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580/2019

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AUSTRIAN INSTITUTE OF ECONOMIC RESEARCH

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WIFO Working Papers, No. 580

April 2019

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2019/086/W/0

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The economic impact of long-term care services*

Gerhard Streicher, Ulrike Famira-Mühlberger, Matthias Firgo

Abstract
Projections show sharp increases in public spending on long-term care (LTC) services across Europe. However, a purely cost based focus on LTC services is economically misleading. Private and public expenditure on LTC services directly and indirectly generate income in the form of salaries, taxes and social security contributions. The aim of this article is to quantify the economic impact and multipliers of LTC services for the first time. Based on an econometric regional Input-Output model for Austria, we estimate the direct, indirect and induced effects of public and private expenditures on value added, employment, taxes and social security contributions. According to our results, each Euro spent on LTC services is associated with domestic value added of 1.7 euros as well as 70 cents in taxes and social security contributions. The economic multipliers of the LTC services are comparatively high due to the high share of wages and salaries in direct expenditure and the associated high direct value added. Public expenditure on professional care services should therefore not be regarded merely as a cost factor in the public budget. Rather, this rapidly growing economic sector is also an increasingly important economic factor in a time of ageing societies.

Keywords: Long-term care services, input-output model, returns to public expenditures

JEL classification: H53, I19, J14

1. Introduction

Due to the demographic change in Europe, long-term care (LTC) is increasingly becoming the focus of political attention. International projections of the development of demand for long-term care show significant growth rates in the future (most recently EC 2018). This prospect has put the question of financing LTC on top of the political agenda of European governments (Fernández and Nadash, 2016). However, a one-sided view of expenditure on LTC services is too narrow, as the money spent flows back into the economic cycle. The flip-side of this expenditure is income for employees, turnover for suppliers, income for their employees and consumption expenditure from wages and profits, as well as taxes and social security contributions for public budget(s).

This article aims at providing a first quantification on the economic impact of LTC services and at estimating economic multipliers of these services through their economic interdependencies. We combine detailed data on the structure of expenditures of three major trans-regional providers of LTC services in Austria with an econometric input-output model that depicts the

* We thank Stefan Schiman for helpful comments and suggestions and Christoph Lorenz for excellent research assistance. The research reported herein was performed within the research program "Austria 2025" which was financially supported by Austrian Federal Ministry of Transport, Innovation and Technology, Austrian Federal Ministry of Science, Research and Economy, Austrian National Bank, Austrian Climate and Energy Fund, Austrian Federal Ministry of Labour, Social Affairs and Consumer Protection and the Hannes Androsch Foundation at the Austrian Academy of Sciences.

regional interdependencies of the Austrian economy to calculate the direct, indirect and induced effects of LTC services on value added and employment. Additionally, we calculate the taxes and social security contributions derived from these economic activities.

Results show that each euro invested in mobile home care and inpatient LTC services is associated with 1.7 Euros of value added. This results in tax revenues of 31% and social security contributions of 38% of the original expenditure. In other words, through direct, indirect and induced effects, almost 70% of public expenditure on LTC services returns to the fiscal authorities in the form of taxes and social security contributions. These returns are high compared to other industries which compete for public funds, following the high labour intensity of LTC services and the associated high first-round effects in value added and fiscal revenues. Nevertheless, our results do not imply that without existing expenditure on LTC services the national economy would be smaller as alternative spending would also generate direct, indirect and induced effects on the economy. Still, the "degree of self-financing" of professional LTC services is comparatively high.

2. The Austrian long-term care system

In Austria, people in need of long-term care are supported by the public sector through cash benefits (long-term care allowance) and benefits in kind (nursing homes, old people's homes, mobile services). In 1993 Austria introduced a uniform, demand-oriented (needs-tested) LTC allowance ("*Pflegegeld*"). There is a legal entitlement to this allowance - irrespective of income and assets (non means-tested) as well as the cause of the need for care. Depending on the intensity of the extent of care needed, the LTC allowance is divided into seven levels with a range from € 157 per month at LTC allowance level 1 to € 1,689 per month at level 7 (as of 2017). 50% of those receiving LTC allowance are assigned to the lower levels 1 and 2. In 2017, around 459,000 people received LTC allowance, or 5.2% of the Austrian population. Among those who are 65 years of age or older, 28.1% received LTC allowance in 2017 (BMASGK 2017). The social policy objective of the LTC allowance is to protect against the risk of becoming in need of care. The LTC allowance is financed by the general federal tax revenue (national budget). Since it is not linked to benefits in kind, the funds can be used either for informal care or for other transfers or private purposes. There is no obligation to provide evidence of the use of the funds.

If LTC allowance recipients receive LTC services (benefits in kind), the allowance is used to finance these services or the necessary co-payments. In the case of inpatient care, the LTC allowance is transferred directly from the funding source to the service provider. In 2017, 18% of those receiving LTC allowance used inpatient services (BMASGK 2017). The remaining 82% are cared for at home. 77% among the latter do not receive mobile LTC services (Kompetenzzentrum 2018). Family members - especially women - therefore provide most of the long-

term care in Austria and home care by relatives is the dominant LTC model in Austria (Nagl-Cupal et al. 2018).[2]

76% of total expenditures for LTC services are used for inpatient care and about 20% for mobile care. Other forms of LTC services (such as day-care centres, short-term care in inpatient facilities, alternative forms of housing) play a subordinate role in Austria (BMASGK 2017). LTC services are organised and paid for by the individual federal states or municipalities, with a large proportion of the costs being covered by intergovernmental transfers provided by the federal government (Grossmann and Schuster 2017). There are different LTC service provider structures in the individual the federal states due to state-specific regulations, including both public and private (profit-oriented and non-profit) providers of LTC services.

The level of professional mobile or inpatient LTC care in Austria is low by Western European standards. Corresponding OECD data (OECD Health Statistics 2018) indicate a population coverage rate of 1.9% for Austria, while countries such as Switzerland (2.4%), Germany (2.8%) or Sweden (2.9%) have a much higher coverage rate. Consistent with this is also the fact that total private and public expenditure on LTC in Austria - measured in terms of gross national product - is below average in a Western European comparison. With expenditures amounting to 1.5% of GDP, Austria is in the lower third of the comparable Western European countries.

