*Exporters of knowledge-intensive business services in Basque Country**

Este trabajo analiza las características de las empresas exportadoras entre las empresas de servicios intensivas en conocimiento (KIBS) del País Vasco. El trabajo muestra que el porcentaje de empresas exportadoras en KIBS es superior al de otros servicios, pero inferior al de manufacturas. Los exportadores de KIBS tienen una menor intensidad exportadora que los manufactureros y las exportaciones están menos concentradas por empresa. Las empresas KIBS que exportan son más grandes que las no exportadoras en ventas, empleo, productividad del trabajo y salarios por empleado. Comparado con las empresas manufactureras, el premio exportador de las KIBS es especialmente importante en el salario por trabajador, sugiriendo que la calidad del servicio es un factor clave para estar presente en los mercados exteriores.

Azterlan horretan, Euskadiko ezagutzan intentsiboak diren zerbitzu enpresen arloan (KIBS) esportatzen dituzten enpresen ezaugarriak aztertzen dira. Azterlanak erakusten duenez, KIBSen esportatzaile diren enpresen ehunekoa handiagoa da beste zerbitzu batzuena baino, baina manufakturena baino txikiagoa. KIBSen esportatzaileek manufaktura-enpresek baino gutxiago esportatzen dute, eta esportazioak ez daude hain kontzentratuta enpresa bakoitzeko. Gehien esportatzen duten KIBS enpresak esportatzen ez dutenak baino handiagoak dira enpleguaren, lanaren produktibitatearen eta langileko soldaten ikuspuntutik. Manufaktura-enpresekin alderatuta, KIBSen esportazioaren saria bereziki garrantzitsua da langile bakoitzeko soldatan, eta horrek aditzera ematen du zerbitzuaren kalitatea funtsezko eragilea dela kanpoko merkatuetan egoteko.

I analyze the characteristics of exporting firms in knowledge-intensive business services (KIBS) firms in Basque Country. I show that the share of exporting firms in KIBS is much higher than in other services, although lower than in manufacturing. Exporters of KIBS have lower trade intensities than exporters of manufactures, but exports are less concentrated within firms than in this latter industry. The data shows that exporting firms in KIBS are larger than non-exporters in sales, employment, labor productivity and wages per employee. Compared to manufacturing firms, the export premia in KIBS is especially salient regarding wages per employee, suggesting that quality of the service is a key factor to participate in foreign markets.

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Table of contents

Palabras clave: Exportaciones, servicios intensivos en conocimiento, manufacturas, País Vasco, microdatos de empresa.

Keywords: Exports, knowledge-intensive business services, manufacturing, Basque Country, firm-level data.

JEL codes: F14, F19, F23.

1. INTRODUCTION

The services sector represents the most important activity in terms of value-added and employment in most countries. The most dynamic segment within this sector is the so-called Knowledge-Intensive Business Services, or KIBS. These services are regarded as a key element to improve of living standards, because they generate new knowledge and disseminate it across firms. In fact, the European Commission has documented a strong interrelation between regional GDP and employment growth and the share of KIBS in regional employment (European Commission,

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2012). Hence, having a competitive KIBS sector is considered as a very important element to foster productivity at the regional level.

A regional policy that has been widely used to foster firm-level productivity at the national and the regional level is export-promotion (Gil-Pareja *et al.*, 2015). Several papers have documented that exporters are superior to non-exporters in a wide range of characteristics, such as sales, employment, investment, research and development and productivity (Bernard *et al.*, 2007). The perception is that increasing the number of exporters enhances aggregate productivity at the regional level. However, most of the studies that have documented export premia have been based on manufacturing firms, and very few studies have analyzed whether the superiority of exporters is also present in services in general, and in KIBS in particular. Moreover, most of export promotion policies have been designed for manufacturing firms, since services were not considered internationally tradable.

