.745)	46.156 (37.052)	20.470 (14.048)	11.390 ** (3.925)	-10.031 (14.863)	13.317 ° (7.878)	1.884 * (0.859)	-0.158 (0.411)	-45.085 * (19.152)	-12.165 ** (3.906)	9.869 (9.838)	40.004 * (19.144)	8.073 * (3.209)	-4.643 (8.038)
Health service	low	-17.302 (35.501)	2.768 (13.495)	22.838 (27.148)	14.142 (10.622)	8.903 * (4.300)	-4.189 (10.730)	9.200 (6.125)	1.473 ° (0.836)	-0.066 (0.220)	-36.916 * (16.138)	-8.082 * (3.857)	11.014 (9.039)	-4.165 (10.809)	-0.118 (2.650)	1.158 (3.090)
	high	-54.780 ° (31.043)	-24.817 * (11.387)	5.147 (21.984)	21.965 (13.672)	12.195 ** (3.930)	-10.835 (8.806)	14.289 ° (7.376)	2.017 * (0.886)	-0.170 (0.390)	-43.231 ** (16.692)	-11.245 ** (3.730)	10.119 (7.907)	22.530 ° (12.433)	6.591 * (2.886)	-0.707 (2.295)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A6: Recreation service – Continued 3

Interaction with	Level	Recreation service														
		Tax via GDP			Tax via GDP and household income			Tax via GDP and wages			Tax via GDP and joblessness			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-36.544 * (15.843)	-14.400 * (5.727)	10.403 (13.041)	-5.788 (3.939)	-0.928 (0.570)	0.144 (0.426)	-3.038 (2.895)	-4.028 * (1.787)	3.812 (5.281)	-3.632 (2.856)	-2.350 * (1.080)	2.445 (3.221)	-2.363 (1.666)	-0.389 ° (0.213)	0.038 (0.097)
Professional service	low	-33.933 ° (20.237)	-8.938 (7.431)	19.011 (18.813)	-5.374 (4.269)	-0.576 (0.550)	0.263 (0.752)	-2.821 (2.926)	-2.501 (2.136)	6.965 (8.026)	-3.373 (2.990)	-1.458 (1.258)	4.469 (4.777)	-2.194 (1.789)	-0.241 (0.220)	0.070 (0.168)
	high	-39.155 ° (21.628)	-19.861 ° (10.660)	1.796 (24.314)	-6.201 (4.724)	-1.280 (0.912)	0.025 (0.343)	-3.255 (3.296)	-5.556 ° (3.176)	0.658 (8.917)	-3.892 (3.337)	-3.241 ° (1.893)	0.422 (5.718)	-2.532 (1.985)	-0.536 (0.352)	0.007 (0.091)
Simple production	low	-44.319 ** (16.176)	-14.452 ° (7.650)	18.969 (13.357)	-7.019 (4.486)	-0.931 (0.658)	0.262 (0.727)	-3.684 (3.404)	-4.043 ° (2.283)	6.950 (6.386)	-4.405 (3.307)	-2.358 ° (1.362)	4.459 (3.620)	-2.866 (1.907)	-0.390 (0.254)	0.070 (0.160)
	high	-28.769 (22.171)	-14.348 * (7.180)	1.837 (18.235)	-4.556 (4.248)	-0.924 (0.634)	0.025 (0.261)	-2.391 (2.742)	-4.014 ° (2.158)	0.673 (6.693)	-2.859 (2.894)	-2.341 ° (1.290)	0.432 (4.290)	-1.860 (1.768)	-0.387 (0.243)	0.007 (0.069)
Primary and related production	low	-37.588 * (18.701)	-10.809 (7.922)	19.142 (19.225)	-5.953 (4.304)	-0.696 (0.606)	0.265 (0.758)	-3.124 (3.074)	-3.024 (2.294)	7.014 (8.170)	-3.736 (3.076)	-1.764 (1.355)	4.500 (4.871)	-2.430 (1.814)	-0.292 (0.240)	0.071 (0.170)
	high	-35.500 (22.562)	-17.990 * (8.817)	1.664 (12.303)	-5.622 (4.634)	-1.159 (0.786)	0.023 (0.181)	-2.951 (3.129)	-5.033 ° (2.658)	0.610 (4.522)	-3.528 (3.223)	-2.935 ° (1.590)	0.391 (2.896)	-2.295 (1.939)	-0.486 (0.300)	0.006 (0.047)
Large scale production	low	0.049 (16.394)	-6.637 (7.260)	-14.055 (17.793)	0.008 (2.596)	-0.428 (0.509)	-0.194 (0.576)	0.004 (1.363)	-1.857 (2.064)	-5.150 (7.193)	0.005 (1.629)	-1.083 (1.211)	-3.304 (4.390)	0.003 (1.060)	-0.179 (0.207)	-0.052 (0.131)
	high	-73.137 ** (25.745)	-22.163 ** (8.129)	34.862 ° (20.917)	-11.583 (7.319)	-1.428 ° (0.850)	0.482 (1.325)	-6.079 (5.586)	-6.200 * (2.580)	12.773 (10.751)	-7.269 (5.412)	-3.616 * (1.567)	8.195 (5.928)	-4.729 (3.113)	-0.598 ° (0.315)	0.129 (0.291)
Trade services and food	low	-25.468 (18.365)	-12.903 (8.619)	1.200 (17.609)	-4.033 (3.597)	-0.831 (0.678)	0.017 (0.247)	-2.117 (2.358)	-3.610 (2.513)	0.440 (6.457)	-2.531 (2.468)	-2.105 (1.488)	0.282 (4.141)	-1.647 (1.500)	-0.348 (0.267)	0.004 (0.066)
	high	-47.621 * (20.854)	-15.897 ** (5.995)	19.606 (17.531)	-7.542 (5.154)	-1.024 ° (0.616)	0.271 (0.767)	-3.958 (3.780)	-4.447 * (1.891)	7.183 (7.697)	-4.733 (3.733)	-2.594 * (1.147)	4.609 (4.522)	-3.079 (2.180)	-0.429 ° (0.229)	0.072 (0.171)
Knowledge intensive production	low	-26.650 (17.691)	-13.025 (8.291)	2.264 (16.123)	-4.221 (3.571)	-0.839 (0.663)	0.031 (0.238)	-2.215 (2.387)	-3.644 (2.427)	0.829 (5.927)	-2.649 (2.472)	-2.125 (1.439)	0.532 (3.796)	-1.723 (1.492)	-0.352 (0.260)	0.008 (0.062)
	high	-46.438 * (22.841)	-15.775 * (6.406)	18.543 (21.808)	-7.354 (5.289)	-1.016 (0.630)	0.256 (0.751)	-3.860 (3.787)	-4.413 * (1.991)	6.794 (8.940)	-4.615 (3.784)	-2.574 * (1.202)	4.359 (5.420)	-3.003 (2.230)	-0.426 ° (0.236)	0.069 (0.170)
Health service	low	-40.655 * (20.104)	-16.317 * (7.534)	10.947 (15.825)	-6.439 (4.642)	-1.051 (0.692)	0.151 (0.461)	-3.379 (3.319)	-4.565 * (2.291)	4.011 (6.263)	-4.041 (3.320)	-2.662 ° (1.374)	2.573 (3.862)	-2.629 (1.956)	-0.440 ° (0.263)	0.040 (0.106)
	high	-32.433 ° (16.738)	-12.483 * (6.155)	9.860 (12.521)	-5.136 (3.780)	-0.804 (0.547)	0.136 (0.405)	-2.696 (2.678)	-3.492 ° (1.854)	3.613 (5.059)	-3.223 (2.691)	-2.037 ° (1.109)	2.318 (3.089)	-2.097 (1.591)	-0.337 (0.209)	0.036 (0.092)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A6: Recreation service – Continued 4

Interaction with	Level	Recreation service														
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-0.776 (0.624)	0.470 * (0.233)	1.715 *** (0.508)	-0.701 * (0.334)	-0.028 (0.048)	-0.141 (0.191)	-0.229 ° (0.135)	-0.097 * (0.042)	0.074 (0.097)	0.308 ° (0.163)	-0.002 (0.018)	0.091 (0.119)	0.304 (0.251)	-0.002 (0.014)	0.122 (0.202)
Professional service	low	-0.661 (0.868)	0.911 ** (0.317)	2.483 *** (0.714)	-0.651 (0.409)	-0.017 (0.032)	-0.258 (0.286)	-0.213 (0.153)	-0.060 (0.051)	0.136 (0.144)	0.286 (0.192)	-0.001 (0.011)	0.166 (0.176)	0.926 * (0.427)	-0.007 (0.060)	0.114 (0.275)
	high	-0.891 (0.878)	0.029 (0.434)	0.948 (0.978)	-0.751 ° (0.440)	-0.038 (0.067)	-0.024 (0.330)	-0.246 (0.168)	-0.134 ° (0.076)	0.013 (0.173)	0.330 (0.208)	-0.003 (0.025)	0.016 (0.212)	-0.319 (0.339)	0.004 (0.033)	0.130 (0.376)
Simple production	low	0.136 (0.592)	0.781 * (0.316)	1.426 ** (0.490)	-0.850 * (0.352)	-0.028 (0.049)	-0.257 (0.223)	-0.278 ° (0.151)	-0.098 ° (0.055)	0.135 (0.108)	0.373 * (0.178)	-0.002 (0.018)	0.165 (0.132)	0.063 (0.222)	-0.001 (0.012)	-0.097 (0.193)
	high	-1.688 ° (0.949)	0.159 (0.296)	2.005 ** (0.717)	-0.552 (0.439)	-0.027 (0.048)	-0.025 (0.248)	-0.181 (0.157)	-0.097 ° (0.052)	0.013 (0.130)	0.242 (0.201)	-0.002 (0.018)	0.016 (0.159)	0.544 (0.392)	-0.002 (0.016)	0.341 (0.306)
Primary and related production	low	-0.797 (0.815)	0.782 * (0.335)	2.360 ** (0.739)	-0.721 ° (0.386)	-0.021 (0.038)	-0.260 (0.292)	-0.236 (0.151)	-0.073 (0.055)	0.136 (0.147)	0.317 ° (0.185)	-0.002 (0.013)	0.167 (0.179)	0.345 (0.322)	-0.002 (0.020)	0.082 (0.288)
	high	-0.754 (0.925)	0.158 (0.356)	1.070 * (0.486)	-0.681 (0.453)	-0.034 (0.060)	-0.023 (0.167)	-0.223 (0.167)	-0.122 ° (0.063)	0.012 (0.088)	0.299 (0.211)	-0.003 (0.022)	0.015 (0.107)	0.262 (0.354)	-0.001 (0.008)	0.162 (0.197)
Large scale production	low	0.259 (0.726)	0.397 (0.304)	0.534 (0.686)	0.001 (0.315)	-0.013 (0.025)	0.191 (0.260)	0.000 (0.103)	-0.045 (0.050)	-0.100 (0.132)	0.000 (0.138)	-0.001 (0.008)	-0.122 (0.162)	0.736 * (0.351)	-0.003 (0.026)	0.392 (0.300)
	high	-1.811 ° (0.937)	0.543 (0.332)	2.896 *** (0.722)	-1.403 * (0.565)	-0.042 (0.073)	-0.473 (0.370)	-0.459 ° (0.245)	-0.150 * (0.061)	0.249 (0.177)	0.616 * (0.288)	-0.003 (0.027)	0.304 (0.216)	-0.129 (0.353)	0.000 (0.002)	-0.148 (0.284)
Trade services and food	low	-0.579 (0.783)	0.609 ° (0.357)	1.796 * (0.700)	-0.489 (0.365)	-0.025 (0.045)	-0.016 (0.239)	-0.160 (0.132)	-0.087 (0.060)	0.009 (0.126)	0.214 (0.168)	-0.002 (0.016)	0.010 (0.154)	0.458 (0.324)	-0.005 (0.040)	-0.094 (0.273)
	high	-0.973 (0.809)	0.331 (0.243)	1.634 * (0.650)	-0.914 * (0.438)	-0.030 (0.052)	-0.266 (0.273)	-0.299 ° (0.177)	-0.107 * (0.045)	0.140 (0.136)	0.401 ° (0.214)	-0.002 (0.020)	0.171 (0.166)	0.149 (0.306)	0.002 (0.013)	0.338 (0.282)
Knowledge intensive production	low	0.121 (0.752)	0.498 (0.339)	0.874 (0.643)	-0.511 (0.354)	-0.025 (0.045)	-0.031 (0.219)	-0.167 (0.130)	-0.088 (0.058)	0.016 (0.115)	0.224 (0.164)	-0.002 (0.016)	0.020 (0.141)	0.194 (0.287)	-0.003 (0.026)	-0.158 (0.256)
	high	-1.673 ° (0.931)	0.442 ° (0.265)	2.556 ** (0.836)	-0.891 ° (0.472)	-0.030 (0.052)	-0.252 (0.322)	-0.292 (0.185)	-0.107 * (0.047)	0.132 (0.163)	0.391 ° (0.227)	-0.002 (0.020)	0.162 (0.200)	0.413 (0.370)	0.000 (0.002)	0.402 (0.357)
Health service	low	-0.705 (0.800)	0.444 (0.304)	1.594 ** (0.614)	-0.780 ° (0.415)	-0.031 (0.054)	-0.148 (0.227)	-0.255 (0.162)	-0.110 * (0.055)	0.078 (0.117)	0.342 ° (0.199)	-0.002 (0.020)	0.095 (0.143)	0.146 (0.302)	0.000 (0.004)	0.199 (0.248)
	high	-0.846 (0.702)	0.495 ° (0.258)	1.837 *** (0.495)	-0.622 ° (0.344)	-0.024 (0.042)	-0.134 (0.183)	-0.204 (0.133)	-0.084 ° (0.044)	0.070 (0.093)	0.273 ° (0.164)	-0.002 (0.015)	0.086 (0.114)	0.461 (0.297)	-0.004 (0.031)	0.045 (0.192)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A6: Recreation service – Continued 5

