22nd EBES CONFERENCE - ROME
PROCEEDINGS

MAY 24-26, 2017
ROME, ITALY

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EBES aims to bring worldwide researchers and professionals together through organizing conferences and publishing academic journals and increase economics, finance, and business knowledge through academic discussions. Any scholar or professional interested in economics, finance, and business is welcome to attend EBES conferences. Since our first conference in 2009, around *8697* colleagues from *91* countries have joined our conferences and *4975* academic papers have been presented. Also, in a very short period of time, *EBES has reached 1664 members from 84 countries.*

Since 2011, EBES has been publishing two academic journals. One of those journals, ***Eurasian Business Review*** - *EABR*, is in the fields of industry and business, and the other one, ***Eurasian Economic Review*** - *EAER*, is in the fields of economics and finance. Both journals are published thrice a year and have been published by ***Springer*** since 2014.

Furthermore, since 2014 Springer has started to publish a new conference proceedings series (***Eurasian Studies in Business and Economics***) which includes selected papers from the EBES conferences. The 10th, 11th, 12th, 13th, and 15th EBES Conference Proceedings have already been accepted for inclusion in the Thomson Reuters' ***Conference Proceedings Citation Index.*** The 14th, 16th and subsequent conference proceedings are in progress.

On behalf of the EBES officers, I sincerely thank you for your participation and look forward to seeing you at our future conferences. In order to improve our future conferences, we welcome your comments and suggestions. Our success is only possible with your valuable feedback and support.

I hope you enjoy the conference and Rome, Italy!

With my very best wishes,

Jonathan Batten, PhD

President

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Welcome to the 22nd EBES Conference - Rome

We are excited to organize our *22nd conference* on May 24th, 25th, and 26th, 2017 *at the Faculty of Economics of Sapienza University of Rome in Rome, Italy with the support of the Istanbul Economic Research Association*. We are honored to have received top-tier papers from distinguished scholars from all over the world. We regret that we were unable to accept more papers. In the conference, 265 papers will be presented and 435 colleagues from 59 countries will attend the conference.

We are pleased to announce that distinguished colleagues ***Jonathan Batten, Giuseppe Ciccarone, Giovanni Dosi, Klaus F. Zimmermann,*** *and* ***Marco Vivarelli*** will join the conference as keynote speakers.

Throughout the years, EBES conferences have been an intellectual hub for academic discussion. Participants have found an excellent opportunity for presenting new research, exchanging information and discussing current issues. We believe that our future conferences will improve further the development of knowledge in our fields. In addition, based on the contribution of the paper to the field, the *EBES Award Committee* has selected one of the papers for the *Best Paper Award*. The *Best Paper Award* winner will be announced during the conference.

On behalf of EBES, I would like to thank to *the Faculty of Economics of Sapienza University of Rome* for their hospitality and our sponsor *Istanbul Economic Research Association*, all presenters, participants, board members, and keynote speakers.

I am looking forward to meeting you in person in Rome and seeing you all again at the upcoming EBES conferences.

Best regards,

Ender Demir, PhD
Conference Coordinator

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The Facility Service Industry in Europe

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Abstract: The economic relevance of the Facility Service (FS) industry is still very unclear. There exists no estimation of the value of the FS industry for the whole EU. In addition, a comparison between European countries is missing. Only studies for few local markets are available. Most of them are based on surveys with small populations.

The research question is: How large is the outsourced industry around building operation?

This article presents an answer to this question based on EU statistics and European norms: All services that are necessary to keep buildings up and running and to safeguard their usability are called Facility Services (FS). The European standard EN 15221-4 lists these services. These services are either provided by own employees or are outsourced. Eurostat lists economic activities on a detailed level. By matching the Eurostat list of the official annual detailed enterprise statistics with the activities of the EN 15221-4:2011 the size of the FS market is determined. Value added at factor cost and the number of employees in FS are selected as a measure for industry size. Based on this approach, the size of the FS industry is compared to other industries in the five biggest European countries (measured by GDP).

Results show that based on value added at factor cost, FS are the fourth-largest industry in Germany. In the other countries, FS are also among the biggest industries. In terms of employees, the FS industry even takes the third place in Germany and in the whole EU.