The aim of this paper is to contribute to fill this gap. As far as I know, for the first time in the literature, regional firm-level data is used to analyze the characteristics of exporting firms in KIBS, and to determine whether exporters are also superior to non-exporters in these economic activities. Moreover, I compare the characteristics and export premia in KIBS to those in manufactures, in order to determine to what extent KIBS are less tradable than manufactures, and whether there are differences in the superiority of exporters over non-exporters across firm characteristics. To perform this analysis, we use firm-level data for the Basque Country region, an autonomous community located in Spain.

The analysis of the exporting firms in KIBS is also relevant for additional reasons. First, during the last decades, exports of services, and specially exports of knowledge-intensive business services, have grown faster than exports of manufactures (Francois and Hoekman, 2010). Regional exports growth can be accelerated if regions specialize in KIBS; to reach this goal, it is important to understand the variables that contribute to the participation of KIBS firms in foreign markets. Second, service exports, and specially KIBS exports, react less negatively to income shocks than manufactures, contributing to smooth the changes in aggregate demand at the regional level (Borchert and Mattoo, 2009; Ariu, 2016b). Third, as shown by Francois *et al.* (2015), services represent a large component of the value-added embodied in manufacturing exports. These authors show that indirect exports are very important in total services exports, especially for KIBS. These facts point out that a highly productive KIBS sector is also crucial to ensure competitiveness in manufacturing exports.[1]

I find that export participation in KIBS is still lower than in manufacturing, but much higher than in other services. Moreover, some KIBS branches, such as scientific research and development, or advertising and market research have reached ex-

[1] For example, Arnold et al. (2015) show that liberalization of services plays a very important role in enhancing productivity in manufactures.

port participation levels that are higher than in many manufacturing industries. Export-intensity is lower in KIBS than in manufacturing, but the gap is narrower than in export participation. Exports are less concentrated within firms in KIBS than in manufactures. The paper shows that exporters operating in KIBS are superior to non-exporters in all the analyzed economic indicators. Results conclude that the exporter´s employment premia is lower in KIBS than in manufactures. In contrast, the exporter´s wage per employee premia is higher in KIBS than in manufactures. This result suggests that skill-intensity, which proxies the quality of service, plays an important role in facilitating firms participation in foreign markets.

The paper is organized as follows. The next section presents the data sources used for the empirical analysis. Section 3 compares some stylized facts on exporters in KIBS, other services, and manufactures. Section 4 estimates the export premia in KIBS, other services, and manufactures, and highlights the main differences between them. Finally, Section 5 presents the main conclusions of the paper.

2. DATA SOURCES

For the empirical analysis, I combine data on establishments operating in KIBS, in other services, and in manufactures. Data on establishments operating in KIBS and other services come from three different surveys carried out by the Basque Statistics Institute (Eustat): the Accommodation Sector Economic Survey, the Business and Professional Services Economic Survey, and the Other Services Economic Survey. The industries included in the study are listed in Annex 1. The 2-digit NACE Rev.2 branches included in KIBS are: computer programming, consultancy and related activities; information services activities; legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis; scientific research and development; advertising and market research; and, other professional, scientific and technical activities. Other services include activities such as accommodation, real estate, rental, security or entertainment.

The establishments sampled in the three surveys are stratified by industry and number of employees; establishments with more employees have a higher probability of being sampled, and above a size threshold, particular to each industry, all establishments are sampled. The services industry surveys are carried out every five years; for our study, we use the surveys carried out in year 2004 and year 2009.

Data on establishments operating in the manufacturing industry were obtained from Eustat's Industry Survey.[2] As in the case of KIBS and other services, establishments are stratified by industry and size. However, in contrast to services, the Industry Survey is carried out every year; for this study we use the all the surveys over the period 2003-2010.

[2] The manufacturing industries included in the sample are also listed in Annex 1.

It should be pointed out that most of the establishments included in the sample correspond to single establishment firms. In particular, 89% of the manufacturing establishments and 76% of service establishments are single establishment firms. Hence, in the rest of the study I will refer to establishments as firms. The surveys report firm level data such as sales, employment, wages or investment. In addition to these variables, firms have to distribute their sales into three geographic areas: the Basque Country, the rest of Spain and foreign markets. I use this distribution of sales to determine firms' export status. It is important to emphasize that surveys do not specify whether firms trade in services, manufactured goods or in both. However, for the case of Spain, previous studies show that most of exports reported by firms operating in services are services, and manufacturers export a small percentage of services (Minondo, 2014b and 2014c).