Interaction with	Level	Recreation service					
		Population development via joblessness			Population development via wages and taxes		
		Central	Medium	Remote	Central	Medium	Remote
None		1.140 ** (0.414)	0.437 *** (0.132)	-0.228 (0.269)	0.337 * (0.165)	-0.001 (0.012)	0.092 (0.080)
Professional service	low	1.067 * (0.519)	0.350 * (0.171)	-0.327 (0.381)	0.384 ° (0.196)	-0.002 (0.016)	0.081 (0.082)
	high	1.214 * (0.550)	0.524 * (0.242)	-0.129 (0.508)	0.291 ° (0.164)	-0.001 (0.008)	0.104 (0.108)
Simple production	low	0.901 * (0.376)	0.292 ° (0.175)	-0.283 (0.256)	0.235 ° (0.125)	-0.001 (0.011)	0.039 (0.047)
	high	1.379 * (0.599)	0.581 *** (0.169)	-0.173 (0.383)	0.440 * (0.223)	-0.002 (0.013)	0.145 (0.123)
Primary and related production	low	1.301 ** (0.498)	0.389 * (0.183)	-0.471 (0.395)	0.442 * (0.216)	-0.002 (0.014)	0.137 (0.118)
	high	0.980 ° (0.561)	0.484 * (0.200)	0.016 (0.257)	0.233 (0.150)	-0.001 (0.010)	0.047 (0.052)
Large scale production	low	0.941 * (0.452)	0.536 ** (0.173)	0.153 (0.361)	0.059 (0.088)	0.000 (0.001)	0.051 (0.065)
	high	1.340 * (0.565)	0.337 ° (0.179)	-0.609 (0.392)	0.616 * (0.292)	-0.003 (0.025)	0.133 (0.115)
Trade services and food	low	1.337 * (0.519)	0.467 * (0.199)	-0.355 (0.376)	0.281 ° (0.154)	-0.001 (0.010)	0.077 (0.079)
	high	0.944 ° (0.484)	0.407 ** (0.135)	-0.100 (0.343)	0.394 * (0.198)	-0.002 (0.014)	0.107 (0.095)
Knowledge intensive production	low	0.988 * (0.461)	0.402 * (0.189)	-0.151 (0.339)	0.295 ° (0.157)	-0.001 (0.009)	0.098 (0.089)
	high	1.293 * (0.579)	0.472 ** (0.147)	-0.304 (0.449)	0.380 ° (0.199)	-0.002 (0.015)	0.086 (0.092)
Health service	low	0.893 ° (0.484)	0.369 * (0.170)	-0.127 (0.325)	0.311 ° (0.166)	-0.001 (0.010)	0.096 (0.087)
	high	1.387 ** (0.474)	0.505 *** (0.145)	-0.329 (0.263)	0.364 * (0.180)	-0.002 (0.014)	0.088 (0.077)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A7: Knowledge intensive production

Interaction with	Level	Knowledge intensive production											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-2.168 (1.686)	1.608 ** (0.491)	5.383 ** (1.688)	-0.729 (0.713)	-0.541 * (0.210)	-0.352 (0.722)	0.233 (0.205)	-0.202 ** (0.073)	-0.776 ° (0.426)	28.834 (38.507)	67.961 *** (11.436)	107.088 ** (38.897)
Professional service	low	0.085 (1.837)	-0.451 (0.748)	-0.986 (2.168)	-0.630 (0.775)	-0.738 * (0.317)	-0.847 (0.917)	-0.009 (0.197)	0.057 (0.095)	0.142 (0.319)	-15.834 (41.794)	61.683 *** (17.177)	139.200 ** (49.470)
	high	-4.420 * (1.811)	3.666 *** (0.986)	11.752 *** (2.665)	-0.829 (0.771)	-0.343 (0.424)	0.142 (1.156)	0.474 ° (0.276)	-0.461 ** (0.154)	-1.694 * (0.855)	73.502 ° (41.791)	74.239 ** (22.883)	74.976 (62.284)
Simple production	low	-1.610 (1.673)	2.578 *** (0.761)	6.766 ** (2.074)	-1.279 ° (0.707)	-0.606 ° (0.326)	0.068 (0.888)	0.173 (0.193)	-0.324 ** (0.115)	-0.975 ° (0.532)	38.986 (38.330)	67.453 *** (17.647)	95.920 * (47.872)
	high	-2.726 (2.249)	0.637 (0.647)	4.000 * (2.000)	-0.179 (0.951)	-0.476 ° (0.274)	-0.772 (0.848)	0.293 (0.270)	-0.080 (0.083)	-0.577 (0.388)	18.682 (51.225)	68.469 *** (14.832)	118.256 ** (45.753)
Primary and related production	low	-1.803 (1.506)	2.160 ** (0.742)	6.124 * (2.493)	0.024 (0.637)	-0.853 ** (0.317)	-1.730 (1.061)	0.194 (0.180)	-0.272 * (0.107)	-0.883 (0.536)	16.315 (34.308)	81.484 *** (17.225)	146.654 * (57.341)
	high	-2.532 (2.412)	1.055 (0.999)	4.642 * (2.028)	-1.482 (1.019)	-0.228 (0.422)	1.026 (0.862)	0.272 (0.282)	-0.133 (0.128)	-0.669 (0.420)	41.353 (55.164)	54.438 * (22.821)	67.522 (46.506)
Large scale production	low	0.187 (1.653)	1.330 * (0.641)	2.473 (1.995)	-0.863 (0.698)	-0.504 ° (0.273)	-0.146 (0.844)	-0.020 (0.178)	-0.167 ° (0.087)	-0.356 (0.329)	-23.730 (37.680)	50.012 *** (14.795)	123.755 ** (45.472)
	high	-4.522 * (1.916)	1.885 ** (0.609)	8.293 *** (1.992)	-0.595 (0.815)	-0.577 * (0.261)	-0.559 (0.861)	0.485 ° (0.287)	-0.237 ** (0.090)	-1.195 ° (0.610)	81.398 ° (43.956)	85.910 *** (14.166)	90.421 ° (46.429)
Trade services and food	low	0.389 (1.766)	2.158 ** (0.672)	3.926 ° (2.060)	-1.701 * (0.745)	-0.386 (0.288)	0.929 (0.875)	-0.042 (0.190)	-0.271 ** (0.100)	-0.566 (0.391)	1.960 (40.540)	50.516 ** (15.578)	99.071 * (47.181)
	high	-4.724 * (2.118)	1.058 ° (0.639)	6.839 ** (2.405)	0.243 (0.900)	-0.695 * (0.271)	-1.633 (1.027)	0.507 (0.309)	-0.133 (0.084)	-0.986 ° (0.564)	55.708 (48.457)	85.407 *** (14.741)	115.106 * (55.479)
Recreation service	low	-0.883 (1.982)	1.776 * (0.845)	4.436 ° (2.284)	-0.390 (0.844)	-0.461 (0.359)	-0.532 (0.976)	0.095 (0.216)	-0.223 ° (0.115)	-0.639 (0.438)	53.311 (45.633)	82.859 *** (19.394)	112.408 * (52.626)
	high	-3.453 (2.681)	1.439 * (0.658)	6.330 ** (2.375)	-1.068 (1.141)	-0.620 * (0.279)	-0.172 (1.020)	0.371 (0.326)	-0.181 * (0.090)	-0.913 ° (0.535)	4.357 (61.529)	53.063 *** (15.149)	101.769 ° (54.928)
Health service	low	0.729 (1.771)	2.584 *** (0.565)	4.439 * (1.981)	-0.373 (0.748)	-0.230 (0.247)	-0.087 (0.842)	-0.078 (0.193)	-0.325 *** (0.096)	-0.640 (0.406)	4.996 (40.299)	58.686 *** (13.292)	112.375 * (45.388)
	high	-5.064 ** (1.815)	0.631 (0.700)	6.327 ** (2.126)	-1.085 (0.774)	-0.852 ** (0.298)	-0.618 (0.909)	0.544 ° (0.297)	-0.079 (0.089)	-0.912 ° (0.513)	52.672 (41.884)	77.237 *** (16.234)	101.801 * (48.959)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A7: Knowledge intensive production – Continued 1

Interaction with	Level	Knowledge intensive production											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		8.550 (35.549)	27.971 * (11.112)	47.393 (36.616)	-12.418 (11.114)	6.078 * (3.049)	9.864 (21.938)	-5.070 (4.633)	2.546 * (1.063)	2.637 (4.162)	15.888 (16.023)	6.810 * (2.996)	1.197 (3.026)
Professional service	low	9.164 (38.443)	-3.479 (16.115)	-16.122 (46.090)	0.487 (10.528)	-1.703 (2.907)	-1.807 (5.623)	0.199 (4.298)	-0.714 (1.201)	-0.483 (1.299)	13.718 (17.229)	9.297 * (4.423)	2.878 (5.278)
	high	7.935 (38.902)	59.422 ** (21.413)	110.908 ° (58.015)	-25.324 ° (15.270)	13.859 * (6.656)	21.534 (47.666)	-10.339 (6.520)	5.806 * (2.274)	5.758 (9.000)	18.057 (17.376)	4.322 (5.416)	-0.484 (3.993)
Simple production	low	-4.168 (35.528)	46.302 ** (16.721)	96.772 * (45.149)	-9.221 (10.416)	9.747 * (4.829)	12.398 (27.561)	-3.765 (4.309)	4.083 * (1.675)	3.315 (5.227)	27.883 ° (16.854)	7.630 ° (4.398)	-0.231 (3.037)
	high	21.268 (47.137)	9.641 (14.039)	-1.986 (42.548)	-15.616 (14.620)	2.409 (2.628)	7.330 (16.550)	-6.375 (6.084)	1.009 (1.064)	1.960 (3.186)	3.892 (20.745)	5.989 (3.662)	2.625 (4.838)
Primary and related production	low	44.220 (31.747)	23.217 (16.380)	2.214 (53.587)	-10.331 (9.765)	8.167 ° (4.292)	11.221 (25.126)	-4.218 (4.062)	3.421 * (1.526)	3.000 (4.798)	-0.523 (13.883)	10.745 * (4.560)	5.881 (9.418)
	high	-27.121 (50.809)	32.725 (21.199)	92.572 * (43.215)	-14.506 (15.234)	3.989 (4.099)	8.506 (19.095)	-5.922 (6.315)	1.671 (1.653)	2.274 (3.655)	32.298 (23.582)	2.874 (5.353)	-3.486 (5.932)
Large scale production	low	-45.452 (34.733)	-3.124 (13.994)	39.205 (42.755)	1.070 (9.484)	5.028 (3.143)	4.532 (10.626)	0.437 (3.873)	2.106 ° (1.180)	1.212 (2.113)	18.800 (15.888)	6.352 ° (3.676)	0.496 (2.962)
	high	62.551 (40.760)	59.066 *** (13.682)	55.581 (43.221)	-25.907 (15.870)	7.128 ° (3.653)	15.196 (33.658)	-10.577 (6.767)	2.986 * (1.286)	4.063 (6.359)	12.975 (18.035)	7.267 * (3.616)	1.898 (4.056)
Trade services and food	low	-7.013 (37.297)	14.375 (14.611)	35.763 (43.869)	2.228 (10.166)	8.157 * (4.122)	7.195 (16.285)	0.909 (4.154)	3.417 * (1.442)	1.924 (3.142)	37.064 * (18.620)	4.861 (3.762)	-3.157 (5.537)
	high	24.112 (44.855)	41.567 ** (14.233)	59.023 (51.839)	-27.065 (17.047)	3.999 (2.891)	12.533 (27.945)	-11.049 (7.253)	1.675 (1.118)	3.351 (5.315)	-5.289 (19.647)	8.758 * (3.864)	5.552 (8.924)
Recreation service	low	-136.259 ** (42.118)	-6.869 (18.345)	122.521 * (49.058)	-5.057 (11.576)	6.716 (4.166)	8.128 (18.379)	-2.064 (4.741)	2.813 ° (1.560)	2.173 (3.543)	8.502 (18.517)	5.808 (4.674)	1.808 (4.263)
	high	153.358 ** (56.658)	62.812 *** (14.224)	-27.735 (51.074)	-19.780 (17.677)	5.440 (3.298)	11.600 (25.909)	-8.075 (7.370)	2.279 ° (1.228)	3.102 (4.936)	23.273 (25.516)	7.812 * (3.870)	0.586 (3.573)
Health service	low	-3.090 (37.180)	3.332 (12.651)	9.754 (42.563)	4.176 (10.313)	9.768 * (4.434)	8.133 (18.273)	1.705 (4.222)	4.092 ** (1.469)	2.175 (3.501)	8.125 (16.412)	2.894 (3.162)	0.294 (2.896)
	high	20.189 (38.688)	52.610 *** (15.439)	85.032 ° (45.609)	-29.013 ° (16.519)	2.387 (2.811)	11.594 (25.824)	-11.845 ° (7.090)	1.000 (1.144)	3.100 (4.906)	23.650 (17.849)	10.726 * (4.350)	2.100 (4.381)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A7: Knowledge intensive production – Continued 2