Keywords: Facility Management, Facility Market, Services, Value Added

1 Introduction

The economic relevance of the FM industry is still very unclear. According to Thomzik et al. this has two reasons: First, FS contain many different services and there are different opinions on which services really belong to FS. Second, no sufficient data base was found until now. (Thomzik et al. 2010)

FS are defined as "support provision to the primary activities of an organization, delivered by an internal or external provider" (British Standards 2007). So FS are a support business, which is not separately presented in the statistical classification of economic activities in the European Community (NACE Rev.2) (European Commission/Eurostat 2008). The statistical classification of economic activities of 2002 still listed FM in the description of the activities as a part of "Management of real estate on a fee and contract basis" (European Commission/Eurostat 2002). However, in Germany's version of this NACE structure this position didn't even include the important Facility Services "cleaning" and "maintenance" in contrast to the European structure. (Statistisches Bundesamt 2003). This demonstrates the different views on what Facility Services actually are and shows that the understanding of FS in 2002 and 2003 really doesn't reflect todays definition.

In 2002 a European Norm for FM was created to make cross-border benchmarking possible. In this norm FM was defined and as basis for the benchmarking-norm further norms about FM-agreements, quality, taxonomy and measurements were developed. The technical Committee CEN/TC 348 "Facility Management" also published the EN 15221-4:2011 that lists which services and activities can be considered FS. They are bundled in Facility products. This way FS can be trans-nationally compared (Jensen 2010, Österreichisches Normungsinstitut 2012).

Different parties wish for a well-documented, pan-European, comprehensive overview of the FM-sector (Jensen 2010, EuroFM 2011). This is necessary for transparency in the European FM market, for improving competition in this sector and for creating awareness of the FM industry in European politics. In order to achieve this aim there have already been many attempts to estimate the size of the FM sector (EuroFM 2011).

There are estimations on the national level but a European comparison is missing. The aim of this research is to close that gap by using a new approach. This paper provides results for the five biggest national economies of Europe as long as the data base is sufficient for these single countries. The study includes the outsourced services for business buildings as well as private housing.

2 Literature Review

On a national level a number of market data studies has been conducted.

In Denmark estimations for the whole Danish market have been published. For the study phone interviews have been conducted among the demand and the supply side of FM. The whole Danish market was estimated at the size of 4.9 billion Euro. The results have to be handled with care since there are certain restrictions, e.g. only companies with more than 50 employees have been interviewed. Furthermore, the study also showed that in different studies there have been great differences in the methods of estimating market sizes and in the actual estimations. (Jensen 2010)

In the Netherlands Facility Management Nederland (FMN) and Twynstra estimated the size of the FM market to be 77.2 billion Euro in 2013 for management consultancy. (FMN & Twynstra 2010)

In the Nordic countries interviews with FS suppliers and clients were conducted in 2004. Then the total square meters of building areas excluding private housing were used for the calculation of the potential FM market. For Sweden, Denmark, Finland, Iceland and Norway the estimation was 53 billion Euro. (Jensen 2010)

According to a study from the United Kingdom, the FM market in the UK ranges between 4.5 and 187 billion pounds depending on the report. The differences in the reports are due to different perspectives of FM: Different activities are considered as FM, either the whole market or only the outsourced market or only the field of integrated FM is included. Therefore, the question is raised if we are really intelligent enough to depict the whole FM market. (Moss 2008)

In Germany in 2010 the size of the FM market was calculated on the base of the gross fixed assets of relevant resident and non-resident buildings. The result was that the FM industry is about 5.03% of the gross domestic product. (Thomzik et al. 2010)

The European Facility Management Network (EuroFM) presents even more studies about the size of the FM market in different European countries and describes the problem of comparing data of different countries and providing a common framework. Sven Teichman offered a European approach in 2009. He estimated the size of the internal and the outsourced FM market of the five biggest national economies in Europe and calculated the percentage of GDP. By using this percentage, the defined market types, the degrees of outsourcing and the growth rates of external services for these market types and the top five countries the size of the FM market in European countries was estimated (EuroFM 2011). In the follow-up report the EuroFM describes the attempt to find turnover of the FM industry in all European countries. Unfortunately, data was missing in some countries. A second approach was the usage of the total building area in square meters and the FM costs (EUR/m²) for the calculation. As a pilot project this approach was put into practice in the Netherlands and Belgium. The results were different from the results in the first report but the EuroFM considered this method as useful. For a pan-European comparison a lot of data would need to be collected. (EuroFM 2012)