Table 1 reports the number of firms, employees and value of exports covered by the sample.[3] The sample includes 724 firms operating in KIBS in the year 2004 and 872 firms in the year 2009. The number of firms in other services is 1,502 in the year 2004 and 1,487 in the year 2009. In this latter year the firms included in the sample represented 4% of firms that were operating in KIBS and in other services in the Basque Country. The low coverage is explained by the fact that most services firms have no employees, or have a very low number of employees, and have a lower probability to be sampled by Eustat. In contrast, the coverage rises to 38% in KIBS and 60% in other services regarding employment. In exports, the representativeness of KIBS is 21% and the representativeness of other services is 4%.[4] The number of manufacturing firms included in the sample is higher than in KIBS and other services, and the coverage is also larger: 18%. Taking the year 2009 as reference, the coverage is also high for employment (60%) and specially high for exports (80%). For the manufacturing sector, Table 1 shows that during the period 2004-2007 there is an increase in the number of firms, employees and exports; however, these variables start to decline from the year 2008 onwards. It also shows that there is a very large difference between exports by manufacturing firms and exports by services firms. Although the services sector was three times larger than the manufacturing sector in terms of employment and value added in the year 2009, exports by manufacturing firms were twice the exports of firms operating in services.

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[3] Firms with no sales, no purchases or no employees, and firms with negative or zero value added per employee, are removed from the sample. The Statistical Classification of Economic Activities for the year 2009 (NACE Rev.2) transfer to services some activities that were considered as manufacturing in the previous classification (NACE Rev. 1.1). To compare the data from the year 2004 with the data from the year 2009, we have excluded these activities from the analyses.

[4] The Basque Country does not have a balance of payments. Data on exports of services is obtained from Eustat's Basque Country's input-output table.

Table 1. **DESCRIPTION OF THE SAMPLE**

	KIBS		Other services		Manufacturing							
	2004	2009	2004	2009	2003	2004	2005	2006	2007	2008	2009	2010
Firms	724	872	1,502	1,487	2,133	2,136	2,207	2,352	2,464	2,447	2,330	2,185
Employees	19,745	28,056	55,226	58,252	145,953	146,106	149,116	150,789	155,935	151,778	134,351	128,795
Exports (million €)	148	386	63	53	9,215	10,590	11,810	12,610	14,150	15,370	11,070	13,470

Source: Author's calculations from Eustat surveys.

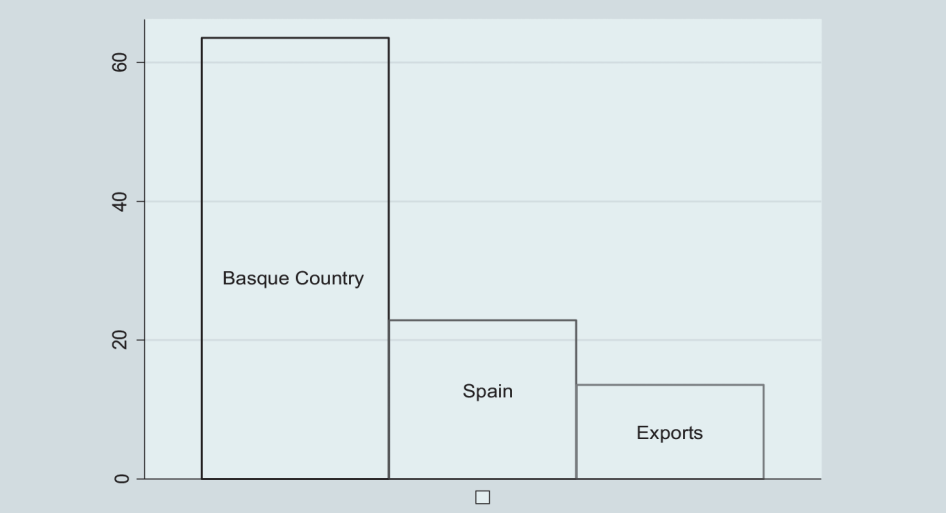
3. EXPORTERS IN KIBS VERSUS EXPORTERS IN OTHER SERVICES AND IN THE MANUFACTURING SECTOR: SOME STYLIZED FACTS

In this section I analyze the differences in international tradability of KIBS versus other services and manufactures, focusing on three stylized facts: percentage of exporters, export intensity and concentration of exports.