Projections of future expenditure on LTC services in Austria point to a strong increase due to demographic change, but also due to the decline in informal care provided by relatives, and because of an expected real unit (labour) cost increase in the LTC service sector.[3] Between the base year 2016 and 2030, it is assumed that real expenditure on LTC services will increase by over 80%, and by 2050 by around 335% (Famira-Mühlberger - Firgo, 2018). A further expansion of professional mobile and inpatient LTC services is not only indispensable in view of the increasing ageing of the population but is also central to avoiding conflicts of economic policy objectives - especially regarding the labour force participation of women (Famira-Mühlberger - Firgo, 2018).

3. Methodology

Data on the expenditure and employment according to official LTC service statistics were complemented by data on the expenditure structures for LTC services provided by three trans-regionally operating LTC providers.[4] This allowed for the first time to estimate the overall economic effect of professional LTC care. We calculate the direct, indirect and induced effects

[2] According to a survey among carers, 73% of carers are women (Cf. Nagl-Cupal 2018).

[3] Care services are labour intensive; as such, they are prone to the so-called Baumol's Cost Disease (Baumol, 1966): Although labour intensive services experience only low productivity growth, their wages rise more in line with other, more productive sectors, making them increasingly expensive. Technology, maybe in the form of "care robots", could lessen this problem in the future

[4] I.e. Caritas, Diakonie, Volkshilfe. These three organisations are among the largest in Austria. Unfortunately, no data on the market shares of these organisations are available.

on gross value added and employment. In addition, the tax revenues and social security contributions associated with these effects are derived. This sheds light on the care sector beyond the usual focus on high and rising public spending (cf. Weissensteiner - Buxbaum, 2014).

The *direct* effects of LTC services, i.e. those that are incurred by the providers of these services themselves, can be derived from a detailed analysis of the cost structure of the service providers: They result in the direct contribution to (regional) gross value added (and gross domestic product) as well as to investment and employment. In the economic cycle, however, this is only the first step: Production linkages between the sectors mean that not only the directly commissioned companies, but also third-party companies - via supply chains - are *indirectly* connected with the LTC sector. In both stages, added value is generated - this consists of wages and salaries, capital depreciation and operating surpluses (profits). These *induce* additional effects in the economic cycle: income flows into private consumption, depreciation and profits trigger investment demand (both replacement and possibly expansion investments). In addition, taxes and social security contributions are payable at all levels: Taxes on goods and services (most important here is sales tax), income and wage taxes, corporate taxes and social security contributions.

ASCANIO, a regional economic model, is used to estimate these effects. ASCANIO maps the linkages between the economic sectors at the level of the Austrian federal states; the structural information is based on the Austrian Input-Output-Table (published by Statistik Austria) for the year 2011, which has been supplemented by behavioural equations based on economic theory. These behavioural equations describe

- private consumption (a function of income and prices);
- the factor demand for labour, capital and intermediate consumption (functions of wages, prices and output as well as - in the case of capital and the investments derived therefrom - the interest rate level), and
- price formation; from the central price variable, output prices, all other prices - considering transport and trade margins, taxes on goods, etc. - are derived in a consistent manner
- as well as a model for wage formation (formulated as depending on productivity, the unemployment rate and inflation).

The linkages between the sectors are mapped in the regional input-output tables, which record the flows of products between the sectors (when firms use output of other firms as intermediate inputs, think of an old people's home buying healthcare beds from a company specialised in healthcare supplies) or from sectors to final demand (when a firm produces consumption goods, like the healthcare beds). The origin of these goods used in either production or consumption - from the home region, from other model regions or from the "rest of the world" - will be determined by the trade model implemented in the model, unless more detailed information is available (if, for example, it is known that a specific good is sourced from a certain region, then the trade model is "overruled"). For the base year, this model trade matrix is

derived from statistical sources and company surveys. However, price reactions in the model can also change the structure of these trade flows.

ASCANIO is part of a model family that is implemented at different geographical levels.[5] What these models have in common is a theoretical core that is supplemented by detailed statistical information at the respective regional level.[6] The structure of this model family follows a scheme as shown in Figure 1.

ASCANIO, as a model implemented at the level of federal states ("Bundesländer"), has some special mechanisms that can be described as "regional redistribution processes":

- *Commuter linkages*: For example, about 250,000 people employed in Vienna live in other federal states. Conversely, about 80,000 Viennese residents commute to places of work outside their region of residence. This results in a redistribution of available income from the working region (where the income is generated) to the residential region (where the resulting consumption is assumed to be primarily made).
- *Domestic tourism*: Like commuter networks, tourism causes a redistribution from the place of residence to the holiday region. If the holiday region is also in Austria, this implies a transfer of consumer spending within Austria.[7]
- *Interregional shopping:* A systematic - and not inconsiderable - regional dispersion of consumer spending results from shopping centres in different regions.[8]