Interaction with	Level	Knowledge intensive production														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-7.782 (25.715)	27.954 *** (8.147)	63.689 * (26.704)	5.333 (6.016)	5.863 * (2.508)	5.063 (10.463)	3.469 (3.723)	0.970 ° (0.506)	0.080 (0.237)	6.057 (8.318)	11.707 *** (3.180)	14.400 (10.840)	1.867 (7.793)	3.984 * (1.936)	3.151 (5.512)
Professional service	low	-0.222 (27.767)	11.951 (11.652)	24.123 (33.306)	4.605 (6.234)	8.005 * (3.718)	12.172 (13.574)	2.996 (3.919)	1.324 ° (0.731)	0.191 (0.462)	-3.326 (8.844)	10.626 ** (3.727)	18.718 (14.020)	2.001 (8.427)	-0.496 (2.299)	-1.072 (3.496)
	high	-15.342 (28.222)	43.957 ** (15.809)	103.255 * (42.761)	6.061 (6.589)	3.721 (4.647)	-2.045 (16.622)	3.943 (4.061)	0.616 (0.790)	-0.032 (0.270)	15.440 (10.074)	12.789 ** (4.793)	10.082 (10.693)	1.733 (8.519)	8.464 * (3.862)	7.375 (12.198)
Simple production	low	-8.329 (25.682)	45.632 *** (12.327)	99.593 ** (33.130)	9.360 (7.375)	6.570 ° (3.725)	-0.977 (12.766)	6.089 (4.305)	1.087 (0.696)	-0.015 (0.203)	8.190 (8.468)	11.620 ** (3.922)	12.898 (10.666)	-0.910 (7.765)	6.595 * (3.013)	6.435 (10.534)
	high	-7.234 (34.096)	10.275 (10.146)	27.785 (30.789)	1.306 (6.995)	5.157 ° (3.108)	11.103 (12.545)	0.850 (4.541)	0.853 (0.574)	0.175 (0.423)	3.924 (10.834)	11.795 ** (3.585)	15.902 (12.157)	4.644 (10.433)	1.373 (2.036)	-0.132 (2.837)
Primary and related production	low	22.252 (23.089)	43.770 *** (11.864)	65.289 ° (38.785)	-0.176 (4.661)	9.252 * (3.808)	24.871 (16.604)	-0.114 (3.032)	1.530 * (0.778)	0.391 (0.877)	3.427 (7.290)	14.037 *** (4.215)	19.720 (15.117)	9.656 (7.785)	3.307 (2.510)	0.147 (3.571)
	high	-37.815 (36.716)	12.137 (15.449)	62.089 * (31.654)	10.842 (9.628)	2.475 (4.602)	-14.744 (12.988)	7.053 (5.763)	0.409 (0.771)	-0.232 (0.537)	8.687 (11.917)	9.378 * (4.411)	9.080 (8.657)	-5.922 (11.306)	4.661 (3.289)	6.155 (10.077)
Large scale production	low	-7.385 (25.150)	41.069 *** (10.158)	89.523 ** (30.947)	6.311 (6.215)	5.469 ° (3.114)	2.098 (12.148)	4.106 (3.782)	0.905 (0.582)	0.033 (0.204)	-4.985 (8.074)	8.615 ** (3.142)	16.641 (12.561)	-9.925 (8.414)	-0.445 (1.997)	2.607 (4.981)
	high	-8.178 (29.727)	14.839 (10.163)	37.856 (31.696)	4.355 (6.442)	6.257 * (3.045)	8.029 (12.553)	2.833 (4.073)	1.035 ° (0.591)	0.126 (0.335)	17.099 (10.733)	14.799 *** (3.990)	12.159 (10.161)	13.659 (10.215)	8.413 ** (3.057)	3.696 (6.472)
Trade services and food	low	-48.187 ° (26.942)	38.896 *** (10.568)	125.979 *** (31.712)	12.441 (8.867)	4.186 (3.211)	-13.352 (13.057)	8.094 (5.035)	0.692 (0.570)	-0.210 (0.494)	0.412 (8.517)	8.702 ** (3.263)	13.322 (10.835)	-1.531 (8.164)	2.047 (2.159)	2.378 (4.736)
	high	32.624 (32.572)	17.011 (10.531)	1.399 (38.083)	-1.775 (6.656)	7.541 * (3.234)	23.479 (16.009)	-1.155 (4.311)	1.247 ° (0.652)	0.369 (0.829)	11.702 (10.846)	14.713 *** (4.036)	15.478 (12.641)	5.265 (9.984)	5.921 * (2.619)	3.925 (7.057)
Recreation service	low	5.503 (30.884)	18.097 (13.375)	30.690 (35.792)	2.854 (6.381)	5.001 (3.992)	7.648 (14.179)	1.857 (4.101)	0.827 (0.705)	0.120 (0.341)	11.199 (10.234)	14.274 ** (4.520)	15.115 (12.223)	-29.755 * (14.275)	-0.978 (2.627)	8.147 (13.193)
	high	-21.067 (41.548)	37.811 *** (10.541)	96.688 ** (37.161)	7.812 (9.432)	6.726 * (3.259)	2.479 (14.675)	5.082 (5.876)	1.113 ° (0.633)	0.039 (0.245)	0.915 (12.928)	9.141 ** (3.257)	13.685 (11.661)	33.489 ° (17.437)	8.946 ** (3.222)	-1.844 (4.462)
Health service	low	-0.149 (26.912)	40.325 *** (9.162)	80.799 ** (30.899)	2.727 (5.679)	2.491 (2.710)	1.245 (12.114)	1.774 (3.643)	0.412 (0.465)	0.020 (0.195)	1.050 (8.472)	10.110 ** (3.145)	15.111 (11.684)	-0.675 (8.123)	0.475 (1.807)	0.649 (3.008)
	high	-15.415 (27.970)	15.582 (11.387)	46.579 (33.269)	7.939 (7.211)	9.235 * (3.622)	8.882 (13.269)	5.164 (4.334)	1.528 * (0.753)	0.140 (0.364)	11.064 (9.484)	13.305 *** (3.984)	13.689 (11.172)	4.409 (8.602)	7.493 * (3.039)	5.654 (9.376)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A7: Knowledge intensive production – Continued 3

Interaction with	Level	Knowledge intensive production														
		Tax via GDP			Tax via GDP and household income			Tax via GDP and wages			Tax via GDP and joblessness			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-17.123 (13.913)	13.435 ** (4.466)	47.451 * (21.640)	-2.712 (2.623)	0.866 ° (0.497)	0.656 (1.785)	-1.423 (1.672)	3.759 ** (1.452)	17.386 (12.969)	-1.702 (1.777)	2.192 * (0.887)	11.154 (6.796)	-1.107 (1.090)	0.363 * (0.182)	0.175 (0.390)
Professional service	low	0.671 (14.514)	-3.765 (6.267)	-8.692 (19.328)	0.106 (2.299)	-0.243 (0.420)	-0.120 (0.419)	0.056 (1.207)	-1.053 (1.766)	-3.185 (7.327)	0.067 (1.443)	-0.614 (1.032)	-2.043 (4.618)	0.043 (0.939)	-0.102 (0.173)	-0.032 (0.100)
	high	-34.918 * (16.486)	30.636 *** (9.166)	103.595 * (41.576)	-5.530 (3.903)	1.974 ° (1.097)	1.432 (3.885)	-2.902 (2.819)	8.571 ** (3.068)	37.956 (27.095)	-3.470 (2.805)	4.999 ** (1.889)	24.351 ° (13.869)	-2.258 (1.647)	0.827 * (0.398)	0.383 (0.848)
Simple production	low	-12.714 (13.547)	21.546 ** (6.958)	59.641 * (26.914)	-2.014 (2.391)	1.388 ° (0.790)	0.824 (2.243)	-1.057 (1.440)	6.028 ** (2.279)	21.852 (16.238)	-1.264 (1.581)	3.516 * (1.396)	14.019 ° (8.492)	-0.822 (0.988)	0.582 * (0.289)	0.220 (0.490)
	high	-21.532 (18.470)	5.325 (5.453)	35.261 ° (21.146)	-3.410 (3.429)	0.343 (0.386)	0.487 (1.340)	-1.790 (2.160)	1.490 (1.553)	12.919 (10.872)	-2.140 (2.311)	0.869 (0.912)	8.289 (5.994)	-1.392 (1.423)	0.144 (0.157)	0.130 (0.294)
Primary and related production	low	-14.245 (12.359)	18.053 ** (6.636)	53.981 ° (28.331)	-2.256 (2.287)	1.163 ° (0.693)	0.746 (2.040)	-1.184 (1.437)	5.051 * (2.105)	19.778 (15.623)	-1.416 (1.540)	2.946 * (1.278)	12.689 (8.405)	-0.921 (0.949)	0.487 ° (0.257)	0.200 (0.447)
	high	-20.002 (19.620)	8.817 (8.433)	40.921 ° (22.435)	-3.168 (3.524)	0.568 (0.605)	0.566 (1.549)	-1.663 (2.157)	2.467 (2.408)	14.993 (12.079)	-1.988 (2.346)	1.439 (1.415)	9.619 (6.551)	-1.293 (1.458)	0.238 (0.245)	0.151 (0.340)
Large scale production	low	1.476 (13.065)	11.115 * (5.554)	21.800 (19.007)	0.234 (2.073)	0.716 (0.491)	0.301 (0.850)	0.123 (1.091)	3.109 ° (1.670)	7.987 (8.410)	0.147 (1.302)	1.814 ° (0.998)	5.124 (4.924)	0.095 (0.846)	0.300 (0.188)	0.081 (0.189)
	high	-35.723 * (17.299)	15.756 ** (5.494)	73.103 * (29.908)	-5.657 (4.040)	1.015 ° (0.593)	1.010 (2.743)	-2.969 (2.902)	4.408 * (1.764)	26.784 (19.238)	-3.550 (2.895)	2.571 * (1.075)	17.184 ° (9.881)	-2.310 (1.703)	0.425 ° (0.218)	0.270 (0.599)
Trade services and food	low	3.072 (13.971)	18.031 ** (6.094)	34.611 (21.472)	0.486 (2.227)	1.162 ° (0.671)	0.478 (1.318)	0.255 (1.181)	5.044 * (1.972)	12.681 (10.860)	0.305 (1.403)	2.942 * (1.204)	8.136 (6.024)	0.199 (0.910)	0.487 * (0.247)	0.128 (0.290)
	high	-37.318 * (18.881)	8.839 (5.461)	60.292 * (29.123)	-5.910 (4.308)	0.570 (0.442)	0.833 (2.272)	-3.102 (3.065)	2.473 (1.603)	22.090 (16.850)	-3.709 (3.073)	1.442 (0.951)	14.172 (8.925)	-2.413 (1.814)	0.239 (0.173)	0.223 (0.497)
Recreation service	low	-6.973 (15.746)	14.846 * (7.327)	39.100 (23.937)	-1.104 (2.560)	0.957 (0.651)	0.540 (1.487)	-0.580 (1.398)	4.153 ° (2.206)	14.326 (12.184)	-0.693 (1.630)	2.422 ° (1.320)	9.191 (6.742)	-0.451 (1.048)	0.401 (0.249)	0.145 (0.327)
	high	-27.274 (22.124)	12.024 * (5.721)	55.803 * (27.924)	-4.319 (4.173)	0.775 (0.517)	0.771 (2.105)	-2.267 (2.662)	3.364 ° (1.732)	20.445 (15.823)	-2.711 (2.828)	1.962 ° (1.037)	13.117 (8.437)	-1.763 (1.734)	0.325 (0.197)	0.206 (0.461)
Health service	low	5.758 (14.055)	21.593 *** (5.503)	39.127 ° (21.743)	0.912 (2.277)	1.391 ° (0.742)	0.541 (1.482)	0.479 (1.237)	6.041 ** (1.944)	14.336 (11.623)	0.572 (1.446)	3.523 ** (1.211)	9.197 (6.319)	0.372 (0.932)	0.583 * (0.265)	0.145 (0.325)
	high	-40.004 * (17.135)	5.278 (5.890)	55.776 * (26.315)	-6.336 (4.291)	0.340 (0.412)	0.771 (2.100)	-3.325 (3.161)	1.476 (1.673)	20.435 (15.443)	-3.976 (3.115)	0.861 (0.981)	13.111 (8.144)	-2.587 (1.816)	0.142 (0.168)	0.206 (0.459)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A7: Knowledge intensive production – Continued 4

Interaction with	Level	Knowledge intensive production														
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.703 (0.579)	0.334 ° (0.187)	-0.035 (0.607)	-0.329 (0.275)	0.026 (0.044)	-0.644 (0.437)	-0.107 (0.097)	0.091 ** (0.034)	0.338 ° (0.201)	0.144 (0.125)	0.002 (0.017)	0.414 ° (0.245)	0.066 (0.217)	0.004 (0.035)	0.555 ° (0.314)
Professional service	low	0.085 (0.625)	0.417 (0.267)	0.750 (0.761)	0.013 (0.279)	-0.007 (0.017)	0.118 (0.269)	0.004 (0.091)	-0.025 (0.043)	-0.062 (0.140)	-0.006 (0.122)	-0.001 (0.005)	-0.076 (0.171)	0.002 (0.234)	0.002 (0.015)	0.210 (0.301)
	high	1.321 * (0.635)	0.251 (0.360)	-0.819 (0.971)	-0.670 ° (0.342)	0.059 (0.100)	-1.405 (0.905)	-0.219 (0.136)	0.207 ** (0.072)	0.738 ° (0.409)	0.294 ° (0.166)	0.004 (0.038)	0.903 ° (0.499)	0.129 (0.241)	0.006 (0.054)	0.900 ° (0.506)
Simple production	low	0.608 (0.578)	0.615 * (0.284)	0.623 (0.757)	-0.244 (0.264)	0.041 (0.071)	-0.809 (0.547)	-0.080 (0.091)	0.146 ** (0.054)	0.425 ° (0.251)	0.107 (0.119)	0.003 (0.027)	0.520 ° (0.306)	0.070 (0.217)	0.007 (0.056)	0.868 * (0.438)
	high	0.798 (0.767)	0.053 (0.229)	-0.693 (0.694)	-0.413 (0.364)	0.010 (0.020)	-0.478 (0.375)	-0.135 (0.128)	0.036 (0.037)	0.251 (0.179)	0.181 (0.165)	0.001 (0.007)	0.307 (0.218)	0.061 (0.288)	0.002 (0.013)	0.242 (0.284)
Primary and related production	low	0.579 (0.521)	0.478 ° (0.272)	0.376 (0.877)	-0.273 (0.243)	0.035 (0.059)	-0.732 (0.533)	-0.089 (0.085)	0.122 * (0.050)	0.385 (0.250)	0.120 (0.110)	0.003 (0.022)	0.470 (0.305)	-0.187 (0.203)	0.006 (0.054)	0.569 (0.401)
	high	0.827 (0.827)	0.191 (0.349)	-0.446 (0.717)	-0.384 (0.384)	0.017 (0.033)	-0.555 (0.413)	-0.126 (0.133)	0.060 (0.058)	0.292 (0.195)	0.168 (0.173)	0.001 (0.011)	0.357 (0.238)	0.318 (0.324)	0.002 (0.015)	0.541 (0.344)
Large scale production	low	1.005 ° (0.568)	0.168 (0.234)	-0.668 (0.710)	0.028 (0.251)	0.021 (0.037)	-0.296 (0.298)	0.009 (0.082)	0.075 ° (0.040)	0.155 (0.148)	-0.012 (0.110)	0.002 (0.014)	0.190 (0.181)	0.062 (0.213)	0.006 (0.051)	0.780 ° (0.401)
	high	0.401 (0.670)	0.500 * (0.230)	0.599 (0.715)	-0.685 ° (0.358)	0.030 (0.052)	-0.992 (0.644)	-0.224 (0.141)	0.106 * (0.042)	0.521 ° (0.291)	0.301 ° (0.172)	0.002 (0.019)	0.637 ° (0.356)	0.069 (0.251)	0.002 (0.018)	0.330 (0.303)
Trade services and food	low	0.334 (0.610)	0.485 * (0.244)	0.636 (0.734)	0.059 (0.268)	0.035 (0.059)	-0.469 (0.375)	0.019 (0.088)	0.122 ** (0.047)	0.247 (0.180)	-0.026 (0.118)	0.003 (0.022)	0.302 (0.219)	0.406 (0.259)	0.006 (0.048)	1.098 * (0.500)
	high	1.072 (0.734)	0.183 (0.238)	-0.706 (0.857)	-0.716 ° (0.389)	0.017 (0.030)	-0.818 (0.571)	-0.234 (0.151)	0.060 (0.038)	0.430 (0.265)	0.314 ° (0.186)	0.001 (0.011)	0.525 (0.323)	-0.275 (0.287)	0.002 (0.021)	0.012 (0.332)
Recreation service	low	1.623 * (0.695)	0.363 (0.302)	-0.898 (0.806)	-0.134 (0.303)	0.028 (0.050)	-0.530 (0.420)	-0.044 (0.100)	0.100 ° (0.053)	0.279 (0.201)	0.059 (0.134)	0.002 (0.018)	0.341 (0.245)	-0.046 (0.260)	0.003 (0.022)	0.267 (0.328)
	high	-0.217 (0.935)	0.305 (0.244)	0.828 (0.846)	-0.523 (0.437)	0.023 (0.040)	-0.757 (0.537)	-0.171 (0.155)	0.081 * (0.041)	0.398 (0.250)	0.230 (0.199)	0.002 (0.015)	0.486 (0.305)	0.177 (0.354)	0.006 (0.047)	0.843 ° (0.455)
Health service	low	0.738 (0.605)	0.265 (0.212)	-0.207 (0.702)	0.110 (0.271)	0.041 (0.070)	-0.531 (0.398)	0.036 (0.089)	0.146 ** (0.045)	0.279 (0.188)	-0.048 (0.119)	0.003 (0.027)	0.341 (0.229)	0.001 (0.227)	0.006 (0.050)	0.704 ° (0.379)
	high	0.668 (0.630)	0.403 (0.258)	0.137 (0.753)	-0.768 * (0.362)	0.010 (0.020)	-0.757 (0.522)	-0.251 ° (0.147)	0.036 (0.040)	0.398 (0.241)	0.337 ° (0.177)	0.001 (0.007)	0.486 ° (0.294)	0.130 (0.239)	0.002 (0.019)	0.406 (0.328)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A7: Knowledge intensive production – Continued 5