Percentage of exporters

Figures 1a, 1b and 1c present the percentage of exporters in KIBS, other services and in manufactures respectively in the year 2009. The percentage of exporters is 3% for other services, 14% for KIBS and 33% for manufacturing. These figures show that within services, the probability to export is almost five times larger in KIBS than in other services. The figure also points out that the probability to export in manufactures is much larger than the probability to export in services. This latter result confirms that services, and specially other services, face a higher «proximity burden» than manufactures, which leads to a lower export participation (Bernard and Hoekman, 2010).[5] We can see that other services have a very large local component: 91% of firms only offered their services in the Basque Country market, and only 5% of firms also offered their services in the Spanish market. In the case of KIBS the weight of the regional market declines to 63%, and the weight of the Spanish market rises to 23%. For manufactures, 47% of firms only sold their products in the regional market, and 20% of firms sold their products in the Spanish market.

Figure 1a. **KIBS. PERCENTAGE OF FIRMS BY MORE DISTANT MARKET COVERED, 2009**



[5] In addition to a higher proximity burden, services encounter more complex trade barriers and those barriers are more difficult to quantify (Grünfeld and Moxnes, 2003).

Figure 1b. **OTHER SERVICES. PERCENTAGE OF FIRMS BY MORE DISTANT MARKET COVERED, 2009**

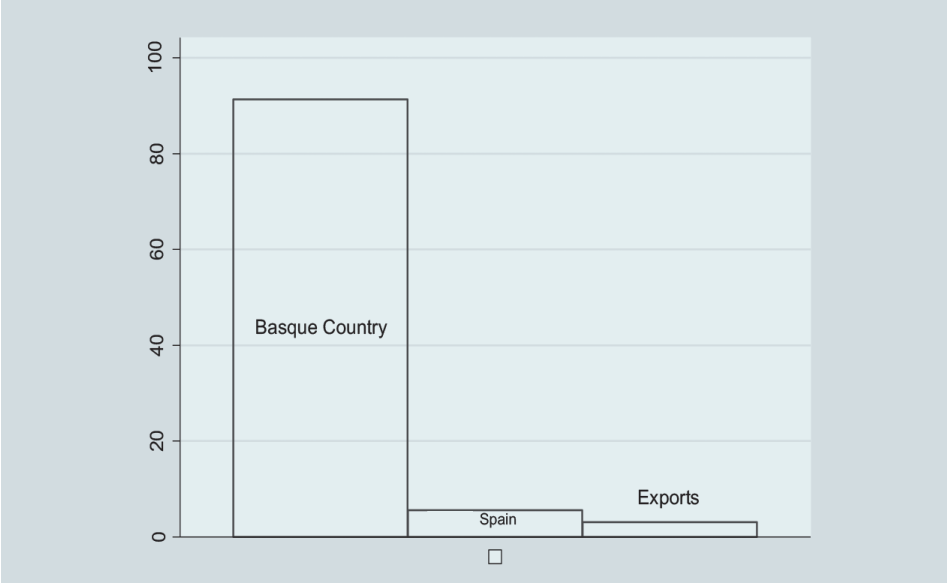
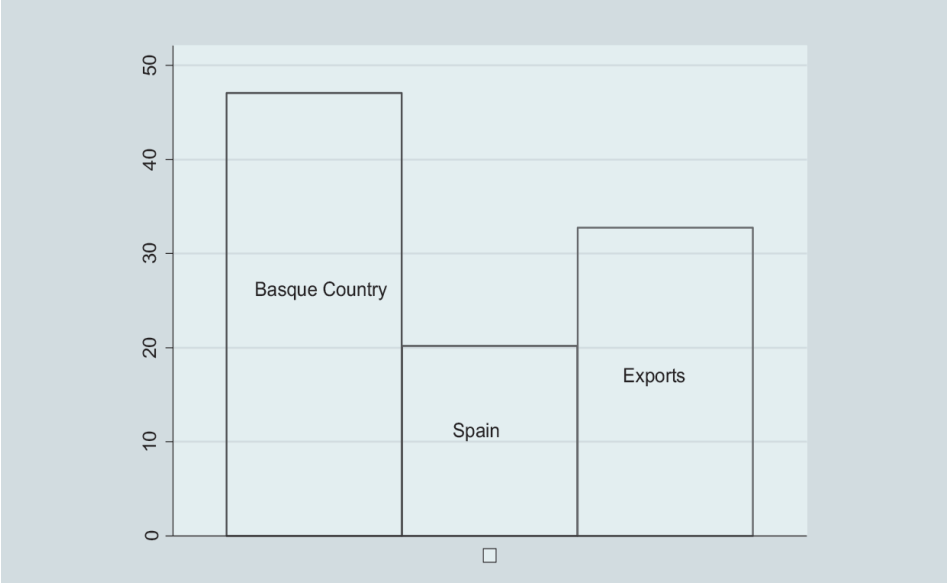