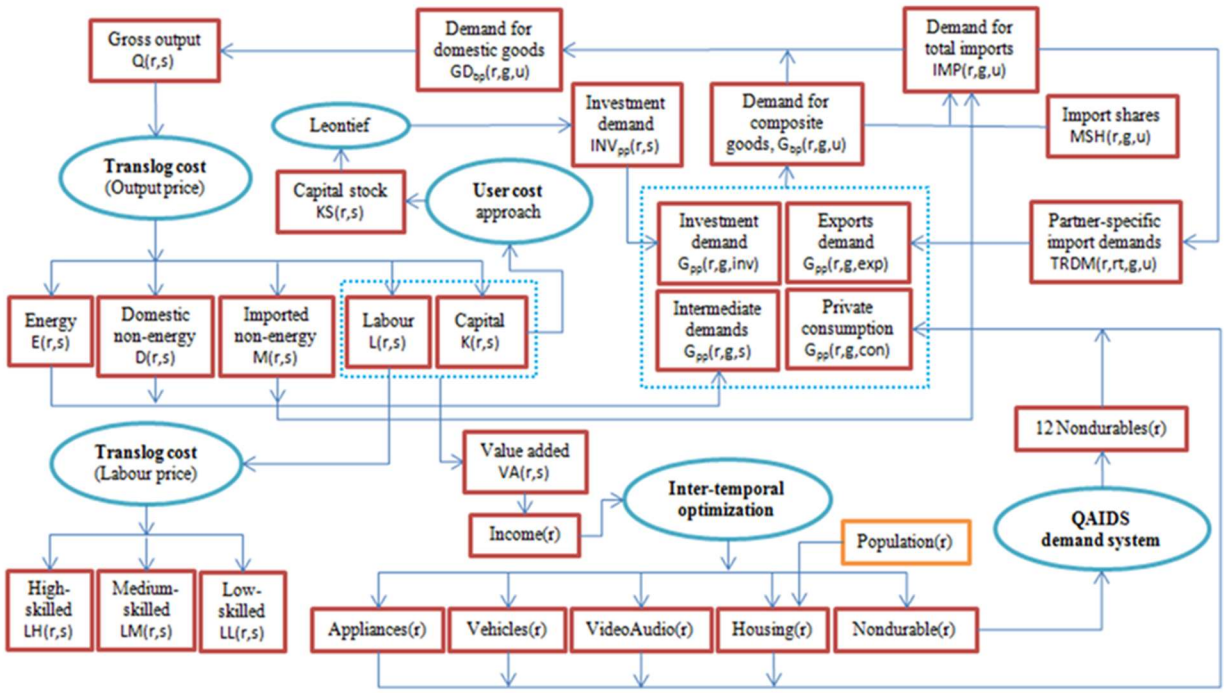
[5] This ranges from BERIO - at the level of the Austrian districts - via FIDELIO - a model of the EU 28 - to ADAGIO, a world model which, depending on the version, comprises between 40 and 67 countries or regions.

[6] For a detailed description of the structures see Kratena et al. (2013, 2017) and Streicher (2009).

[7] The most important federal states for domestic tourism are Styria, Salzburg, Carinthia and Lower Austria. For the "big" tourism regions Tyrol and Vorarlberg - as well as for Vienna - foreign guests are more important than domestic tourism.

[8] Further mechanisms that systematically decouple demand from the residential (or work) region exist, for example, in the school sector; however, these are not relevant to this paper.

Figure 1: Model structure of ASCANIO



Q: WIFO, IPTS.

The model features of ASCANIO include:

- Austria's nine federal states
- 42 further countries (the EU members among them) plus one "rest of the world",
- 63 goods and economic sectors,
- the final demand categories of private and public consumption, investment and exports.

The main variables that ASCANIO simulates are value added and employment as well as prices, by sector and by region. Conceptually, ASCANIO can separate between the impact levels mentioned before (direct, indirect and induced effects).

When interpreting the simulation results, it should be borne in mind that this method only estimates those effects (on value added, employment, etc.) that are linked to LTC sector via direct, indirect and induced impact channels. This does not imply that the Austrian economy would be smaller by the estimated effects if the LTC sector did not exist. If there were no demand for LTC services, resources (expenditure, labour) could flow (at least potentially) into alternative activities. This effect is not considered.[9] This is a major limitation of the input-output

[9] On the other hand, the model simulations also cannot consider spillover effects from LTC services, if, for example, the provision of LTC services enables relatives of LTC patients (in most cases female relatives) to continue with their jobs and careers.

analysis method used here.[10] A similar caveat applies to the employment figures, which do not necessarily consist of additional or "new" jobs. Rather, the figures reflect the number of employees who have been fully "utilised" by the simulated economic effects. The simulated number of jobs thus represents to a certain extent the "required" number, which is covered by a mix of new hires, overtime and the elimination of under-utilisation of existing employment relationships. This mix will not least be determined by the economic situation in the relevant sectors.

As mentioned above, ASCANIO also models tax revenues and social security contributions. The underlying tax ratios were derived from the tax statistics for the years 2007-2012. A fiscal equalisation module connected to ASCANIO estimates the distribution among the local authorities of the federal government, the Länder and the municipalities (aggregated at Länder level). The basis for this is the Financial Equalization Act (FAG) 2005, updated for the FAG 2008 valid at the time of the investigation.

4. Input data

This section examines the integration of inpatient and mobile LTC services into the regional economy. This embedding results from two directions: On the one hand, the LTC services act as consumers of intermediate inputs and investment goods; these are the indirect effects of these services.[11] On the other side, wages and salaries are paid to LTC workers which are used for private consumption (and thus cause induced effects). Taxes and duties are incurred at all levels (with income taxes, goods and value added taxes, and social security contributions as the most important examples in terms of revenue). This economic cycle is modelled using the regional input-output model ASCANIO.

To enable a good representation of these indirect and induced effects, an accurate assessment of the direct effects is necessary, i.e. a description of the production structure (the "technology") in inpatient and mobile care. This production structure describes the goods and services that are purchased as inputs and investments as well as the value added that is generated. The components of value added are wages and salaries and social security contributions as well as depreciation, production taxes, subsidies and profits (together, these last elements form the capital share of value added). The production structure in the LTC sector is not known

[10] A causal analysis in the strict sense would have to be carried out as an empirical analysis of "natural" experiments; in contrast, "general equilibrium models" also use alternative uses only approximatively and can therefore only be interpreted as "causal" with caution. The main purpose of this analysis is not the causal interaction of effects, but the estimation of economic performance that goes beyond the direct provision of LTC services.

[11] An explanatory example: The vehicle used in the mobile LTC services is an investment good; fuel and insurance necessary for the operation of the vehicle represent wholesale demand.

in detail from public sources.[12] A survey of three important and transregional care providers was therefore carried out (detailed results can be found in the appendix).[13]

As expected, the production structures in the inpatient sector differ markedly from those in the mobile sector: At an average of 31%, the use of intermediate inputs in the inpatient sector is twice as high as in the mobile sector; conversely, the share of labour costs (wages and salaries, social security contributions) in the mobile sector, at 84%, is much higher than in the inpatient sector (65%). The commodity structure of intermediate consumption is also very different: the purchase of agricultural goods, food or catering services, which amounts to an average of 8% of the production value in the state sector, plays practically no role in the mobile sector. Certain regional differences can also be observed, less so in the inpatient sector, but slightly more in the mobile sector.