3 Method

In a first step, the relevant services were identified to assess the size of the FS industry. In order to provide a widely accepted, pan-European picture of the FS industry, the relevant activities from the EN 15221-4 were used. Those activities were compared to the statistical classification of economic activities in the European Community (NACE Rev.2) (European Commission/Eurostat 2008) and the relevant industries for the usage and operation of buildings were selected. The relevant industries were assigned to two different groups:

- Typical Facility Services for the operation of business and residential buildings
- General Facility Services and other relevant industries

Typical Facility Services include services such as cleaning, janitorial services, security services, landscape service activities and other very typical services. General Facility Services and other relevant industries consist of relevant industries for building and infrastructure operation which cannot be assigned clearly such as e.g. combined office administrative service activities and insurances.

Those two groups (typical and general FS and other relevant industries) are added up for the category “Facility Services in total”.

Not included in the calculation are intermediate input services in connection with buildings which are provided for actual FS, such as any Manufacturing Service. All other industries defined by the European Commission such as construction, manufacturing, wholesale and retail trade etc.

also do not include input services. So excluding input services is necessary to compare FS with other industries. However, it must be noted that certain products or services which are mainly produced for FS such as the manufacturing of cleaning or polishing preparations or paint and varnishes are missing now to enable comparability.

The second step consisted of an analysis on the availability of data sources and the selection of the most suitable and reliable data. To ensure comparability for European countries the Annual detailed enterprise statistics for industry, services, trade and construction were selected. They are published online by the European Commission in structural business statistics (European Commission/Eurostat 2016). Structural business statistics present structure, behavior and performance of economic activities on the most detailed level of the statistical classification. It covers the NACE sectors B-N and S95, which are considered as business economy. Agriculture and personal services are not part of it. Those statistics include a huge amount of data and ratios such as turnover, production value, value added at factor cost, employees, investment rate etc. The National Statistical Institutions collect the data from enterprises (European Commision/Eurostat 2015) The data represent the market producers of the industries B-N and S95 (Statistik Austria 2016).

Value added at factor cost was selected as measure. A comparison of turnover would not make so much sense, as turnover includes the inputs of other enterprises and this could lead to double counting. This is avoided if inputs by other enterprises are subtracted from turnover and so the performance of the enterprise can be measured. If also subsidies are added and indirect taxes are subtracted the result is value added at factor cost (Statistik Austria 2016). Eurostat defines value added at factor cost as "gross income from operating activities after adjusting for operating subsidies and indirect taxes". "Alternatively, it can be calculated from the gross operating surplus by adding personnel costs." (European Commission/Eurostat last modified 2013) This means that gross value added at factor cost is also an important indicator for wages and salaries.

Value added at factor cost of the FS industry and the industries defined by the European Commission are presented in percent of total value added of the sectors B-N and S95, which are industry, trade, construction and services. This makes a comparison between different industries and countries easier.

The second measure used is the number of employees working in this industry. The number of employees is also expressed as a percentage of total employment B-N and S95. The number of employees does not contain information on daily working hours of employees.

In order to receive reliable results only countries are included in the analysis which have less than four missing values in the relevant data sets of value added and employees. As plausibility checks value added at factor cost per employee is calculated and minimum, maximum, average and median of the single countries are examined. Outliers and their causes are investigated carefully.

Measured by GDP the five largest economies of the European Union are Germany, United Kingdom, France, Italy and Spain (Statista 2016). Since Spain is missing seven values of subcategories that are part of FS for employees and six in the case of value added, a reliable analysis of Spain cannot be provided. Therefore, the next-largest economy, which is the Netherlands, is included in the study. The Netherlands do not have a solid database for value added (nine values are missing), so the size of the FS-industry is only calculated in terms of employees for this country.

4 Discussion of Data Quality

The EU and the countries Germany, United Kingdom, France and Italy are offering a solid database for estimating the size of the FS industry in terms of value added and employees. For the Netherlands this is only the case for employees. In a second step, the data is checked for plausibility and outliers and noticeable values are carefully examined. The check showed that all data could be used for the calculation.