Interaction with	Level	Knowledge intensive production		
			Population development via joblessness	
None		0.337 (0.337)	0.243 * (0.098)	0.154 (0.317)
Professional service	low	0.291 (0.364)	0.331 * (0.146)	0.369 (0.409)
	high	0.383 (0.365)	0.154 (0.191)	-0.062 (0.504)
Simple production	low	0.591 ° (0.350)	0.272 ° (0.149)	-0.030 (0.387)
	high	0.083 (0.440)	0.213 ° (0.125)	0.337 (0.378)
Primary and related production	low	-0.011 (0.294)	0.383 ** (0.147)	0.754 (0.493)
	high	0.685 (0.493)	0.102 (0.190)	-0.447 (0.389)
Large scale production	low	0.399 (0.333)	0.226 ° (0.125)	0.064 (0.368)
	high	0.275 (0.381)	0.259 * (0.120)	0.243 (0.379)
Trade services and food	low	0.786 * (0.383)	0.173 (0.130)	-0.405 (0.392)
	high	-0.112 (0.416)	0.312 * (0.126)	0.712 (0.476)
Recreation service	low	0.180 (0.392)	0.207 (0.162)	0.232 (0.429)
	high	0.493 (0.538)	0.278 * (0.129)	0.075 (0.445)
Health service	low	0.172 (0.347)	0.103 (0.111)	0.038 (0.367)
	high	0.501 (0.373)	0.382 ** (0.139)	0.269 (0.401)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A8: Health service

Interaction with	Level	Health service											
		GDP direct			Joblessness direct			Joblessness via GDP			Wage direct		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		2.231 ° (1.181)	0.410 (0.445)	-1.411 (1.226)	0.536 (0.502)	0.790 *** (0.190)	1.044 * (0.526)	-0.239 (0.161)	-0.052 (0.057)	0.203 (0.199)	-61.280 * (27.114)	-20.122 ° (10.502)	21.037 (28.645)
Professional service	low	1.124 (1.462)	-2.185 *** (0.569)	-5.494 *** (1.658)	0.969 (0.618)	0.716 ** (0.245)	0.464 (0.711)	-0.121 (0.165)	0.275 ** (0.090)	0.792 ° (0.430)	-106.869 ** (33.588)	-28.028 * (13.338)	50.813 (38.513)
	high	3.338 * (1.390)	3.005 *** (0.898)	2.671 (2.202)	0.103 (0.593)	0.863 * (0.387)	1.623 ° (0.941)	-0.358 ° (0.210)	-0.378 ** (0.135)	-0.385 (0.362)	-15.691 (31.967)	-12.215 (21.086)	-8.740 (50.950)
Simple production	low	-1.769 (1.264)	-0.460 (0.706)	0.849 (1.542)	-0.160 (0.536)	0.918 ** (0.300)	1.997 ** (0.662)	0.190 (0.157)	0.058 (0.090)	-0.122 (0.229)	-60.438 * (28.904)	-11.993 (16.520)	36.451 (36.240)
	high	6.232 *** (1.709)	1.280 ** (0.467)	-3.672 * (1.603)	1.231 ° (0.735)	0.661 *** (0.200)	0.091 (0.684)	-0.669 * (0.331)	-0.161 * (0.067)	0.529 (0.332)	-62.122 (39.824)	-28.250 ** (10.906)	5.622 (36.931)
Primary and related production	low	2.381 * (1.096)	-0.368 (0.624)	-3.118 ° (1.793)	0.978 * (0.465)	1.107 *** (0.269)	1.236 (0.766)	-0.256 (0.158)	0.046 (0.079)	0.449 (0.328)	-142.790 *** (25.614)	-50.472 *** (14.811)	41.846 (41.807)
	high	2.081 (1.942)	1.188 (0.752)	0.295 (1.520)	0.094 (0.825)	0.473 (0.318)	0.852 (0.647)	-0.223 (0.228)	-0.149 (0.099)	-0.043 (0.220)	20.230 (44.486)	10.229 (17.247)	0.228 (34.902)
Large scale production	low	0.470 (1.414)	0.353 (0.586)	0.236 (1.551)	0.462 (0.597)	0.672 ** (0.249)	0.883 (0.659)	-0.050 (0.153)	-0.044 (0.074)	-0.034 (0.224)	-71.179 * (32.241)	-6.866 (13.554)	57.447 (35.761)
	high	3.992 ** (1.485)	0.466 (0.566)	-3.059 ° (1.585)	0.609 (0.635)	0.907 *** (0.240)	1.205 ° (0.680)	-0.428 ° (0.238)	-0.059 (0.072)	0.441 (0.303)	-51.381 (34.247)	-33.377 * (13.241)	-15.374 (36.870)
Trade services and food	low	4.777 ** (1.664)	1.636 * (0.738)	-1.505 (1.739)	0.148 (0.710)	0.832 ** (0.316)	1.516 * (0.738)	-0.513 ° (0.277)	-0.206 * (0.101)	0.217 (0.269)	-57.490 (38.244)	-11.215 (17.319)	35.060 (40.270)
	high	-0.315 (1.469)	-0.816 (0.518)	-1.317 (1.548)	0.923 (0.626)	0.747 *** (0.219)	0.572 (0.663)	0.034 (0.158)	0.103 (0.068)	0.190 (0.239)	-65.070 ° (33.855)	-29.028 * (11.998)	7.014 (35.759)
Recreation service	low	1.680 (1.617)	0.167 (0.689)	-1.346 (1.517)	1.102 (0.689)	0.951 ** (0.291)	0.799 (0.653)	-0.180 (0.189)	-0.021 (0.087)	0.194 (0.235)	-45.357 (37.281)	-10.397 (15.975)	24.563 (35.523)
	high	2.782 (1.850)	0.653 (0.621)	-1.477 (1.293)	-0.031 (0.783)	0.629 * (0.264)	1.289 * (0.549)	-0.299 (0.234)	-0.082 (0.080)	0.213 (0.210)	-77.203 ° (42.165)	-29.846 * (14.365)	17.511 (29.852)
Knowledge intensive production	low	5.222 *** (1.295)	1.418 * (0.666)	-2.386 (1.669)	0.903 (0.558)	1.111 *** (0.289)	1.318 ° (0.718)	-0.560 * (0.269)	-0.178 * (0.091)	0.344 (0.286)	-85.892 ** (30.218)	-29.699 ° (15.861)	26.495 (38.926)
	high	-0.760 (1.380)	-0.598 (0.548)	-0.436 (1.774)	0.168 (0.586)	0.469 * (0.232)	0.769 (0.750)	0.082 (0.152)	0.075 (0.070)	0.063 (0.257)	-36.668 (31.579)	-10.545 (12.627)	15.578 (40.637)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A8: Health service – Continued 1

Interaction with	Level	Health service											
		Household income direct			Household income via GDP			Household income via GDP and joblessness			Household income via joblessness		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-33.875 (25.128)	-26.483 ** (9.731)	-19.091 (26.357)	12.782 (8.818)	1.550 (1.792)	-2.586 (6.121)	5.218 (3.727)	0.649 (0.729)	-0.691 (1.227)	-11.675 (11.315)	-9.947 ** (3.147)	-3.548 (5.545)
Professional service	low	2.376 (31.403)	-10.421 (12.348)	-23.219 (35.524)	6.441 (8.847)	-8.260 * (3.928)	-10.067 (22.374)	2.630 (3.645)	-3.460 ** (1.335)	-2.692 (4.242)	-21.106 (14.433)	-9.023 * (3.600)	-1.578 (3.361)
	high	-70.127 * (29.401)	-42.545 * (19.419)	-14.964 (46.892)	19.122 (11.617)	11.360 * (5.654)	4.895 (11.510)	7.807 (4.957)	4.759 * (1.965)	1.309 (2.294)	-2.243 (12.934)	-10.871 * (5.367)	-5.517 (8.767)
Simple production	low	-8.476 (26.766)	-33.821 * (15.275)	-59.165 ° (33.408)	-10.137 (8.516)	-1.740 (2.759)	1.556 (4.440)	-4.139 (3.560)	-0.729 (1.138)	0.416 (0.992)	3.479 (11.723)	-11.569 ** (4.472)	-6.786 (10.289)
	high	-59.275 (36.749)	-19.146 ° (10.118)	20.982 (33.974)	35.700 ° (18.584)	4.839 ° (2.613)	-6.728 (15.102)	14.575 ° (8.050)	2.027 * (0.938)	-1.799 (2.891)	-26.828 (17.316)	-8.326 ** (3.042)	-0.309 (2.369)
Primary and related production	low	-31.978 (25.099)	-48.073 *** (13.868)	-64.169 ° (38.633)	13.641 (8.709)	-1.393 (2.425)	-5.713 (13.002)	5.569 (3.701)	-0.584 (1.003)	-1.528 (2.521)	-21.306 ° (11.412)	-13.940 ** (4.437)	-4.200 (6.738)
	high	-35.773 (41.023)	-4.893 (15.871)	25.986 (32.325)	11.922 (12.312)	4.492 (3.358)	0.541 (3.030)	4.867 (5.106)	1.882 (1.306)	0.145 (0.778)	-2.044 (17.982)	-5.955 (4.192)	-2.895 (4.814)
Large scale production	low	-17.384 (29.856)	-19.209 (12.499)	-21.034 (33.003)	2.695 (8.189)	1.336 (2.278)	0.433 (2.998)	1.100 (3.349)	0.560 (0.941)	0.116 (0.781)	-10.072 (13.250)	-8.470 * (3.585)	-3.001 (4.973)
	high	-50.366 (31.610)	-33.758 ** (12.291)	-17.149 (33.908)	22.868 ° (13.220)	1.763 (2.253)	-5.605 (12.679)	9.336 (5.666)	0.739 (0.921)	-1.499 (2.445)	-13.277 (14.218)	-11.424 ** (3.834)	-4.095 (6.484)
Trade services and food	low	-33.196 (35.269)	-27.350 ° (15.969)	-21.503 (37.121)	27.370 ° (15.411)	6.186 ° (3.721)	-2.758 (6.858)	11.174 ° (6.622)	2.591 ° (1.383)	-0.737 (1.424)	-3.235 (15.492)	-10.481 * (4.530)	-5.152 (8.025)
	high	-34.554 (31.363)	-25.617 * (11.125)	-16.680 (32.913)	-1.807 (8.453)	-3.086 (2.310)	-2.414 (6.025)	-0.738 (3.454)	-1.293 (0.899)	-0.645 (1.254)	-20.114 (14.512)	-9.413 ** (3.375)	-1.943 (3.653)
Recreation service	low	-98.624 ** (34.345)	-51.430 *** (14.701)	-4.237 (32.693)	9.623 (10.194)	0.631 (2.619)	-2.466 (6.100)	3.929 (4.224)	0.264 (1.094)	-0.659 (1.262)	-24.019 (16.130)	-11.972 ** (4.422)	-2.715 (4.589)
	high	30.874 (39.023)	-1.536 (13.329)	-33.946 (27.461)	15.940 (12.729)	2.468 (2.545)	-2.706 (6.411)	6.508 (5.334)	1.034 (1.027)	-0.723 (1.286)	0.669 (17.062)	-7.922 * (3.708)	-4.380 (6.744)
Knowledge intensive production	low	-45.893 (28.102)	-51.923 *** (14.679)	-57.953 (35.820)	29.915 * (15.172)	5.360 (3.301)	-4.373 (10.102)	12.213 ° (6.592)	2.245 ° (1.234)	-1.169 (1.985)	-19.689 (13.094)	-13.991 ** (4.639)	-4.480 (7.063)
	high	-21.858 (29.118)	-1.044 (11.635)	19.770 (37.370)	-4.352 (8.140)	-2.261 (2.257)	-0.799 (3.697)	-1.777 (3.339)	-0.947 (0.908)	-0.214 (0.930)	-3.660 (12.806)	-5.904 ° (3.159)	-2.615 (4.635)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A8: Health service – Continued 2