The structures observed are allocated to the total expenditure according to the LTC service statistics for mobile and stationary services broken down by the 9 federal states.[14] The figures for the year 2015 are used (see Table xxx). "Gross expenditure" represents the full amount of costs (and production) in the LTC sector, "net expenditure" the part which is subsidised and paid for by the state budgets (federal and regional). The difference is thus the contribution of the LTC patients from pensions, LTC allowance and self-regress as well as other income (such as the state health fund).

[12] In the national accounts, the official economic statistics, nursing services are found together with other mobile and stationary nursing services (for the sick, children, people with disabilities, etc.) in sectors 88 and 89.

[13] The Caritas regional organisations for Burgenland, Lower Austria, Upper Austria, Styria and Vienna as well as Diakonie and - for mobile care - Volkshilfe (Vienna and two other federal states) were surveyed separately for their mobile and stationary facilities. The questionnaire can be found in the appendix.

[14] For federal states that are not represented in the survey, the averages from the existing federal states without Vienna are used: Vienna as a metropolitan region has special conditions that could be reflected in somewhat different structures, although the survey results do not show any particularly striking differences.

Table 1: Key figures for regional LTC services, 2015

Federal state	Inpatient LTC services [1]) Gross expenditure [Mio. €]	Net expenditure [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Mobile LTC services Gross expenditure [Mio. €]	Net expenditure [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Inpatient + mobile LTC services Gross expenditure [Mio. €]	Net expenditure [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]
Burgenland	72.0	33.6	1.1	0.9	10.1	8.7	0.5	0.3	82.1	42.3	1.6	1.2
Carinthia	190.8	104.5	2.7	2.2	29.0	26.0	1.6	0.8	219.8	130.5	4.3	3.0
Lower Austria	374.4	188.5	5.7	4.8	90.2	58.7	4.4	2.9	464.6	247.2	10.1	7.7
Upper Austria	381.6	182.8	7.4	5.6	72.5	37.3	2.3	1.3	454.1	220.1	9.7	6.9
Salzburg	114.1	58.5	2.9	2.2	23.1	21.2	1.2	0.7	137.2	79.7	4.1	2.9
Styria	436.0	247.5	7.5	5.4	68.3	39.3	2.7	1.2	504.3	286.8	10.2	6.6
Tyrol	163.2	83.8	3.9	2.9	42.3	31.1	1.7	0.8	205.5	114.9	5.6	3.7
Vorarlberg	100.7	58.9	1.9	1.3	25.8	11.9	2.1	0.2	126.5	70.8	4.0	1.5
Vienna	983.2	601.6	9.9	8.6	230.7	152.3	4.9	3.8	1213.9	753.9	14.8	12.4
Total	*2815.9*	*1559.8*	*43.1*	*33.9*	*592.1*	*386.5*	*21.2*	*11.9*	*3408.0*	*1946.3*	*64.3*	*45.8*

Source: LTC Service Statistics 2015. – [1]) Inpatient LTC services including part-time inpatient services, alternative forms of housing and inpatient short-term care. Gross expenditure… public and private expenses; Net expenditure… Federal state and local government expenditure less private contributions and other revenue.

5. Results

Four simulations were carried out, for both inpatient and mobile care: Total private and public expenditure is used to estimate the overall effects of the LTC care services sector (i.e. the total value added or employment linked to the care sector via direct and indirect channels, the production linkages),[15] while net public expenditure (excluding contributions from private individuals and other income) is used to determine the shares of these overall effects associated with the contributions of the Länder and municipalities. Secondly, the induced effects (which result primarily from the consumption effects of LTC sector employees)[16] are estimated separately from direct and indirect effects (which result from the LTC sector in the narrow sense).

The total expenditure of Länder (states), municipalities and private individuals (Table xxx) in the inpatient sector of € 2.8 billion across Austria in 2015 was thus directly and indirectly linked to Austrian value added of about € 2.5 billion. The total effects, i.e. including induced impact channels (consumption effects), are estimated at € 4.8 billion, with revenues from taxes and social security contributions of almost € 2 billion. The mobile area is much smaller: not quite € 500 million in expenditure is associated with a total value added of around € 1 billion, with a tax volume of about € 420 million.

[15] Or „type 1 effect", as they are called in Input-Output modelling.

[16] Or „type 2 effect" in Input-Output parlance.