A look at value added per employee (Table 1) shows variations across countries and different industries. There is a slight tendency that the UK has the highest value added per employee in many industries and Italy the lowest. In most industries the countries are not that far apart. Average and Median are very close together in each row. This shows that there are not many extreme outliers into one direction. Only mining and quarrying and central banking shows outliers. An observation of the columns in Table 1 shows that in all of those nations the industries accommodation and food service activities and repair of computers and household goods show the lowest values. Most industries are not far from that level, however value added per employee is a lot higher in sectors like central banking and mining and quarrying, followed by the energy sector. As the energy industry is one of the highest in all countries this seems reasonable, but the outliers central banking and mining and quarrying have to be examined a bit more. Therefore, value added and the numbers of employees are examined in absolute numbers (see table 2 and 3).

A look at the absolute numbers shows that neither central banking nor mining and quarrying has too extreme absolute values for value added or employment. So the relation was examined more deeply by using additionally personal costs and the gross operating surplus from the annual detailed enterprise statistics. This analysis showed that for mining and quarrying the personal costs only count for 24% of value added in the UK and 9% in the Netherlands. The rest is the gross operating surplus. The percentage of the gross operating surplus is very high especially in the Netherlands, research shows that the Netherlands are an important producer of natural gas and petroleum (U.S. Department of the Interior 2012). In the other countries the gross operating surplus for mining and quarrying lies between 38% and 48% of value added.

Central banking shows similarities to this: In Germany, Italy, France and the Netherlands the gross operating surplus is between 81% and 86% of value added. So the high value added per employee is due to the gross operating surplus. In the UK central banks suffered a loss, but in the UK value added at factor cost per employee is much higher for other monetary intermediation, which are credit institutions. There the percentage of gross operating surplus of value added is also much higher than in the other countries.

In the sectors central banking, other monetary intermediation and insurances data is missing in many countries. So there is the question if it might be better to exclude those sectors completely from the analysis. Due to missing values in subcategories an aggregation of this data to a combined financial sector is not possible, because data could not be compared any more. Furthermore, in Austria the services of the financial sector, the insurances and the pension funding are calculated differently (Statistik Austria 2016). On the other hand, an exclusion of financial data would lead to a big loss of information. Since the sector central banking is so small in absolute terms an exclusion does not seem necessary and worth the informational loss.

Table 2 and 3 show that value added and employment is almost always the lowest in the Netherlands and in most cases the highest in the United Kingdom or Germany. As the Netherlands are the smallest economy of this selection and Germany and the UK are the biggest this is very logical. In terms of value added manufacturing is the biggest industry in all countries except for the Netherlands, followed by wholesale and retail trade. The largest number

of employees can be found in the industry wholesale and trade in the EU, the UK, France and the Netherlands. In Germany and Italy most people are employed in manufacturing.