Interaction with	Level	Health service														
		Tax direct			Tax via joblessness			Tax via joblessness and household income			Tax via wages			Tax via household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		-35.787 * (18.211)	-14.259 * (7.099)	7.269 (19.076)	-3.919 (4.284)	-8.565 *** (2.561)	-15.004 ° (8.538)	-2.549 (2.642)	-1.417 * (0.599)	-0.236 (0.522)	-12.873 ° (7.029)	-3.466 ° (1.954)	2.829 (4.280)	-7.397 (6.122)	-3.772 * (1.743)	-1.269 (2.653)
Professional service	low	-40.729 ° (22.688)	-35.071 *** (9.028)	-29.413 (25.759)	-7.085 (6.025)	-7.769 ** (2.994)	-6.673 (10.378)	-4.609 (3.577)	-1.285 * (0.626)	-0.105 (0.278)	-22.449 * (10.069)	-4.828 ° (2.518)	6.833 (6.864)	0.519 (6.860)	-1.484 (1.807)	-1.544 (3.383)
	high	-30.845 (21.511)	6.553 (14.163)	43.950 (33.871)	-0.753 (4.358)	-9.360 * (4.519)	-23.334 (14.869)	-0.490 (2.830)	-1.548 ° (0.879)	-0.367 (0.819)	-3.296 (6.797)	-2.104 (3.660)	-1.175 (6.895)	-15.314 ° (8.532)	-6.060 ° (3.245)	-0.995 (3.487)
Simple production	low	-32.985 ° (19.490)	7.821 (11.112)	48.628 * (24.445)	1.168 (3.979)	-9.961 ** (3.710)	-28.701 * (12.166)	0.760 (2.575)	-1.648 * (0.786)	-0.451 (0.985)	-12.696 ° (7.306)	-2.066 (2.880)	4.902 (5.847)	-1.851 (5.884)	-4.817 ° (2.560)	-3.934 (6.560)
	high	-38.588 (26.648)	-36.340 *** (7.345)	-34.091 (24.580)	-9.006 (7.383)	-7.168 ** (2.513)	-1.306 (9.839)	-5.859 (4.350)	-1.186 * (0.546)	-0.021 (0.161)	-13.050 (9.350)	-4.867 * (2.146)	0.756 (4.991)	-12.944 (9.325)	-2.727 ° (1.631)	1.395 (3.146)
Primary and related production	low	-41.648 * (18.188)	-15.158 (10.238)	11.332 (28.177)	-7.152 (5.268)	-12.002 *** (3.614)	-17.764 (11.974)	-4.653 (3.021)	-1.985 * (0.842)	-0.279 (0.627)	-29.995 ** (11.003)	-8.695 ** (3.154)	5.627 (6.736)	-6.983 (6.050)	-6.847 * (2.753)	-4.267 (7.171)
	high	-29.925 (29.668)	-13.360 (11.501)	3.206 (23.392)	-0.686 (6.046)	-5.127 (3.570)	-12.243 (9.841)	-0.446 (3.930)	-0.848 (0.643)	-0.192 (0.440)	4.250 (9.443)	1.762 (2.995)	0.031 (4.693)	-7.812 (9.406)	-0.697 (2.269)	1.728 (3.460)
Large scale production	low	-30.562 (21.573)	-10.825 (9.057)	8.912 (23.851)	-3.381 (4.765)	-7.293 * (2.994)	-12.690 (10.054)	-2.199 (3.004)	-1.206 * (0.612)	-0.200 (0.455)	-14.952 ° (8.292)	-1.183 (2.348)	7.725 (7.005)	-3.796 (6.667)	-2.736 (1.938)	-1.399 (3.104)
	high	-41.011 ° (22.964)	-17.693 * (8.975)	5.625 (24.608)	-4.457 (5.278)	-9.836 ** (3.141)	-17.317 (10.792)	-2.899 (3.282)	-1.627 * (0.711)	-0.272 (0.607)	-10.793 (7.980)	-5.750 * (2.590)	-2.067 (5.142)	-10.999 (7.996)	-4.808 * (2.208)	-1.140 (2.878)
Trade services and food	low	-38.465 (25.513)	-5.288 (11.588)	27.889 (26.823)	-1.086 (5.229)	-9.024 * (3.788)	-21.789 ° (12.072)	-0.706 (3.393)	-1.493 ° (0.769)	-0.343 (0.757)	-12.077 (8.915)	-1.932 (3.012)	4.714 (6.244)	-7.249 (8.148)	-3.896 (2.522)	-1.430 (3.336)
	high	-33.108 (22.809)	-23.230 ** (8.097)	-13.352 (23.845)	-6.752 (5.948)	-8.105 ** (2.783)	-8.218 (9.773)	-4.392 (3.555)	-1.341 * (0.610)	-0.129 (0.316)	-13.669 (8.349)	-5.001 * (2.326)	0.943 (4.849)	-7.546 (7.387)	-3.649 ° (1.885)	-1.109 (2.796)
Recreation service	low	-15.936 (25.317)	0.351 (10.803)	16.639 (23.742)	-8.063 (6.777)	-10.308 ** (3.656)	-11.483 (9.864)	-5.245 (4.014)	-1.705 * (0.790)	-0.181 (0.416)	-9.528 (8.404)	-1.791 (2.778)	3.303 (5.250)	-21.537 * (10.894)	-7.325 * (2.931)	-0.282 (2.218)
	high	-55.638 * (28.266)	-28.869 ** (9.651)	-2.101 (19.879)	0.225 (5.729)	-6.821 * (3.114)	-18.524 * (9.292)	0.146 (3.726)	-1.128 ° (0.615)	-0.291 (0.640)	-16.218 (10.266)	-5.141 ° (2.707)	2.355 (4.304)	6.742 (8.873)	-0.219 (1.900)	-2.257 (3.985)
Knowledge intensive production	low	-27.906 (20.374)	-1.485 (10.786)	24.935 (25.988)	-6.609 (5.521)	-12.046 ** (3.795)	-18.946 ° (11.473)	-4.300 (3.266)	-1.993 * (0.865)	-0.298 (0.663)	-18.043 * (8.581)	-5.116 ° (2.942)	3.563 (5.737)	-10.022 (7.154)	-7.396 * (2.942)	-3.853 (6.499)
	high	-43.668 * (21.081)	-27.033 ** (8.405)	-10.398 (27.013)	-1.229 (4.343)	-5.083 ° (2.669)	-11.061 (11.176)	-0.799 (2.812)	-0.841 ° (0.508)	-0.174 (0.412)	-7.703 (7.077)	-1.817 (2.209)	2.095 (5.636)	-4.773 (6.595)	-0.149 (1.658)	1.315 (3.229)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A8: Health service – Continued 3

Interaction with	Level	Health service														
		Tax via GDP			Tax via GDP and household income			Tax via GDP and wages			Tax via GDP and joblessness			Tax via GDP and joblessness and household income		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		17.624 ° (10.204)	3.426 (3.747)	-12.440 (11.565)	2.791 (2.181)	0.221 (0.263)	-0.172 (0.488)	1.465 (1.505)	0.958 (1.065)	-4.558 (5.019)	1.752 (1.533)	0.559 (0.625)	-2.924 (2.964)	1.140 (0.915)	0.092 (0.107)	-0.046 (0.109)
Professional service	low	8.881 (11.736)	-18.260 *** (5.323)	-48.431 * (21.702)	1.407 (2.000)	-1.177 ° (0.649)	-0.669 (1.821)	0.738 (1.159)	-5.108 ** (1.796)	-17.744 (13.151)	0.883 (1.302)	-2.979 ** (1.108)	-11.384 ° (6.869)	0.574 (0.823)	-0.493 * (0.235)	-0.179 (0.398)
	high	26.367 * (12.600)	25.111 ** (8.199)	23.550 (20.922)	4.176 (2.964)	1.618 ° (0.924)	0.326 (0.920)	2.192 (2.135)	7.025 ** (2.677)	8.628 (9.204)	2.621 (2.127)	4.097 * (1.638)	5.536 (5.403)	1.705 (1.250)	0.678 * (0.338)	0.087 (0.205)
Simple production	low	-13.978 (10.507)	-3.846 (5.924)	7.484 (13.813)	-2.214 (2.029)	-0.248 (0.399)	0.103 (0.337)	-1.162 (1.317)	-1.076 (1.671)	2.742 (5.314)	-1.389 (1.386)	-0.628 (0.977)	1.759 (3.324)	-0.904 (0.845)	-0.104 (0.165)	0.028 (0.079)
	high	49.226 ** (17.766)	10.697 * (4.148)	-32.365 ° (17.737)	7.796 (4.965)	0.689 (0.419)	-0.447 (1.225)	4.092 (3.774)	2.993 * (1.301)	-11.858 (9.552)	4.892 (3.663)	1.745 * (0.788)	-7.608 (5.180)	3.183 (2.110)	0.289 ° (0.156)	-0.120 (0.269)
Primary and related production	low	18.809 ° (9.717)	-3.079 (5.235)	-27.486 (18.240)	2.979 (2.193)	-0.198 (0.350)	-0.380 (1.050)	1.563 (1.553)	-0.861 (1.474)	-10.070 (8.945)	1.869 (1.561)	-0.502 (0.862)	-6.461 (5.020)	1.216 (0.923)	-0.083 (0.145)	-0.102 (0.231)
	high	16.439 (15.817)	9.931 (6.416)	2.605 (13.428)	2.603 (2.853)	0.640 (0.511)	0.036 (0.209)	1.366 (1.753)	2.778 (1.876)	0.954 (4.952)	1.634 (1.903)	1.620 (1.112)	0.612 (3.166)	1.063 (1.181)	0.268 (0.201)	0.010 (0.054)
Large scale production	low	3.716 (11.205)	2.954 (4.911)	2.084 (13.693)	0.588 (1.801)	0.190 (0.329)	0.029 (0.204)	0.309 (0.968)	0.826 (1.383)	0.764 (5.037)	0.369 (1.140)	0.482 (0.809)	0.490 (3.225)	0.240 (0.737)	0.080 (0.136)	0.008 (0.053)
	high	31.532 * (13.870)	3.898 (4.760)	-26.965 (16.582)	4.994 (3.419)	0.251 (0.329)	-0.373 (1.026)	2.621 (2.506)	1.090 (1.349)	-9.880 (8.422)	3.134 (2.475)	0.636 (0.790)	-6.339 (4.664)	2.039 (1.446)	0.105 (0.134)	-0.100 (0.226)
Trade services and food	low	37.739 * (15.848)	13.674 * (6.425)	-13.268 (15.945)	5.977 (4.017)	0.881 (0.585)	-0.183 (0.539)	3.137 (2.971)	3.825 * (1.948)	-4.861 (6.509)	3.751 (2.922)	2.231 ° (1.168)	-3.119 (3.954)	2.440 (1.701)	0.369 ° (0.222)	-0.049 (0.122)
	high	-2.491 (11.618)	-6.822 (4.418)	-11.613 (14.182)	-0.394 (1.852)	-0.440 (0.351)	-0.161 (0.473)	-0.207 (0.982)	-1.909 (1.292)	-4.255 (5.771)	-0.248 (1.166)	-1.113 (0.765)	-2.730 (3.511)	-0.161 (0.756)	-0.184 (0.138)	-0.043 (0.107)
Recreation service	low	13.269 (13.145)	1.395 (5.765)	-11.865 (13.935)	2.101 (2.356)	0.090 (0.374)	-0.164 (0.480)	1.103 (1.439)	0.390 (1.615)	-4.347 (5.714)	1.319 (1.567)	0.228 (0.942)	-2.789 (3.464)	0.858 (0.975)	0.038 (0.156)	-0.044 (0.109)
	high	21.979 (15.495)	5.456 (5.239)	-13.016 (12.188)	3.481 (3.059)	0.352 (0.376)	-0.180 (0.511)	1.827 (2.016)	1.527 (1.496)	-4.769 (5.279)	2.184 (2.104)	0.890 (0.879)	-3.060 (3.120)	1.421 (1.276)	0.147 (0.152)	-0.048 (0.114)
Knowledge intensive production	low	41.248 ** (14.079)	11.848 * (5.782)	-21.035 (16.277)	6.533 (4.089)	0.763 (0.516)	-0.291 (0.812)	3.429 (3.137)	3.315 ° (1.744)	-7.707 (7.501)	4.100 (3.032)	1.933 ° (1.044)	-4.945 (4.316)	2.667 (1.741)	0.320 (0.197)	-0.078 (0.180)
	high	-6.000 (10.995)	-4.997 (4.623)	-3.846 (15.693)	-0.950 (1.811)	-0.322 (0.334)	-0.053 (0.260)	-0.499 (1.007)	-1.398 (1.322)	-1.409 (5.810)	-0.596 (1.161)	-0.815 (0.777)	-0.904 (3.707)	-0.388 (0.743)	-0.135 (0.135)	-0.014 (0.066)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A8: Health service – Continued 4