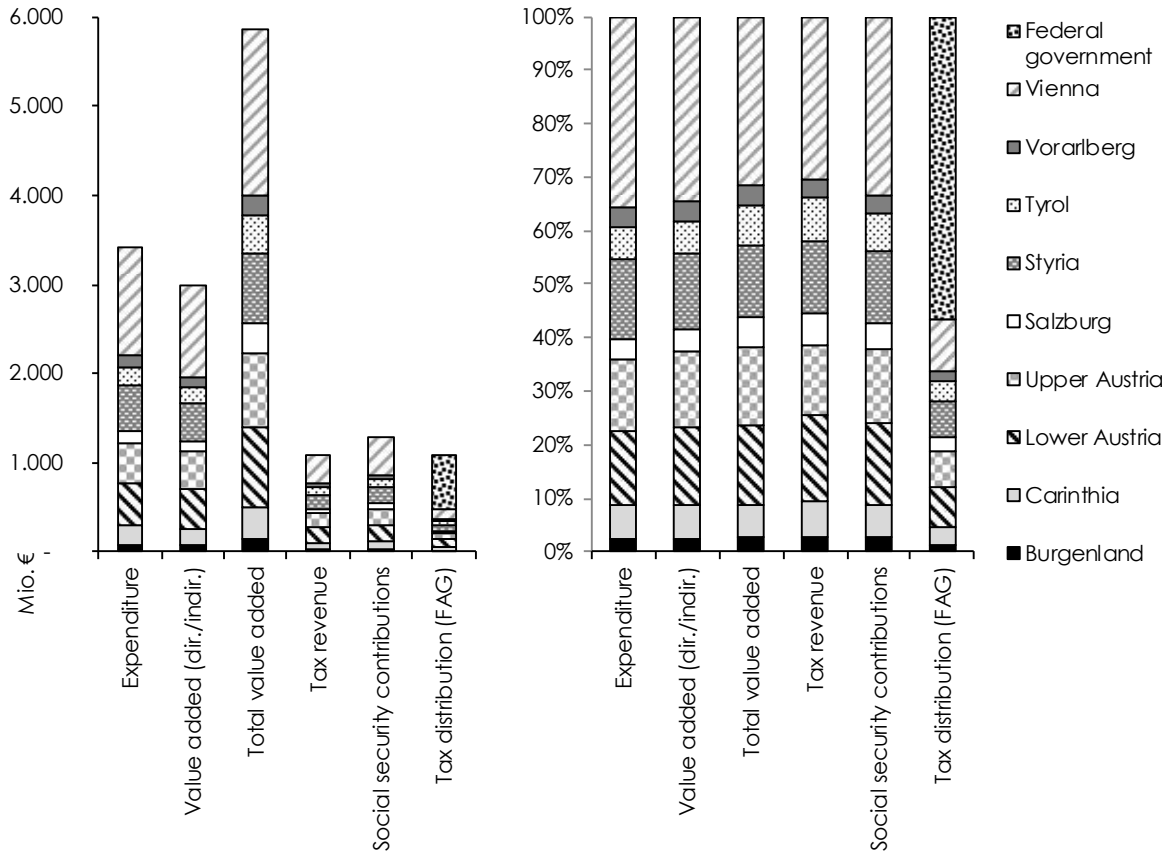
Table 2: Economic effects of total public and private expenditure 2015

		Inpatient LTC [1])						Mobile LTC						Inpatient + mobile LTC					
	Federal state	Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contributions [Mio. €]	Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contributions [Mio. €]	Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contributions [Mio. €]
direct & indirect effects	Burgenland	72.0	65.0	1.5	1.0	4.0	18.0	10.1	10.0	0.5	0.5	1.0	3.0	82.1	75.0	2.0	1.5	5.0	21.0
	Carinthia	190.8	160.0	3.0	2.5	12.0	43.0	29.0	30.0	1.5	1.0	2.0	8.0	219.8	190.0	4.5	3.5	14.0	51.0
	Lower Austria	374.4	345.0	6.5	5.5	24.0	96.0	90.2	85.0	4.5	3.0	5.0	24.0	464.6	430.0	11.0	8.5	29.0	120.0
	Upper Austria	381.6	355.0	8.5	6.5	24.0	88.0	72.5	70.0	2.5	1.5	4.0	19.0	454.1	425.0	11.0	8.0	28.0	107.0
	Salzburg	114.1	105.0	3.0	2.5	9.0	23.0	23.1	25.0	1.0	0.5	2.0	6.0	137.2	130.0	4.0	3.0	11.0	29.0
	Styria	436.0	360.0	8.5	6.0	29.0	94.0	68.3	65.0	3.0	1.5	5.0	19.0	504.3	425.0	11.5	7.5	34.0	113.0
	Tyrol	163.2	140.0	4.5	3.0	10.0	36.0	42.3	40.0	1.5	1.0	2.0	11.0	205.5	180.0	6.0	4.0	12.0	47.0
	Vorarlberg	100.7	85.0	2.0	1.5	6.0	22.0	25.8	25.0	2.0	0.0	1.0	7.0	126.5	110.0	4.0	1.5	7.0	29.0
	Vienna	983.2	850.0	12.0	10.5	79.0	233.0	230.7	180.0	5.5	4.5	19.0	51.0	1213.9	1030.0	17.5	15.0	98.0	284.0
	Total	**2815.9**	**2465.0**	**49.5**	**39.0**	**197.0**	**653.0**	**592.1**	**530.0**	**22.0**	**13.5**	**41.0**	**148.0**	**3408.0**	**2995.0**	**71.5**	**52.5**	**238.0**	**801.0**
Total effect dir., indir. & induced	Burgenland	72.0	125.0	2.5	2.0	24.0	28.0	10.1	25.0	0.5	0.5	5.0	5.0	82.1	150.0	3.0	2.5	29.0	33.0
	Carinthia	190.8	300.0	5.5	4.5	64.0	67.0	29.0	55.0	2.0	1.0	11.0	13.0	219.8	355.0	7.5	5.5	75.0	80.0
	Lower Austria	374.4	720.0	12.5	10.5	144.0	159.0	90.2	165.0	6.0	4.0	32.0	38.0	464.6	885.0	18.5	14.5	176.0	197.0
	Upper Austria	381.6	705.0	14.0	11.0	120.0	148.0	72.5	135.0	3.5	2.0	23.0	31.0	454.1	840.0	17.5	13.0	143.0	179.0
	Salzburg	114.1	280.0	5.5	4.5	54.0	51.0	23.1	60.0	1.5	1.0	11.0	12.0	137.2	340.0	7.0	5.5	65.0	63.0
	Styria	436.0	655.0	13.5	10.5	125.0	145.0	68.3	120.0	3.5	2.0	22.0	28.0	504.3	775.0	17.0	12.5	147.0	173.0
	Tyrol	163.2	350.0	7.5	5.5	71.0	70.0	42.3	85.0	2.5	1.5	17.0	19.0	205.5	435.0	10.0	7.0	88.0	89.0
	Vorarlberg	100.7	180.0	3.5	2.5	32.0	37.0	25.8	45.0	2.5	0.5	7.0	10.0	126.5	225.0	6.0	3.0	39.0	47.0
	Vienna	983.2	1525.0	21.0	17.5	272.0	353.0	230.7	320.0	7.5	5.5	59.0	76.0	1213.9	1845.0	28.5	23.0	331.0	429.0
	Total	**2815.9**	**4840.0**	**85.5**	**68.5**	**906.0**	**1058.0**	**592.1**	**1010.0**	**29.5**	**18.0**	**187.0**	**232.0**	**3408.0**	**5850.0**	**115.0**	**86.5**	**1093.0**	**1290.0**

Source: Own calculations. – 1) Inpatient LTC services including part-time inpatient services, alternative forms of housing and inpatient short-term care.