Value added at factor cost per employee										
	EU (28 countries)	Germany	United Kingdom	France	Italy	Netherlands	Minimum	Maximum	Average	Median
Accommodation and food service activities	20.420	16.460	21.424	36.594	20.274	21.651	16.460	36.594	23.281	21.424
Administrative and support service activities	32.837	31.828	49.323	38.428	29.651	27.162	27.162	49.323	35.278	31.828
Central banking		503.696	49.613	572.865	807.172	725.664	49.613	807.172	531.802	572.865
Construction	39.796	41.112	70.189	50.814	33.736	53.406	33.736	70.189	49.851	50.814
Electricity, gas, steam and air conditioning supply	186.886	196.885	203.156	171.676	305.839	301.970	171.676	305.839	235.905	203.156
Facility Services in total	32.264	35.079	49.608	40.446	33.121		33.121	49.608	39.563	37.762
Information and communication	85.369	96.709	101.493	95.057	85.424	93.908	85.424	101.493	94.518	95.057
Insurance, reinsurance and pension funding, except compulsory social security		147.699	314.581				147.699	314.581	231.140	231.140
Manufacturing	54.882	67.950	72.050	64.169	53.212	84.764	53.212	84.764	68.429	67.950
Mining and quarrying	134.485	89.861	424.876	90.219	126.198	1.064.579	89.861	1.064.579	359.147	126.198
Other monetary intermediation			259.902	163.872	149.742	165.580	149.742	259.902	184.774	164.726
Professional, scientific and technical activities	53.389	61.223	72.455	68.749	43.312	56.319	43.312	72.455	60.411	61.223
Real estate activities	94.450	137.470	77.502	117.036	58.193	193.234	58.193	193.234	116.687	117.036
Repair of computers and personal and household goods	25.717	36.394	51.087	34.717	19.623	26.606	19.623	51.087	33.685	34.717
Transportation and storage	47.473	46.991	67.169	57.721	50.854	65.450	46.991	67.169	57.637	57.721
Water supply; sewerage, waste management and remediation activities	65.000	102.360	114.563	66.971	65.619	106.034	65.619	114.563	91.109	102.360
Wholesale and retail trade; repair of motor vehicles and motorcycles	35.334	41.185	34.752	50.054	34.060	49.003	34.060	50.054	41.811	41.185
Minimum	**20.420**	**16.460**	**21.424**	**34.717**	**19.623**	**21.651**				
Maximum	**186.886**	**503.696**	**424.876**	**572.865**	**807.172**	**1.064.579**				
Average	**64.879**	**103.306**	**119.632**	**107.462**	**119.752**	**202.355**				
Median	**50.431**	**64.586**	**72.050**	**65.570**	**52.033**	**84.764**				

Table 1 Value added at factor cost per employee, 2013, own calculation on the base of annual detailed enterprise statistics (European Commission/Eurostat last modified 2016)

Value added at factor cost (in million €)										
	EU (28 countries)	Germany	United Kingdom	France	Italy	Netherlands	Minimum	Maximum	Average	Median
Accommodation and food service activities	212.348	31.247	42.266	35.857	26.530	8.728	8.728	42.266	28.926	31.247
Administrative and support service activities	443.781	94.702	112.039	71.281	33.151	23.686	23.686	112.039	66.972	71.281
Central banking		5.451	173	7.579	5.672	1.312	173	7.579	4.037	5.451
Construction	487.022	81.035	91.351	86.689	48.764	24.041	24.041	91.351	66.376	81.035
Electricity, gas, steam and air conditioning supply	227.309	43.302	26.308	31.131	26.886	8.170	8.170	43.302	27.159	26.886
Facility Services in total	455.638	112.686	96.223	60.173	50.083		50.083	112.686	79.791	78.198
Information and communication	518.743	107.653	113.514	75.927	46.311	25.139	25.139	113.514	73.709	75.927
Insurance, reinsurance and pension funding, except compulsory social security		23.382	37.788				23.382	37.788	30.585	30.585
Manufacturing	1.630.000	490.617	178.894	192.889	198.679	57.777	57.777	490.617	223.771	192.889
Mining and quarrying	78.459	5.487	27.854	2.175	3.941	11.048	2.175	27.854	10.101	5.487
Other monetary intermediation			109.551	64.719	48.430	17.722	17.722	109.551	60.105	56.575
Professional, scientific and technical activities	625.376	136.200	148.920	97.237	50.841	35.727	35.727	148.920	93.785	97.237
Real estate activities	259.000	70.380	41.839	37.971	17.405	15.202	15.202	70.380	36.560	37.971
Repair of computers and personal and household goods	10.040	1.375	1.859	2.600	870	346	346	2.600	1.410	1.375
Transportation and storage	499.482	96.912	80.946	79.571	53.891	26.771	26.771	96.912	67.618	79.571
Water supply; sewerage, waste management and remediation activities	97.500	21.143	18.871	10.642	11.981	3.478	3.478	21.143	13.223	11.981
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.146.642	245.688	166.917	169.875	115.166	71.745	71.745	245.688	153.878	166.917
Value added at factor cost, B-N, S95 in total	6.235.701	1.454.574	1.199.088	966.141	688.518	330.890				
Minimum	**10.040**	**1.375**	**173**	**2.175**	**870**	**346**				
Maximum	**1.630.000**	**490.617**	**178.894**	**192.889**	**198.679**	**71.745**				
Average	**477.953**	**97.954**	**76.195**	**64.145**	**46.163**	**22.059**				
Median	**449.709**	**75.708**	**80.946**	**62.446**	**39.731**	**17.722**				