Interaction with	Level	Health service														
		Population development direct			Population development via GDP			Population development via GDP and joblessness			Population development via GDP and taxes			Population development via taxes		
		Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote	Central	Medium	Remote
None		0.249 (0.416)	-0.444 ** (0.161)	-1.137 ** (0.434)	0.338 (0.207)	0.007 (0.013)	0.169 (0.178)	0.111 (0.078)	0.023 (0.026)	-0.089 (0.089)	-0.148 (0.097)	0.001 (0.004)	-0.108 (0.109)	0.301 ° (0.179)	-0.002 (0.018)	0.063 (0.168)
Professional service	low	0.434 (0.514)	-0.628 ** (0.208)	-1.690 ** (0.581)	0.170 (0.228)	-0.035 (0.060)	0.657 (0.443)	0.056 (0.077)	-0.123 ** (0.042)	-0.345 ° (0.203)	-0.075 (0.101)	-0.003 (0.023)	-0.422 ° (0.248)	0.343 (0.218)	-0.005 (0.043)	-0.256 (0.245)
	high	0.064 (0.492)	-0.260 (0.319)	-0.585 (0.772)	0.506 ° (0.261)	0.048 (0.082)	-0.319 (0.326)	0.166 (0.103)	0.170 ** (0.063)	0.168 (0.162)	-0.222 ° (0.126)	0.004 (0.031)	0.205 (0.198)	0.260 (0.198)	0.001 (0.008)	0.383 (0.329)
Simple production	low	-0.053 (0.445)	-0.431 ° (0.251)	-0.808 (0.554)	-0.268 (0.208)	-0.007 (0.017)	-0.102 (0.194)	-0.088 (0.075)	-0.026 (0.040)	0.053 (0.101)	0.118 (0.096)	-0.001 (0.005)	0.065 (0.123)	0.278 (0.185)	0.001 (0.010)	0.424 (0.267)
	high	0.552 (0.604)	-0.457 ** (0.172)	-1.467 ** (0.563)	0.945 * (0.388)	0.020 (0.035)	0.439 (0.327)	0.309 ° (0.166)	0.072 * (0.031)	-0.231 (0.154)	-0.415 * (0.196)	0.002 (0.013)	-0.282 (0.188)	0.325 (0.246)	-0.005 (0.045)	-0.297 (0.242)
Primary and related production	low	0.630 (0.414)	-0.477 * (0.231)	-1.585 * (0.636)	0.361 ° (0.199)	-0.006 (0.014)	0.373 (0.311)	0.118 (0.077)	-0.021 (0.036)	-0.196 (0.150)	-0.158 ° (0.095)	0.000 (0.004)	-0.240 (0.183)	0.351 ° (0.187)	-0.002 (0.019)	0.099 (0.248)
	high	-0.131 (0.674)	-0.411 (0.259)	-0.690 (0.532)	0.315 (0.310)	0.019 (0.034)	-0.035 (0.183)	0.103 (0.108)	0.067 (0.045)	0.019 (0.096)	-0.138 (0.140)	0.001 (0.012)	0.023 (0.117)	0.252 (0.262)	-0.002 (0.017)	0.028 (0.204)
Large scale production	low	-0.265 (0.494)	-0.377 ° (0.205)	-0.489 (0.552)	0.071 (0.215)	0.006 (0.013)	-0.028 (0.186)	0.023 (0.071)	0.020 (0.033)	0.015 (0.098)	-0.031 (0.095)	0.000 (0.004)	0.018 (0.120)	0.257 (0.198)	-0.002 (0.013)	0.078 (0.210)
	high	0.763 (0.520)	-0.511 * (0.204)	-1.786 ** (0.554)	0.605 * (0.291)	0.007 (0.016)	0.366 (0.291)	0.198 ° (0.118)	0.026 (0.033)	-0.192 (0.139)	-0.266 ° (0.142)	0.001 (0.005)	-0.235 (0.170)	0.345 (0.220)	-0.003 (0.022)	0.049 (0.215)
Trade services and food	low	0.262 (0.582)	-0.327 (0.261)	-0.916 (0.610)	0.724 * (0.336)	0.026 (0.046)	0.180 (0.235)	0.237 ° (0.137)	0.092 * (0.046)	-0.095 (0.119)	-0.318 ° (0.165)	0.002 (0.017)	-0.116 (0.146)	0.324 (0.237)	-0.001 (0.007)	0.243 (0.251)
	high	0.237 (0.516)	-0.561 ** (0.184)	-1.359 * (0.539)	-0.048 (0.223)	-0.013 (0.024)	0.158 (0.208)	-0.016 (0.073)	-0.046 (0.031)	-0.083 (0.106)	0.021 (0.098)	-0.001 (0.008)	-0.101 (0.129)	0.279 (0.210)	-0.003 (0.029)	-0.116 (0.212)
Recreation service	low	0.324 (0.571)	-0.471 ° (0.243)	-1.266 * (0.536)	0.255 (0.257)	0.003 (0.012)	0.161 (0.206)	0.083 (0.089)	0.009 (0.039)	-0.085 (0.104)	-0.112 (0.116)	0.000 (0.002)	-0.103 (0.128)	0.134 (0.217)	0.000 (0.002)	0.145 (0.214)
	high	0.175 (0.646)	-0.417 ° (0.220)	-1.009 * (0.457)	0.422 (0.309)	0.010 (0.020)	0.177 (0.188)	0.138 (0.112)	0.037 (0.036)	-0.093 (0.094)	-0.185 (0.142)	0.001 (0.007)	-0.113 (0.115)	0.469 ° (0.278)	-0.004 (0.036)	-0.018 (0.173)
Knowledge intensive production	low	0.285 (0.464)	-0.515 * (0.243)	-1.315 * (0.591)	0.791 * (0.311)	0.023 (0.040)	0.285 (0.263)	0.259 ° (0.136)	0.080 ° (0.042)	-0.150 (0.129)	-0.347 * (0.159)	0.002 (0.015)	-0.183 (0.158)	0.235 (0.186)	0.000 (0.002)	0.217 (0.241)
	high	0.213 (0.481)	-0.373 ° (0.192)	-0.960 (0.610)	-0.115 (0.212)	-0.010 (0.018)	0.052 (0.214)	-0.038 (0.071)	-0.034 (0.032)	-0.027 (0.112)	0.051 (0.094)	-0.001 (0.006)	-0.034 (0.137)	0.368 ° (0.210)	-0.004 (0.033)	-0.091 (0.238)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.

Source: Own calculation.

Table A8: Health service – Continued 5

Interaction with	Level	Health service					
		Population development via joblessness			Population development via wages and taxes		
		Central	Medium	Remote	Central	Medium	Remote
None		-0.248 (0.238)	-0.355 *** (0.093)	-0.455 ° (0.252)	0.108 (0.068)	-0.001 (0.004)	0.025 (0.038)
Professional service	low	-0.448 (0.301)	-0.322 ** (0.115)	-0.202 (0.314)	0.189 ° (0.103)	-0.001 (0.006)	0.060 (0.064)
	high	-0.048 (0.274)	-0.388 * (0.178)	-0.708 (0.441)	0.028 (0.058)	0.000 (0.003)	-0.010 (0.060)
Simple production	low	0.074 (0.248)	-0.412 ** (0.141)	-0.870 * (0.350)	0.107 (0.070)	0.000 (0.003)	0.043 (0.053)
	high	-0.569 (0.360)	-0.297 ** (0.095)	-0.040 (0.298)	0.110 (0.086)	-0.001 (0.006)	0.007 (0.044)
Primary and related production	low	-0.452 ° (0.236)	-0.497 *** (0.131)	-0.539 (0.356)	0.253 * (0.121)	-0.001 (0.011)	0.049 (0.062)
	high	-0.043 (0.381)	-0.212 (0.145)	-0.371 (0.294)	-0.036 (0.080)	0.000 (0.002)	0.000 (0.041)
Large scale production	low	-0.214 (0.280)	-0.302 ** (0.116)	-0.385 (0.301)	0.126 (0.080)	0.000 (0.002)	0.067 (0.066)
	high	-0.282 (0.299)	-0.407 *** (0.116)	-0.525 (0.320)	0.091 (0.073)	-0.001 (0.007)	-0.018 (0.045)
Trade services and food	low	-0.069 (0.328)	-0.374 * (0.147)	-0.661 ° (0.355)	0.102 (0.081)	0.000 (0.002)	0.041 (0.057)
	high	-0.426 (0.303)	-0.336 ** (0.104)	-0.249 (0.295)	0.115 (0.079)	-0.001 (0.006)	0.008 (0.042)
Recreation service	low	-0.509 (0.336)	-0.427 ** (0.138)	-0.348 (0.296)	0.080 (0.075)	0.000 (0.002)	0.029 (0.047)
	high	0.014 (0.362)	-0.282 * (0.122)	-0.562 * (0.272)	0.137 (0.096)	-0.001 (0.006)	0.021 (0.038)
Knowledge intensive production	low	-0.417 (0.273)	-0.499 *** (0.139)	-0.575 ° (0.339)	0.152 ° (0.086)	-0.001 (0.006)	0.031 (0.051)
	high	-0.078 (0.271)	-0.210 * (0.106)	-0.335 (0.336)	0.065 (0.063)	0.000 (0.002)	0.018 (0.050)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

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Annex 2

Supplements Chapter 5

List of Tables in ANNEX 2

Table A9: GDP medium location

		GDP Medium			
		Professional service	Trade service and food	Recreation service	Knowledge intensive production
Interaction with	Level	direct	direct	direct	direct
None		1.846 ** (0.657)	-3.114 *** (0.468)	-1.723 ** (0.647)	1.608 ** (0.491)
Professional service	low		-2.565 *** (0.719)	-1.070 (0.878)	-0.451 (0.748)
	high		-3.663 *** (0.832)	-2.376 ° (1.237)	3.666 *** (0.986)
Simple production	low	2.521 ** (0.915)	-2.993 *** (0.676)	-1.729 ° (0.887)	2.578 *** (0.761)
	high	1.171 (0.904)	-3.235 *** (0.584)	-1.717 * (0.829)	0.637 (0.647)
Primary and related production	low	2.904 *** (0.787)	-4.221 *** (0.647)	-1.293 (0.933)	2.160 ** (0.742)
	high	0.788 (1.071)	-2.007 ** (0.711)	-2.153 * (1.017)	1.055 (0.999)
Large scale production	low	2.121 * (0.897)	-2.528 *** (0.583)	-0.794 (0.862)	1.330 * (0.641)
	high	1.572 (1.030)	-3.700 *** (0.615)	-2.652 ** (0.908)	1.885 ** (0.609)
Trade services and food	low	2.375 ** (0.900)		-1.544 (1.011)	2.158 ** (0.672)
	high	1.317 (0.878)		-1.902 ** (0.673)	1.058 ° (0.639)
Recreation service	low	2.495 * (1.060)	-2.929 *** (0.736)		1.776 * (0.845)
	high	1.198 (1.088)	-3.299 *** (0.757)		1.439 * (0.658)
Knowledge intensive production	low	-0.145 (0.985)	-2.562 *** (0.608)	-1.558 (0.971)	
	high	3.838 *** (0.936)	-3.666 *** (0.669)	-1.888 ** (0.726)	
Health service	low	-0.585 (0.830)	-1.921 ** (0.596)	-1.952 * (0.864)	2.584 *** (0.565)
	high	4.278 *** (0.906)	-4.307 *** (0.691)	-1.494 * (0.710)	0.631 (0.700)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A10: Joblessness medium location

		Joblessness Medium									
		Profes-sional service	Simple production	Primary and related production	Large scale production	Trade service and food		Recreation service	Knowledge intensive production		Health service
Interaction with	Level	via GDP	direct	direct	direct	direct	via GDP	direct	direct	via GDP	direct
None		-0.232 * (0.094)	-2.115 *** (0.222)	-0.610 * (0.251)	0.400 * (0.184)	-0.709 *** (0.209)	0.392 *** (0.097)	-0.973 *** (0.277)	-0.541 * (0.210)	-0.202 ** (0.073)	0.790 *** (0.190)
Professional service	low		-2.262 *** (0.299)	-0.797 ** (0.279)	-0.326 (0.300)	-0.277 (0.309)	0.322 ** (0.110)	-0.779 * (0.372)	-0.738 * (0.317)	0.057 (0.095)	0.716 ** (0.245)
	high		-1.967 *** (0.391)	-0.422 (0.461)	1.127 ** (0.409)	-1.141 ** (0.360)	0.461 *** (0.138)	-1.166 * (0.525)	-0.343 (0.424)	-0.461 ** (0.154)	0.863 * (0.387)
Simple production	low	-0.317 * (0.131)		-0.605 (0.414)	0.911 ** (0.287)	-0.500 ° (0.293)	0.376 *** (0.113)	-0.651 ° (0.384)	-0.606 ° (0.326)	-0.324 ** (0.115)	0.918 ** (0.300)
	high	-0.147 (0.117)		-0.614 * (0.292)	-0.110 (0.205)	-0.918 *** (0.257)	0.407 *** (0.109)	-1.294 *** (0.353)	-0.476 ° (0.274)	-0.080 (0.083)	0.661 *** (0.200)
Primary and related production	low	-0.365 ** (0.122)	-2.111 *** (0.286)		-0.010 (0.271)	-0.801 ** (0.289)	0.531 *** (0.132)	-0.867 * (0.397)	-0.853 ** (0.317)	-0.272 * (0.107)	1.107 *** (0.269)
	high	-0.099 (0.136)	-2.119 *** (0.384)		0.810 ** (0.246)	-0.617 * (0.303)	0.252 * (0.102)	-1.079 * (0.432)	-0.228 (0.422)	-0.133 (0.128)	0.473 (0.318)
Large scale production	low	-0.267 * (0.124)	-1.603 *** (0.269)	-1.023 ** (0.315)		-0.129 (0.253)	0.318 ** (0.096)	-1.194 ** (0.364)	-0.504 ° (0.273)	-0.167 ° (0.087)	0.672 ** (0.249)
	high	-0.198 (0.135)	-2.627 *** (0.288)	-0.196 (0.306)		-1.289 *** (0.272)	0.465 *** (0.120)	-0.752 ° (0.392)	-0.577 * (0.261)	-0.237 ** (0.090)	0.907 *** (0.240)
Trade services and food	low	-0.299 * (0.128)	-1.913 *** (0.291)	-0.699 * (0.355)	0.959 *** (0.265)			-1.040 * (0.431)	-0.386 (0.288)	-0.271 ** (0.100)	0.832 ** (0.316)
	high	-0.166 (0.115)	-2.317 *** (0.273)	-0.520 ° (0.288)	-0.159 (0.211)			-0.906 ** (0.287)	-0.695 * (0.271)	-0.133 (0.084)	0.747 *** (0.219)
Recreation service	low	-0.314 * (0.147)	-1.794 *** (0.314)	-0.504 (0.375)	0.180 (0.288)	-0.778 * (0.318)	0.368 ** (0.118)		-0.461 (0.359)	-0.223 ° (0.115)	0.951 ** (0.291)
	high	-0.151 (0.140)	-2.436 *** (0.344)	-0.716 ° (0.420)	0.620 ° (0.342)	-0.640 ° (0.330)	0.415 *** (0.125)		-0.620 * (0.279)	-0.181 * (0.090)	0.629 * (0.264)
Knowledge intensive production	low	0.018 (0.124)	-2.178 *** (0.308)	-0.915 * (0.364)	0.435 ° (0.249)	-0.554 * (0.264)	0.322 ** (0.099)	-0.895 * (0.412)			1.111 *** (0.289)
	high	-0.483 ** (0.151)	-2.052 *** (0.303)	-0.305 (0.418)	0.365 (0.239)	-0.864 ** (0.294)	0.461 *** (0.124)	-1.050 *** (0.310)			0.469 * (0.232)
Health service	low	0.074 (0.105)	-1.994 *** (0.276)	-0.310 (0.324)	0.290 (0.212)	-0.668 ** (0.256)	0.242 ** (0.089)	-0.821 * (0.369)	-0.230 (0.247)	-0.325 *** (0.096)	
	high	-0.538 *** (0.155)	-2.236 *** (0.272)	-0.909 ** (0.334)	0.510 * (0.255)	-0.750 * (0.306)	0.542 *** (0.137)	-1.124 *** (0.302)	-0.852 ** (0.298)	-0.079 (0.089)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A11: Wage medium location