In total, the care sector (mobile & inpatient) employs 64,000 people directly (corresponding to approx. 46,000 full-time equivalents). The model simulation implies that a further 12,000 employees (or 8,000 full-time equivalents) are indirectly employed by the nursing sector via input links; the total effects of direct, indirect and induced employment are estimated at 115,000 employees (87,000 full-time equivalents). The share of the mobile sector in the estimated employment effects is approximately one fourth and is thus higher than the share of value added (approx. 18%), because here the share and extent of part-time employment is considerably higher than in the inpatient sector. In addition, total public and private expenditure generates tax revenues of around € 1.1 billion and social security contributions of around € 1.3 billion.

Figure 2: Regional distribution of total expenditure and related effects



Source: LTC service statistics, own calculations.

The regional distribution of total expenditure differs from the regional distribution of the associated effects (Figure 2). Shifts between the shares of expenditure and the shares of the direct/indirect value-added effects on the one hand and the induced effects on the other are subject to different regional "redistribution mechanisms": In the case of the direct and indirect effects, these are supply interdependencies in intermediate consumption (e.g. Vienna "loses" here by purchasing agricultural products and food from other regions). In the case of the induced

effects, commuter linkages (which bring about a regional redistribution of disposable income; the eastern region is closely intertwined in this respect), regional purchases (again a very important mechanism for the eastern region) and domestic tourism (which implies a shift in consumer spending towards the important tourism regions) are significant determinants of these regional differences.

As a result, Vienna "loses" in the overall effects, while Salzburg's share of overall effects is about one third higher than its share of expenditure. The public net expenditure - i.e. the parts financed by the federal states and municipalities - amounts on average to 65% of the total costs of the mobile and 55% of the inpatient sector. The regional fluctuation range is high, especially in the mobile sector, between 46% in Vorarlberg and 92% in Salzburg. In the inpatient sector, this share is much more uniform between 47% in Burgenland and 61% in Vienna.

Table 3: Economic effects of public net expenditure on LTC care, 2015

	Federal state	Inpatient LTC services [1])						Mobile LTC services						Inpatient + mobile LTC services					
		Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contri-butions [Mio. €]	Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contri-butions [Mio. €]	Expenditure [Mio. €]	Value added [Mio. €]	Employees [1000 persons]	Employees [1000 FTE]	Tax revenue [Mio. €]	Social security contri-butions [Mio. €]
direct & indirect effects	Burgenland	33.6	30.0	0.5	0.5	2.0	8.0	8.7	10.0	0.5	0.0	1.0	3.0	42.3	40.0	1.0	0.5	3.0	11.0
	Carinthia	104.5	85.0	1.5	1.5	7.0	23.0	26.0	25.0	1.5	0.5	2.0	7.0	130.5	110.0	3.0	2.0	9.0	30.0
	Lower Austria	188.5	175.0	3.5	3.0	12.0	49.0	58.7	55.0	3.0	2.0	4.0	16.0	247.2	230.0	6.5	5.0	16.0	65.0
	Upper Austria	182.8	175.0	4.0	3.0	12.0	43.0	37.3	35.0	1.0	0.5	2.0	10.0	220.1	210.0	5.0	3.5	14.0	53.0
	Salzburg	58.5	55.0	1.5	1.5	5.0	12.0	21.2	20.0	1.0	0.5	1.0	6.0	79.7	75.0	2.5	2.0	6.0	18.0
	Styria	247.5	205.0	5.0	3.5	17.0	53.0	39.3	40.0	1.5	1.0	3.0	11.0	286.8	245.0	6.5	4.5	20.0	64.0
	Tyrol	83.8	75.0	2.0	1.5	5.0	19.0	31.1	30.0	1.0	0.5	1.0	8.0	114.9	105.0	3.0	2.0	6.0	27.0
	Vorarlberg	58.9	50.0	1.0	1.0	4.0	13.0	11.9	10.0	1.0	0.0	1.0	3.0	70.8	60.0	2.0	1.0	5.0	16.0
	Vienna	601.6	515.0	7.5	6.5	48.0	142.0	152.3	120.0	3.5	3.0	12.0	34.0	753.9	635.0	11.0	9.5	60.0	176.0
	Total	**1559.8**	**1365.0**	**26.5**	**22.0**	**112.0**	**362.0**	**386.5**	**345.0**	**14.0**	**8.0**	**27.0**	**98.0**	**1946.3**	**1710.0**	**40.5**	**30.0**	**139.0**	**460.0**
Total effect dir., indir. & induced	Burgenland	33.6	65.0	1.0	1.0	13.0	14.0	8.7	15.0	0.5	0.5	3.0	4.0	42.3	80.0	1.5	1.5	16.0	18.0
	Carinthia	104.5	165.0	3.0	2.5	35.0	37.0	26.0	45.0	2.0	1.0	9.0	11.0	130.5	210.0	5.0	3.5	44.0	48.0
	Lower Austria	188.5	380.0	6.5	5.5	77.0	83.0	58.7	105.0	4.0	2.5	21.0	25.0	247.2	485.0	10.5	8.0	98.0	108.0
	Upper Austria	182.8	360.0	7.0	5.5	62.0	75.0	37.3	80.0	2.0	1.5	14.0	17.0	220.1	440.0	9.0	7.0	76.0	92.0
	Salzburg	58.5	150.0	3.0	2.5	29.0	27.0	21.2	45.0	1.5	1.0	8.0	10.0	79.7	195.0	4.5	3.5	37.0	37.0
	Styria	247.5	370.0	7.5	6.0	70.0	82.0	39.3	70.0	2.0	1.0	13.0	17.0	286.8	440.0	9.5	7.0	83.0	99.0
	Tyrol	83.8	185.0	4.0	3.0	38.0	37.0	31.1	60.0	1.5	1.0	12.0	14.0	114.9	245.0	5.5	4.0	50.0	51.0
	Vorarlberg	58.9	105.0	2.0	1.5	18.0	21.0	11.9	25.0	1.0	0.0	4.0	5.0	70.8	130.0	3.0	1.5	22.0	26.0
	Vienna	601.6	900.0	12.5	10.5	160.0	210.0	152.3	210.0	5.0	4.0	39.0	50.0	753.9	1110.0	17.5	14.5	199.0	260.0
	Total	**1559.8**	**2680.0**	**46.5**	**38.0**	**502.0**	**586.0**	**386.5**	**655.0**	**19.5**	**12.5**	**123.0**	**153.0**	**1946.3**	**3335.0**	**66.0**	**50.5**	**625.0**	**739.0**