Table 2 Value added at factor cost (in million €), 2013, own calculation on the base of annual detailed enterprise statistics (European Commission/Eurostat last modified 2016)

Number of Employees										
	EU (28 countries)	Germany	United Kingdom	France	Italy	Netherlands	Minimum	Maximum	Average	Median
Accommodation and food service activities	10.398.900	1.898.353	1.972.836	979.837	1.308.564	403.122	**403.122**	**1.972.836**	**1.312.542**	**1.308.564**
Administrative and support service activities	13.514.800	2.975.389	2.271.523	1.854.938	1.118.046	872.012	**872.012**	**2.975.389**	**1.818.382**	**1.854.938**
Central banking		10.822	3.489	13.230	7.027	1.808	**1.808**	**13.230**	**7.275**	**7.027**
Construction	12.238.100	1.971.082	1.301.497	1.705.993	1.445.485	450.148	**450.148**	**1.971.082**	**1.374.841**	**1.445.485**
Electricity, gas, steam and air conditioning supply	1.216.300	219.936	129.496	181.335	87.908	27.056	**27.056**	**219.936**	**129.146**	**129.496**
Facility Services in total	14.122.300	3.212.326	1.939.675	1.487.752	1.512.135	526.381	**526.381**	**3.212.326**	**1.735.654**	**1.512.135**
Information and communication	6.076.500	1.113.159	1.118.448	798.750	542.133	267.694	**267.694**	**1.118.448**	**768.037**	**798.750**
Insurance, reinsurance and pension funding, except compulsory social security		158.308	120.122				**120.122**	**158.308**	**139.215**	**139.215**
Manufacturing	29.700.000	7.220.296	2.482.898	3.005.971	3.733.694	681.619	**681.619**	**7.220.296**	**3.424.896**	**3.005.971**
Mining and quarrying	583.400	61.061	65.557	24.108	31.231	10.378	**10.378**	**65.557**	**38.467**	**31.231**
Other monetary intermediation			421.508	394.937	323.423	107.030	**107.030**	**421.508**	**311.725**	**359.180**
Professional, scientific and technical activities	11.713.500	2.224.671	2.055.349	1.414.381	1.173.842	634.378	**634.378**	**2.224.671**	**1.500.524**	**1.414.381**
Real estate activities	2.742.200	511.967	539.845	324.440	299.097	78.672	**78.672**	**539.845**	**350.804**	**324.440**
Repair of computers and personal and household goods	390.400	37.786	36.385	74.895	44.321	12.986	**12.986**	**74.895**	**41.275**	**37.786**
Transportation and storage	10.521.300	2.062.370	1.205.115	1.378.537	1.059.719	409.026	**409.026**	**2.062.370**	**1.222.953**	**1.205.115**
Water supply; sewerage, waste management and remediation activities	1.500.000	206.551	164.722	158.902	182.584	32.800	**32.800**	**206.551**	**149.112**	**164.722**
Wholesale and retail trade; repair of motor vehicles and motorcycles	32.451.100	5.965.438	4.803.146	3.393.860	3.381.283	1.464.080	**1.464.080**	**5.965.438**	**3.801.561**	**3.393.860**
Employees in total	133.046.500	26.637.189	18.691.936	15.704.114	14.738.357	5.452.809				
Minimum	**390.400**	**10.822**	**3.489**	**13.230**	**7.027**	**1.808**				
Maximum	**32.451.100**	**7.220.296**	**4.803.146**	**3.393.860**	**3.733.694**	**1.464.080**				
Average	**10.512.057**	**1.865.595**	**1.213.624**	**1.074.492**	**1.015.656**	**373.699**				
Median	**10.460.100**	**1.505.756**	**1.118.448**	**889.294**	**800.926**	**335.408**				

Table 3 Number of Employees, 2013, own calculation on the base of annual detailed enterprise statistics (European Commission/Eurostat last modified 2016)

5 Results

Table 4 and 5 show the size of the Facility Service industry in percent of the total NACE sectors B-N and S95. The other industries are used as defined by the European Commission for the analysis. Data is sorted by Germany.