		Wage Medium							
		Professional service	Simple production	Primary and related production	Large scale production	Trade service and food	Recreation service	Knowledge intensive production	Health service
Interaction with	Level	direct	direct	direct	direct	direct	direct	direct	direct
None		37.553 * (15.220)	34.115 * (13.475)	-31.664 * (13.665)	44.126 *** (10.001)	-84.234 *** (11.435)	-56.094 *** (15.192)	67.961 *** (11.436)	-20.122 ° (10.502)
Professional service	low		-22.451 (17.323)	-48.754 ** (15.256)	54.247 *** (16.353)	-76.278 *** (16.692)	-74.146 *** (20.178)	61.683 *** (17.177)	-28.028 * (13.338)
	high		90.681 *** (21.925)	-14.574 (24.899)	34.005 (22.311)	-92.189 *** (19.698)	-38.042 (28.504)	74.239 ** (22.883)	-12.215 (21.086)
Simple production	low	-18.749 (21.083)		-26.574 (22.507)	46.815 ** (15.725)	-58.675 *** (15.840)	-49.629 * (20.778)	67.453 *** (17.647)	-11.993 (16.520)
	high	93.854 *** (20.798)		-36.754 * (15.846)	41.437 *** (11.040)	-109.792 *** (14.099)	-62.560 ** (19.360)	68.469 *** (14.832)	-28.250 ** (10.906)
Primary and related production	low	20.619 (18.317)	39.182 * (16.505)		57.601 *** (14.630)	-73.226 *** (15.739)	-66.230 ** (21.887)	81.484 *** (17.225)	-50.472 *** (14.811)
	high	54.486 * (24.460)	29.048 (21.714)		30.651 * (13.448)	-95.242 *** (16.425)	-45.958 ° (23.513)	54.438 * (22.821)	10.229 (17.247)
Large scale production	low	47.662 * (21.223)	36.814 * (15.425)	-18.080 (17.247)		-82.014 *** (13.648)	5.102 (19.918)	50.012 *** (14.795)	-6.866 (13.554)
	high	27.444 (24.017)	31.417 ° (17.192)	-45.248 ** (16.553)		-86.454 *** (15.083)	-117.290 *** (21.265)	85.910 *** (14.166)	-33.377 * (13.241)
Trade services and food	low	45.217 * (20.922)	58.854 *** (16.748)	-20.961 (19.281)	46.267 ** (14.536)		-46.311 * (23.417)	50.516 ** (15.578)	-11.215 (17.319)
	high	29.889 (20.038)	9.377 (16.092)	-42.367 ** (15.610)	41.985 *** (11.417)		-65.878 *** (15.752)	85.407 *** (14.741)	-29.028 * (11.998)
Recreation service	low	19.631 (24.339)	40.564 * (17.740)	-41.820 * (20.317)	104.950 *** (15.501)	-74.152 *** (17.273)		82.859 *** (19.394)	-10.397 (15.975)
	high	55.475 * (24.862)	27.666 (19.791)	-21.508 (23.092)	-16.698 (18.504)	-94.315 *** (17.856)		53.063 *** (15.149)	-29.846 * (14.365)
Knowledge intensive production	low	31.478 (22.447)	33.621 ° (17.715)	-18.457 (19.918)	26.738 * (13.491)	-101.756 *** (14.311)	-41.573 ° (22.383)		-29.699 ° (15.861)
	high	43.628 * (21.933)	34.609 * (17.447)	-44.871 * (22.514)	61.513 *** (12.896)	-66.711 *** (16.027)	-70.615 *** (16.953)		-10.545 (12.627)
Health service	low	30.143 (18.919)	41.769 ** (16.131)	-60.371 *** (17.533)	56.563 *** (11.439)	-75.570 *** (13.935)	-46.915 * (20.031)	58.686 *** (13.292)	
	high	44.963 * (21.411)	26.461 ° (15.962)	-2.957 (18.196)	31.688 * (13.823)	-92.898 *** (16.694)	-65.274 *** (16.585)	77.237 *** (16.234)	

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A12: Household income medium location

		Household income Medium								
		Professional service	Simple production		Primary and related production		Large scale production		Health service	
Interaction with	Level	direct	direct	via joblessness	direct	via joblessness	direct	via joblessness	direct	via joblessness
None		48.548 *** (14.208)	49.080 *** (12.496)	26.639 *** (6.158)	-7.041 (12.760)	7.679 * (3.530)	-25.216 ** (9.460)	-5.041 * (2.544)	-26.483 ** (9.731)	-9.947 ** (3.147)
Professional service	low		21.398 (15.968)	28.497 *** (6.970)	-37.721 ** (14.240)	10.036 * (4.079)	-11.114 (15.428)	4.107 (3.869)	-10.421 (12.348)	-9.023 * (3.600)
	high		76.762 *** (20.624)	24.781 *** (7.093)	23.639 (23.257)	5.321 (5.911)	-39.318 ° (20.597)	-14.190 * (5.923)	-42.545 * (19.419)	-10.871 * (5.367)
Simple production	low	20.996 (19.447)			39.962 ° (20.735)	7.625 (5.448)	-15.154 (14.631)	-11.469 ** (4.318)	-33.821 * (15.275)	-11.569 ** (4.472)
	high	76.101 *** (19.751)			-54.044 *** (14.960)	7.733 ° (4.013)	-35.278 *** (10.424)	1.387 (2.594)	-19.146 ° (10.118)	-8.326 ** (3.042)
Primary and related production	low	18.150 (16.885)	95.871 *** (15.343)	26.585 *** (6.552)			-36.204 ** (13.783)	0.126 (3.420)	-48.073 *** (13.868)	-13.940 ** (4.437)
	high	78.947 *** (23.000)	2.289 (20.052)	26.693 *** (7.321)			-14.227 (12.452)	-10.208 ** (3.745)	-4.893 (15.871)	-5.955 (4.192)
Large scale production	low	62.635 ** (19.646)	59.178 *** (14.304)	20.188 *** (5.364)	-18.119 (15.921)	12.888 ** (4.773)			-19.209 (12.499)	-8.470 * (3.585)
	high	34.462 (22.360)	38.982 * (15.890)	33.090 *** (7.719)	4.036 (15.522)	2.470 (3.889)			-33.758 ** (12.291)	-11.424 ** (3.834)
Trade services and food	low	54.626 ** (19.433)	46.014 ** (15.669)	24.096 *** (6.166)	4.483 (17.935)	8.804 ° (4.822)	-23.446 ° (13.572)	-12.083 ** (4.166)	-27.350 ° (15.969)	-10.481 * (4.530)
	high	42.471 * (18.552)	52.146 *** (14.818)	29.183 *** (6.921)	-18.565 (14.514)	6.554 ° (3.872)	-26.986 * (10.703)	2.000 (2.692)	-25.617 * (11.125)	-9.413 ** (3.375)
Recreation service	low	66.214 ** (22.434)	39.328 * (16.505)	22.598 *** (6.104)	16.149 (18.787)	6.343 (4.901)	-22.686 (15.116)	-2.272 (3.653)	-51.43 *** (14.701)	-11.972 ** (4.422)
	high	30.883 (23.474)	58.832 ** (18.316)	30.680 *** (7.658)	-30.232 (21.517)	9.015 (5.603)	-27.746 (17.122)	-7.811 ° (4.595)	-1.536 (13.329)	-7.922 * (3.708)
Knowledge intensive production	low	18.116 (20.785)	66.900 *** (16.390)	27.437 *** (6.850)	-11.684 (18.408)	11.522 * (5.162)	-55.339 *** (12.548)	-5.484 (3.332)	-51.923 *** (14.679)	-13.991 ** (4.639)
	high	78.981 *** (20.322)	31.259 ° (16.150)	25.842 *** (6.551)	-2.398 (20.874)	3.836 (5.321)	4.907 (12.217)	-4.598 (3.152)	-1.044 (11.635)	-5.904 ° (3.159)
Health service	low	63.602 *** (17.555)	42.171 ** (14.984)	25.112 *** (6.231)	-27.462 ° (16.434)	3.903 (4.156)	-18.391 ° (10.894)	-3.656 (2.772)		
	high	33.495 ° (19.858)	55.989 *** (14.749)	28.166 *** (6.737)	13.380 (16.839)	11.455 * (4.824)	-32.041 * (12.810)	-6.427 ° (3.475)		

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A12: Household income medium location – Continued 1

		Household income: Medium							
		Trade service and food			Recreation service	Knowledge intensive production			
Interaction with	Level	direct	via joblessness	via GDP and joblessness	via joblessness	direct	via GDP	via joblessness	via GDP and joblessness
None		-11.773 * (5.007)	8.929 ** (3.211)	-4.932 ** (1.588)	12.252 ** (4.303)	27.971 * (11.112)	6.078 * (3.049)	6.810 * (2.996)	2.546 * (1.063)
Professional service	low	-9.696 * (4.720)	3.492 (3.963)	-4.062 * (1.623)	9.816 ° (5.106)	-3.479 (16.115)	-1.703 (2.907)	9.297 * (4.423)	-0.714 (1.201)
	high	-13.850 * (6.346)	14.367 ** (5.417)	-5.802 ** (2.114)	14.688 * (7.271)	59.422 ** (21.413)	13.859 * (6.656)	4.322 (5.416)	5.806 * (2.274)
Simple production	low	-11.315 * (5.176)	6.302 (3.910)	-4.740 ** (1.723)	8.201 (5.117)	46.302 ** (16.721)	9.747 * (4.829)	7.630 ° (4.398)	4.083 * (1.675)
	high	-12.231 * (5.345)	11.557 ** (4.014)	-5.124 ** (1.728)	16.303 ** (5.568)	9.641 (14.039)	2.409 (2.628)	5.989 (3.662)	1.009 (1.064)
Primary and related production	low	-15.959 * (6.805)	10.086 * (4.191)	-6.685 ** (2.162)	10.919 * (5.479)	23.217 (16.380)	8.167 ° (4.292)	10.745 * (4.560)	3.421 * (1.526)
	high	-7.587 ° (4.042)	7.772 ° (4.142)	-3.178 * (1.445)	13.585 * (6.114)	32.725 (21.199)	3.989 (4.099)	2.874 (5.353)	1.671 (1.653)
Large scale production	low	-9.558 * (4.395)	1.629 (3.204)	-4.004 ** (1.467)	15.038 ** (5.536)	-3.124 (13.994)	5.028 (3.143)	6.352 ° (3.676)	2.106 ° (1.180)
	high	-13.988 * (6.032)	16.230 *** (4.785)	-5.860 ** (1.932)	9.466 ◦ (5.307)	59.066 *** (13.682)	7.128 ° (3.653)	7.267 * (3.616)	2.986 * (1.286)
Trade services and food	low				13.095 * (6.065)	14.375 (14.611)	8.157 * (4.122)	4.861 (3.762)	3.417 * (1.442)
	high				11.409 ** (4.310)	41.567 ** (14.233)	3.999 (2.891)	8.758 * (3.864)	1.675 (1.118)
Recreation service	low	-11.075 * (5.211)	9.798 * (4.482)	-4.639 ** (1.762)		-6.869 (18.345)	6.716 (4.166)	5.808 (4.674)	2.813 ° (1.560)
	high	-12.471 * (5.729)	8.061 ° (4.473)	-5.224 ** (1.911)		62.812 *** (14.224)	5.440 (3.298)	7.812 * (3.870)	2.279 ° (1.228)
Knowledge intensive production	low	-9.685 * (4.488)	6.972 ° (3.623)	-4.057 ** (1.504)	11.275 * (5.684)				
	high	-13.861 * (6.068)	10.886 * (4.328)	-5.807 ** (1.964)	13.229 ** (4.758)				
Health service	low	-7.263 * (3.664)	8.410 * (3.659)	-3.043 * (1.281)	10.340 * (5.107)	3.332 (12.651)	9.768 * (4.434)	2.894 (3.162)	4.092 ** (1.469)
	high	-16.283 * (6.985)	9.449 * (4.323)	-6.821 ** (2.230)	14.164 ** (4.792)	52.610 *** (15.439)	2.387 (2.811)	10.726 * (4.350)	1.000 (1.144)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A13: Tax medium location

Interaction with	Level	Tax Medium: Professional service				Simple production		Large scale production		Health service	
		direct	via wages	via GDP	via household income	via joblessness	via household income	direct	via wages	direct	via joblessness
None		30.211 **	6.469 *	15.430 **	6.915 *	22.936 ***	6.991 **	-21.843 **	7.601 **	-14.259 *	-8.565 ***
		(10.509)	(2.963)	(5.854)	(2.801)	(4.744)	(2.645)	(6.995)	(2.366)	(7.099)	(2.561)
Professional service	low					24.536 ***	3.048	1.326	9.345 **	-35.071 ***	-7.769 **
						(5.441)	(2.429)	(11.159)	(3.451)	(9.028)	(2.994)
	high					21.337 ***	10.933 *	-45.011 **	5.858	6.553	-9.360 *
						(5.696)	(4.243)	(15.067)	(4.041)	(14.163)	(4.519)
Simple production	low	2.536	-3.230	21.071 **	2.991			-15.322	8.065 *	7.821	-9.961 **
		(14.073)	(3.697)	(8.132)	(2.894)			(10.725)	(3.209)	(11.112)	(3.710)
	high	57.887 ***	16.168 **	9.789	10.839 **			-28.363 ***	7.138 **	-36.340 ***	-7.168 **
		(14.728)	(4.972)	(7.661)	(4.138)			(7.667)	(2.436)	(7.345)	(2.513)
Primary and related production	low	15.443	3.552	24.273 ***	2.585	22.890 ***	13.655 **	-19.174 °	9.923 **	-15.158	-12.002 ***
		(12.316)	(3.245)	(7.309)	(2.512)	(5.123)	(4.404)	(10.083)	(3.291)	(10.238)	(3.614)
	high	44.980 **	9.386 *	6.587	11.245 *	22.983 ***	0.326	-24.512 **	5.280 *	-13.360	-5.127
		(16.911)	(4.665)	(8.992)	(4.543)	(5.840)	(2.858)	(9.130)	(2.576)	(11.501)	(3.570)
Large scale production	low	53.354 ***	8.211 *	17.722 *	8.921 *	17.382 ***	8.429 **			-10.825	-7.293 *
		(14.529)	(4.054)	(7.846)	(3.751)	(4.256)	(3.118)			(9.057)	(2.994)
	high	7.069	4.728	13.138	4.909	28.491 ***	5.552 *			-17.693 *	-9.836 **
		(16.213)	(4.258)	(8.778)	(3.469)	(5.960)	(2.746)			(8.975)	(3.141)
Trade services and food	low	32.592 *	7.789 *	19.853 *	7.780 *	20.747 ***	6.554 *	-26.887 **	7.970 **	-5.288	-9.024 *
		(14.295)	(3.969)	(7.959)	(3.522)	(4.858)	(2.889)	(9.978)	(3.027)	(11.588)	(3.788)
	high	27.831 *	5.149	11.007	6.049 °	25.126 ***	7.427 *	-16.799 *	7.233 **	-23.230 **	-8.105 **
		(13.524)	(3.622)	(7.478)	(3.139)	(5.365)	(2.963)	(7.827)	(2.499)	(8.097)	(2.783)
Recreation service	low	-6.897	3.382	20.852 *	9.431 *	19.457 ***	5.602 *	-32.014 **	18.079 ***	0.351	-10.308 **
		(16.486)	(4.254)	(9.270)	(4.145)	(4.857)	(2.826)	(10.967)	(4.690)	(10.803)	(3.656)
	high	67.320 ***	9.556 *	10.008	4.399	26.416 ***	8.380 *	-11.672	-2.877	-28.869 **	-6.821 *
		(17.019)	(4.743)	(9.186)	(3.563)	(6.003)	(3.509)	(12.529)	(3.246)	(9.651)	(3.114)
Knowledge intensive production	low	14.726	5.423	-1.214	2.580	23.623 ***	9.529 **	-9.138	4.606 °	-1.485	-12.046 **
		(15.027)	(4.036)	(8.233)	(3.047)	(5.370)	(3.545)	(9.361)	(2.523)	(10.786)	(3.795)
	high	45.697 **	7.516 °	32.074 ***	11.250 **	22.250 ***	4.452 °	-34.548 ***	10.597 ***	-27.033 **	-5.083 °
		(15.229)	(4.104)	(8.880)	(4.278)	(5.151)	(2.616)	(8.913)	(3.169)	(8.405)	(2.669)
Health service	low	10.707	5.193	-4.893	9.059 *	21.622 ***	6.007 *	-18.621 *	9.744 ***		
		(12.903)	(3.442)	(6.966)	(3.562)	(4.878)	(2.717)	(7.951)	(2.864)		
	high	49.716 ***	7.746 °	35.753 ***	4.771	24.251 ***	7.975 **	-25.065 **	5.459 *		
		(14.616)	(4.041)	(8.904)	(3.128)	(5.233)	(3.066)	(9.437)	(2.651)		