Source: Own calculations. – [1]) Inpatient LTC services including part-time inpatient services, alternative forms of housing and inpatient short-term care. Net expenditure… Federal state and local government expenditure less private contributions and other revenue.

These net public expenditures for mobile and inpatient LTC services directly and indirectly generate approximately € 1.7 billion in value added throughout Austria, employing around 41,000 employees (30,000 full-time equivalents) (Table 3). A further 25,000 people are employed via induced impact channels. A total of 66,000 employees (51,000 full-time equivalents) are employed directly, indirectly and induced, which in total amounts to € 3.3 billion of Austrian value added. The resulting revenue from taxes and social security contributions is estimated at almost € 1.4 billion.

The volume of these taxes and social security contributions that is associated with public expenditure on mobile and inpatient care via direct, indirect and induced channels amounts to around € 620 million in taxes and € 740 million in social security contributions, i.e. around 31 or 38% of the net public expenditure of € 1.95 billion. This "tax ratio" is relatively high because LTC services have an above-average labour intensity (and thus relatively high induced effects).

6. Conclusions

The present analysis of their economic impact shows that the total public and private expenditure of € 3.4 billion on LTC services in Austria in the base year 2015 generated a direct added value of € 3.0 billion. Through indirect and induced effects, the sector is linked to value added totalling € 5.9 billion and employing 115,000 jobs or 86,500 full-time equivalents (of which about 71,500 employees or 52,500 full-time equivalents were directly employed in this economic sector). In addition, total public and private expenditure generates tax revenues of around € 1.1 billion and social security contributions of around € 1.3 billion. Public expenditure of € 1.56 billion is linked via direct, indirect and induced channels to around € 620 million in tax revenues and € 740 million in social security contributions. This corresponds in total to around 70% of net public expenditure on LTC. The economic multipliers of the LTC sector are comparatively high due to the high share of wages and salaries in direct expenditure and the associated high direct value added. The degree of "self-financing" of nursing care is therefore considerable, even though important caveats apply as to the "additionality" of the simulated results.

In other words, and to put it in a nutshell: each Euro spent on LTC services is associated with around 1.7 € of domestic value added in the entire economic cycle, as well as around 70 cents in taxes and social security contributions. Public expenditure for professional LTC should therefore not only be regarded as a cost factor or expenditure item in the public budget. Rather, this rapidly growing branch of the economy is becoming an increasingly important economic factor due to demographic developments. In addition, it should be noted that the value added and employment effects associated with these services form strong regional value chains. This produces significant local economic effects due to the high personnel intensity and the comparatively small market radius of many inputs in the production process (such as construction or the preparation of food). For this reason, the LTC services sector can be an important economic factor in ageing and often shrinking rural regions, providing local value creation and employment. Finally, LTC services contribute significantly to labour market policy

objectives regarding the female employment rate. Women still provide the vast majority of informal care for relatives. The absence of appropriate professional LTC services would have negative effects of female labour force participation.

Literature

BMASGK (Federal Ministry of Labour, Social Affairs, Health and Consumer Protection) (2017): Österreichischer Pflegevorsorgebericht 2017, Vienna, https://broschuerenservice.sozialministerium.at/Home/Download?publicationId=673 (downloaded 2/4/2018)

European Commission, The 2018 Aging Report, Economic and Budgetary Projections for the EU Member States (2016-2070), Brussels, 2018.

Famira-Mühlberger, U., Firgo, M. (2018): Aktuelle und künftige Versorgungsfunktion der mobilen Pflege- und Betreuungsdienste in Österreich, WIFO-Studie, Vienna.

Fernández, J.-L., Nadash, P. (2016): The long-term care financing problem, in: Gori, C., Fernández, J.-L., Wittenberg, R., Long-term care reforms in OECD countries.

Grossmann, B., Schuster, Ph. (2017): Langzeitpflege in Österreich: Determinanten der staatlichen Kostenentwicklung, Studie im Auftrag des Fiskalrates, Vienna.

Kratena, K., Streicher, G., Salotti S., Sommer, M., Valderas Jaramillo, J. M. (2017): FIDELIO 2: Overview and theoretical foundations of the second version of the Fully Interregional Dynamic Econometric Long-term Input-Output model for the EU-27, Publications Office of the European Union 2017

Kratena, K., G. Streicher, U. Temurshoev, A. F. Amores, I.Arto, I. Mongelli, F. Neuwahl, J. M. Rueda-Cantuche, V. Andreoni (2013): „FIDELIO – Fully Interregional Dynamic Econometric Long-term Input-Output Model for the EU27", JRC81864, Sevilla

Kompetenzzentrum Qualitätssicherung in der häuslichen Pflege (2018): Auswertung der von den diplomierten Gesundheits-/Krankenpflegepersonen durchgeführten Hausbesuche im Zeitraum von Jänner bis Dezember 2018, https://www.sozialministerium.at/cms/site/attachments/2/8/6/CH3434/CMS1552396370840/auswertung_sb_10012018-08012019_normale_hb.pdf (downloaded 2/4/2018)

Nagl-Cupal, M., Kolland, F., Zartler, U., Mayer, H., Bittner, M., Koller, M., Parisot, V., Stöhr, D. (2018): Angehörigenpflege in Österreich. Einsicht in die Situation pflegender Angehöriger und in die Entwicklung informeller Pflegenetzwerke. Universität Wien. https://broschuerenservice.sozialministerium.at/Home/Download?publicationId=664 (downloaded 2/4/2018)

Streicher, G.: A Regional Projection and Simulation Model of the Austrian Economy. Südwestdeutscher Verlag für Hochschulschriften, 2009

Weissensteiner, M., Buxbaum, A., "Investitionen in bedarfsgerechte Pflegeinfrastruktur – 'überschätzte' Kosten, unterschätzte Potentiale!", WISO, 37(4), 2014, 129-145.