Table 4 and 5 show that measured by value added FS are the fourth-biggest industry in Germany. In the other countries and the EU FS are also one of the biggest industries and range between 6% and 8% of value added B-N, S95. In terms of employment in Germany and the EU FS even take place 3. This relation can be explained by the fact that wages and salaries and gross operating profits are not very high in this sector and/or many people are working part time.

Value added at factor cost in percent of total value added at factor cost NACE B-N, S95						
	EU (28 countries)	Germany	United Kingdom	France	Italy	Netherlands
Manufacturing	26%	34%	15%	20%	29%	17%
Wholesale and retail trade; repair of motor vehicles and motorcycles	18%	17%	14%	18%	17%	22%
Professional, scientific and technical activities	10%	9%	12%	10%	7%	11%
Facility Services in total	7%	8%	8%	6%	7%	
Information and communication	8%	7%	9%	8%	7%	8%
Transportation and storage	8%	7%	7%	8%	8%	8%
Administrative and support service activities	7%	7%	9%	7%	5%	7%
Construction	8%	6%	8%	9%	7%	7%
Real estate activities	4%	5%	3%	4%	3%	5%
Electricity, gas, steam and air conditioning supply	4%	3%	2%	3%	4%	2%
Accommodation and food service activities	3%	2%	4%	4%	4%	3%
Insurance, reinsurance and pension funding, except compulsory social security		2%	3%			
Water supply; sewerage, waste management and remediation activities	2%	1%	2%	1%	2%	1%
Mining and quarrying	1%	0%	2%	0%	1%	3%
Central banking		0%	0%	1%	1%	0%
Repair of computers and personal and household goods	0%	0%	0%	0%	0%	0%
Other monetary intermediation			9%	7%	7%	5%

Table 4 Value added at factor cost in percent of total value added at factor cost per employee B-N, S95, 2013, own calculation on the base of annual detailed enterprise statistics (European Commission/Eurostat last modified 2016)

Employees in percent of total employees B-N, S95						
	EU (28 countries)	Germany	United Kingdom	France	Italy	Netherlands
Manufacturing	22%	27%	13%	19%	25%	13%
Wholesale and retail trade; repair of motor vehicles and motorcycles	24%	22%	26%	22%	23%	27%
Facility Services in total	11%	12%	10%	9%	10%	10%
Administrative and support service activities	10%	11%	12%	12%	8%	16%
Professional, scientific and technical activities	9%	8%	11%	9%	8%	12%
Transportation and storage	8%	8%	6%	9%	7%	8%
Construction	9%	7%	7%	11%	10%	8%
Accommodation and food service activities	8%	7%	11%	6%	9%	7%
Information and communication	5%	4%	6%	5%	4%	5%
Real estate activities	2%	2%	3%	2%	2%	1%
Electricity, gas, steam and air conditioning supply	1%	1%	1%	1%	1%	0%
Water supply; sewerage, waste management and remediation activities	1%	1%	1%	1%	1%	1%
Insurance, reinsurance and pension funding, except compulsory social security		1%	1%			
Mining and quarrying	0%	0%	0%	0%	0%	0%
Repair of computers and personal and household goods	0%	0%	0%	0%	0%	0%
Central banking		0%	0%	0%	0%	0%
Other monetary intermediation			2%	3%	2%	2%

Table 5 Number of employees in percent of all employees B-N, S95, 2013, own calculation on the base of annual detailed enterprise statistics (European Commission/Eurostat last modified 2016)

6 Conclusion

The outsourced FS industry is the fourth-biggest industry in Germany in terms of value added and takes place three measured by employment in Germany and the whole EU. This makes the FS industry very important. Furthermore, it must be noted that services around buildings and infrastructure cannot be off-shored. This study only includes the outsourced services, internally effected services are excluded.

There is still further research necessary in this field. First of all, it would be interesting to also include the intermediate input services to examine the impact of the FS industry on other industries compared to other sectors. Second, it would be interesting to evaluate the structure of employment further within the FS sector and to compare the different areas of FS. Calculating more ratios in this area and analyzing and comparing them on a European level over many years could show interesting changes. This could become especially exiting in connection with ongoing changes like the automation of buildings, industry 4.0 and the foreseen increasing use of robots in FM. Therefore, an analysis of the time series would be a great advantage.

7 References

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