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A13: Tax medium location – Continued 1

		Tax Medium										
		Trade service and food					Recreation service		Knowledge intense production			
Interaction with	Level	via GDP	via joblessness	via GDP and joblessness	via wages	via GDP and wages	via joblessness	via wages	direct	via GDP	via wages	via GDP and wages
None		-26.024 *** (5.189)	7.688 ** (2.649)	-4.246 ** (1.295)	-14.511 *** (3.668)	-7.281 *** (2.038)	10.549 ** (3.541)	-9.663 ** (3.331)	27.954 *** (8.147)	13.435 ** (4.466)	11.707 *** (3.180)	3.759 ** (1.452)
Professional service	low	-21.433 ** (6.635)	3.006 (3.398)	-3.497 ** (1.350)	-13.140 ** (4.015)	-5.996 ** (2.199)	8.452 * (4.309)	-12.773 ** (4.416)	11.951 (11.652)	-3.765 (6.267)	10.626 ** (3.727)	-1.053 (1.766)
	high	-30.615 *** (8.031)	12.370 ** (4.486)	-4.995 ** (1.745)	-15.881 *** (4.794)	-8.565 ** (2.807)	12.646 * (6.122)	-6.553 (5.105)	43.957 ** (15.809)	30.636 *** (9.166)	12.789 ** (4.793)	8.571 ** (3.068)
Simple production	low	-25.011 *** (6.529)	5.426 (3.319)	-4.081 ** (1.422)	-10.108 ** (3.477)	-6.997 ** (2.286)	7.061 (4.345)	-8.549 * (4.017)	45.632 *** (12.327)	21.546 ** (6.958)	11.620 ** (3.922)	6.028 ** (2.279)
	high	-27.038 *** (6.035)	9.951 ** (3.300)	-4.412 ** (1.417)	-18.914 *** (4.708)	-7.564 *** (2.250)	14.037 ** (4.570)	-10.777 ** (4.050)	10.275 (10.146)	5.325 (5.453)	11.795 ** (3.585)	1.490 (1.553)
Primary and related production	low	-35.278 *** (7.117)	8.684 * (3.495)	-5.756 ** (1.764)	-12.614 *** (3.819)	-9.869 *** (2.780)	9.401 * (4.616)	-11.409 * (4.487)	43.770 *** (11.864)	18.053 ** (6.636)	14.037 *** (4.215)	5.051 * (2.105)
	high	-16.770 ** (6.337)	6.692 ° (3.498)	-2.736 * (1.212)	-16.407 *** (4.500)	-4.692 * (1.998)	11.697 * (5.123)	-7.917 ° (4.388)	12.137 (15.449)	8.817 (8.433)	9.378 * (4.411)	2.467 (2.408)
Large scale production	low	-21.129 *** (5.603)	1.402 (2.755)	-3.447 ** (1.212)	-14.128 *** (3.822)	-5.911 ** (1.951)	12.948 ** (4.575)	0.879 (3.436)	41.069 *** (10.158)	11.115 * (5.554)	8.615 ** (3.142)	3.109 ° (1.670)
	high	-30.920 *** (6.545)	13.974 *** (3.859)	-5.045 ** (1.580)	-14.893 *** (4.104)	-8.650 *** (2.499)	8.150 ° (4.491)	-20.205 *** (5.656)	14.839 (10.163)	15.756 ** (5.494)	14.799 *** (3.990)	4.408 * (1.764)
Trade services and food	low						11.275 * (5.091)	-7.978 ° (4.378)	38.896 *** (10.568)	18.031 ** (6.094)	8.702 ** (3.263)	5.044 * (1.972)
	high						9.823 ** (3.569)	-11.349 ** (3.636)	17.011 (10.531)	8.839 (5.461)	14.713 *** (4.036)	2.473 (1.603)
Recreation service	low	-24.482 *** (6.937)	8.436 * (3.759)	-3.995 ** (1.460)	-12.774 ** (4.034)	-6.849 ** (2.362)			18.097 (13.375)	14.846 * (7.327)	14.274 ** (4.520)	4.153 ° (2.206)
	high	-27.567 *** (7.290)	6.940 ° (3.784)	-4.498 ** (1.579)	-16.247 *** (4.633)	-7.712 ** (2.541)			37.811 *** (10.541)	12.024 * (5.721)	9.141 ** (3.257)	3.364 ° (1.732)
Knowledge intensive production	low	-21.408 *** (5.807)	6.003 * (3.058)	-3.493 ** (1.244)	-17.529 *** (4.478)	-5.989 ** (2.006)	9.708 * (4.791)	-7.162 ° (4.147)				
	high	-30.641 *** (6.888)	9.373 ** (3.598)	-4.999 ** (1.611)	-11.492 ** (3.692)	-8.572 *** (2.560)	11.390 ** (3.925)	-12.165 ** (3.906)				
Health service	low	-16.055 ** (5.405)	7.241 * (3.061)	-2.620 * (1.069)	-13.018 *** (3.670)	-4.492 * (1.751)	8.903 * (4.300)	-8.082 * (3.857)	40.325 *** (9.162)	21.593 *** (5.503)	10.110 ** (3.145)	6.041 ** (1.944)
	high	-35.994 *** (7.457)	8.135 * (3.626)	-5.873 ** (1.821)	-16.003 *** (4.463)	-10.070 *** (2.876)	12.195 ** (3.930)	-11.245 ** (3.730)	15.582 (11.387)	5.278 (5.890)	13.305 *** (3.984)	1.476 (1.673)

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Table A14: Population development medium location

Interaction with	Level	Professional service	Simple production		Primary and related production		Trade service and food			Recreation service		Knowledge intense production		Health service	
		Population development: Medium													
		direct	direct	via joblessness	direct	via joblessness	direct	via joblessness	via GDP and joblessness	direct	via joblessness	via joblessness	via GDP and joblessness	direct	via joblessness
None		0.668 ** (0.239)	-0.689 ** (0.212)	0.950 *** (0.139)	-0.823 *** (0.209)	0.274 * (0.116)	0.705 *** (0.186)	0.318 ** (0.099)	-0.176 *** (0.047)	0.470 * (0.233)	0.437 *** (0.132)	0.243 * (0.098)	0.091 ** (0.034)	-0.444 ** (0.161)	-0.355 *** (0.093)
Professional service	low		-0.388 (0.265)	1.016 *** (0.170)	-1.074 *** (0.237)	0.358 ** (0.131)	0.577 * (0.260)	0.124 (0.139)	-0.145 ** (0.052)	0.911 ** (0.317)	0.350 * (0.171)	0.331 * (0.146)	-0.025 (0.043)	-0.628 ** (0.208)	-0.322 ** (0.115)
	high		-0.991 ** (0.350)	0.883 *** (0.198)	-0.573 (0.379)	0.190 (0.208)	0.833 ** (0.304)	0.512 ** (0.170)	-0.207 ** (0.066)	0.029 (0.434)	0.524 * (0.242)	0.154 (0.191)	0.207 ** (0.072)	-0.260 (0.319)	-0.388 * (0.178)
Simple production	low	0.968 ** (0.318)			-1.043 ** (0.342)	0.272 (0.188)	0.651 ** (0.246)	0.225 ° (0.133)	-0.169 ** (0.053)	0.781 * (0.316)	0.292 ° (0.175)	0.272 ° (0.149)	0.146 ** (0.054)	-0.431 ° (0.251)	-0.412 ** (0.141)
	high	0.368 (0.340)			-0.604 * (0.248)	0.276 * (0.134)	0.759 *** (0.228)	0.412 *** (0.123)	-0.183 *** (0.052)	0.159 (0.296)	0.581 *** (0.169)	0.213 ° (0.125)	0.036 (0.037)	-0.457 ** (0.172)	-0.297 ** (0.095)
Primary and related production	low	0.420 (0.278)	-0.908 *** (0.267)	0.948 *** (0.161)			0.582 * (0.247)	0.360 ** (0.135)	-0.238 *** (0.064)	0.782 * (0.335)	0.389 * (0.183)	0.383 ** (0.147)	0.122 * (0.050)	-0.477 * (0.231)	-0.497 *** (0.131)
	high	0.916 * (0.384)	-0.471 (0.329)	0.951 *** (0.198)			0.828 ** (0.257)	0.277 * (0.139)	-0.113 * (0.047)	0.158 (0.356)	0.484 * (0.200)	0.102 (0.190)	0.060 (0.058)	-0.411 (0.259)	-0.212 (0.145)
Large scale production	low	0.506 (0.333)	-0.863 *** (0.243)	0.720 *** (0.142)	-0.875 *** (0.262)	0.459 ** (0.149)	0.668 ** (0.216)	0.058 (0.114)	-0.143 ** (0.046)	0.397 (0.304)	0.536 ** (0.173)	0.226 ° (0.125)	0.075 ° (0.040)	-0.377 ° (0.205)	-0.302 ** (0.116)
	high	0.830 * (0.365)	-0.516 ° (0.270)	1.180 *** (0.177)	-0.772 ** (0.253)	0.088 (0.138)	0.741 ** (0.240)	0.579 *** (0.136)	-0.209 *** (0.058)	0.543 (0.332)	0.337 ° (0.179)	0.259 * (0.120)	0.106 * (0.042)	-0.511 * (0.204)	-0.407 *** (0.116)
Trade services and food	low	0.545 ° (0.324)	-0.742 ** (0.261)	0.859 *** (0.157)	-0.943 ** (0.294)	0.314 ° (0.162)				0.609 ° (0.357)	0.467 * (0.199)	0.173 (0.130)	0.122 ** (0.047)	-0.327 (0.261)	-0.374 * (0.147)
	high	0.791 ** (0.306)	-0.637 * (0.249)	1.040 *** (0.162)	-0.704 ** (0.237)	0.234 ° (0.132)				0.331 (0.243)	0.407 ** (0.135)	0.312 * (0.126)	0.060 (0.038)	-0.561 ** (0.184)	-0.336 ** (0.104)
Recreation service	low	1.106 ** (0.371)	-0.379 (0.273)	0.806 *** (0.163)	-0.511 ° (0.306)	0.226 (0.170)	0.848 ** (0.270)	0.349 * (0.147)	-0.165 ** (0.055)			0.207 (0.162)	0.100 ° (0.053)	-0.471 ° (0.243)	-0.427 ** (0.138)
	high	0.230 (0.392)	-1.000 ** (0.306)	1.094 *** (0.191)	-1.136 ** (0.353)	0.321 ° (0.191)	0.562 * (0.280)	0.287 ° (0.151)	-0.186 ** (0.059)			0.278 * (0.129)	0.081 * (0.041)	-0.417 ° (0.220)	-0.282 * (0.122)
Knowledge intensive production	low	0.748 * (0.340)	-0.416 (0.280)	0.978 *** (0.171)	-0.683 * (0.302)	0.411 * (0.169)	0.857 *** (0.231)	0.249 * (0.121)	-0.145 ** (0.047)	0.498 (0.339)	0.402 * (0.189)			-0.515 * (0.243)	-0.499 *** (0.139)
	high	0.588 ° (0.348)	-0.963 *** (0.266)	0.921 *** (0.166)	-0.964 ** (0.341)	0.137 (0.188)	0.553 * (0.249)	0.388 ** (0.138)	-0.207 *** (0.059)	0.442 ° (0.265)	0.472 ** (0.147)			-0.373 ° (0.192)	-0.210 * (0.106)
Health service	low	0.496 ° (0.291)	-0.677 ** (0.250)	0.895 *** (0.154)	-0.855 ** (0.270)	0.139 (0.146)	0.819 *** (0.219)	0.300 * (0.119)	-0.108 ** (0.041)	0.444 (0.304)	0.369 * (0.170)	0.103 (0.111)	0.146 ** (0.045)		
	high	0.840 * (0.334)	-0.702 ** (0.251)	1.004 *** (0.160)	-0.792 ** (0.277)	0.408 ** (0.156)	0.591 * (0.263)	0.337 * (0.142)	-0.243 *** (0.067)	0.495 ° (0.258)	0.505 *** (0.145)	0.382 ** (0.139)	0.036 (0.040)		

Note: Standard errors in parentheses below coefficients. Significance levels in percent: °<10; *<5; **<1; ***<0.1.
Source: Own calculation.

Bibliografische Information:
Die Deutsche Nationalbibliothek verzeichnet diese Publikationen in der Deutschen National-bibliografie; detaillierte bibliografische Daten sind im Internet unter www.dnb.de abrufbar.

Bibliographic information:
The Deutsche Nationalbibliothek (German National Library) lists this publication in the German National Bibliographie; detailed bibliographic data is available on the Internet at www.dnb.de

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Zitationsvorschlag – *Suggested source citation:*
Margarian A (2013) Regional industrial structure, productivity, wealth and income distribution in German regions. Braunschweig: Johann Heinrich von Thünen-Institut, 205 p, Thünen Working Paper 1

THÜNEN

Thünen Working Paper 1

Herausgeber/Redaktionsanschrift – *Editor/address*
Johann Heinrich von Thünen-Institut
Bundesallee 50
38116 Braunschweig
Germany

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www.ti.bund.de

DOI:10.3220/WP_1_2013
urn:nbn:de:gbv:253-201304-dn051883-9