Appendix

Questionnaire

Structure of income and expenditure (separate surveys for inpatient and mobile LTC)

All numbers refer to current operations in the last calendar year (i.e. 2015), not to investments in new facilities.

REVENUE		In Euro
Client contributions		
Public benefit grants from social assistance/ minimum income support		
Other subsidies		
Other revenues		
	REVENUE in total	

EXPENDITURE		In Euro
Wages and salaries		
of which gross wages & salaries, excluding employers' contributions to social security		
of which employer's contributions to social security		
Lease/ rents/ interest paid		
Total depreciation		
of which vehicles		
of which buildings		
of which other depreciation		
Total intermediate consumption/ acquisitions		
of which expenditure for energy and water	Electricity	
	Gas	
	Water	
of which expenditure on building maintenance	Cleaning etc.	
	Repairs & maintenance of technical equipment	
	Repairs & maintenance of structural systems	
of which expenditure for food and beverages	Own kitchen	
	Deliveries of finished menus	
of which expenditure for vehicle fleet	Repairs	
	Insurances	
	Fuels	
of which expenditure for office supplies	IT hardware	
	IT software	
	Other office supplies	
of which expenditure on external medical and therapeutic staff		
of which expenditure on medical products and supplies	Pharmaceuticals	
	Other medical and auxiliary products	
of which expenditure on other external services	Lectures & Training	
	Excursions, etc.	
of which other expenditure		
	EXPENDITURE in total	

Note: Separate survey for mobile and inpatient LTC,

Table 4: Advance services in the production structure mobile and inpatient LTC services
Average over executing agencies and federal states

		Inpatient Long-term care services	Mobile services
		In %	
A01	Crop and animal production, hunting and related service activities	0.2	0.3
B05-09	Mining of coal; petroleum a. natural gas; metal ores; other mining	0.0	0.1
C10-12	Manufacture of food, beverages and tobacco products	5.5	0.1
C13	Manufacture of textiles	0.0	0.0
C14	Manufacture of wearing apparel	0.3	0.3
C15	Manufacture of leather and related products	0.1	0.1
C17	Manufacture of paper and paper products	0.3	0.4
C18	Printing and reproduction of recorded media	0.0	0.0
C19	Manufacture of coke and refined petroleum products	0.1	1.2
C20	Manufacture of chemicals and chemical products	0.5	0.6
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.1	0.1
C22	Manufacture of rubber and plastic products	0.3	0.4
C25	Manufacture of fabricated metal products, except machinery and equipment	0.2	0.3
C26	Manufacture of computer, electronic and optical products	0.1	0.2
C27	Manufacture of electrical equipment	0.0	0.0
C31	Manufacture of furniture	0.7	0.5
C32	Other manufacturing	0.2	0.2
C33	Repair and installation of machinery and equipment	1.2	0.0
D35	Electricity, gas, steam and air conditioning supply	2.6	0.1
E36	Water collection, treatment and supply	0.7	0.0
E37-39	Sewage and refuse disposal, sanitation and similar activities	0.1	0.1
F41	Construction of buildings	1.3	0.0
F43	Specialised construction activities	1.0	1.3
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles	0.0	1.1
G46	Wholesale trade, except of motor vehicles and motorcycles	0.0	0.0
H49	Land transport and transport via pipelines	0.1	0.1
H51	Air transport	0.1	0.1
H52	Warehousing and support activities for transportation	0.0	0.0
H53	Postal and courier activities	0.1	0.2
I55-56	Accommodation; Food and beverage serv. Activities	1.6	0.0
J58	Publishing activities	0.1	0.1
J59	Motion picture, video and television programme production, sound recording and music publishing activities	0.0	0.0
J60	Programming and broadcasting activities	0.0	0.0
J61	Telecommunications	0.2	0.2
J62	Computer programming, consultancy and related activities	0.3	0.3
K64	Financial service activities, except insurance and pension funding	0.5	0.6
K65	Insurance, reinsurance and pension funding, except compulsory social security	0.0	0.4
K66	Activities auxiliary to financial services and insurance activities	0.0	0.0
L68	Real estate activities	6.4	0.5
M69	Legal and accounting activities	0.2	0.3
M70	Activities of head offices; management consultancy activities	0.4	0.6
M71	Architectural and engineering activities; techn. testing and analysis	0.1	0.1
M72	Scientific research and development	0.1	0.1
M73	Advertising and market research	0.1	0.1
M74	Other professional, scientific and technical activities	0.1	0.2
N77	Rental and leasing activities	0.7	0.9
N78	Employment activities	0.4	0.5
N79	Travel agency, tour operator a.o. reservation service a. rel. activities	0.0	0.0
N80-82	Other business support activities	1.7	0.0
O84	Public administration and defence; compulsory social security	0.0	0.0
P85	Education	0.7	0.9
Q86	Human health activities	0.7	0.6
R93	Sports activities and amusement and recreation activities	0.0	0.0
S94	Activities of membership organisations	0.0	0.0
S95	Repair of computers and personal and household goods	0.0	0.0
S96	Other personal service activities	0.4	0.5

Note: For the model calculations, regional differences in the input structures at the level of the federal states were considered to the extent that they were available. For reasons of data protection, however, this table does not include a breakdown by federal states. The remaining shares (to 100%) result from wages and salaries, employers' social security contributions and depreciation. Shaded in grey: Share > 1%.