Figure 1c. **MANUFACTURES. PERCENTAGE OF FIRMS BY MORE DISTANT MARKET COVERED, 2009**



Note: In the three figures, percentages are weighted by sample according to population elevation factors.

How does export participation in KIBS in the Basque region compare with other countries? Minondo (2013) shows that the export participation of business services firms with 10 or more employees in Spain in 2007 was 14%. To compare Basque Country with Spain, we have to restrict the Basque Country sample to firms with ten or more employees; this raises the participation of exporters in KIBS to 27%. Vogel and Wagner (2010) and Breinlich and Criscuolo (2011) report a 16% and a 14% export participation for German and British KIBS respectively in the year 2005. Haller *et al.* (2014) report an export participation around 20% for real estate, renting and business activities for Finland (period 2002-2007), France (period 1999-2004) and Ireland (period 2001-2007); for Slovenia the participation rises to around 40% (period 2000-2008). Iacovone *et al.* (2013) report a less than 10% participation rate for Chilean business services firms for the period 2005-2006. For the US, calculations from data presented in Jensen (2011) sets a participation rate for KIBS around 8% for the year 2002. Wolfamayr *et al.* (2013) report a much lower export participation for Austrian firms operating in professional, scientific and technical activities in the period 2006-2009: 0.7%.

Table 2 presents the percentage of exporters in KIBS, other services and manufactures by employment ranges. We define four employment ranges: micro firms (less than 10 employees), small firms (between 10 and 49 employees), medium firms (between 50 and 249 employees), and large firms (more than 249 employees). Both in KIBS and manufacturing, the percentage of exporters rises with the size of the firm. For example, in the case of KIBS moving from the micro to the small category increases export participation from 12% to 21%; upgrading to the next size category, medium, raises the percentage to 34%, and it reaches 54% when the firm is large. These results are in line with those of previous studies that have analyzed the relationship between size and export participation in manufactures (Mayer and Ottaviano, 2007) and in services (Breinlich and Criscuolo, 2011). In the case of other services, we also observe an increase in participation rates when we move from micro to small firms; however, the participation rate does not increase for large-size firms.

Table 2. **PERCENTAGE OF EXPORTERS BY EMPLOYMENT RANGES, 2009**

	Employment ranges			
	1-9	10-49	50-249	>249
% exporters in KIBS	12.0	21.1	34.3	54.0
% exporters in other services	2.9	5.0	4.2	4.2
% exporters in manufactures	16.9	43.1	82.8	91.6

Note: Percentages are weighted by sample according to population elevation factors.

Table 3. **SHARE OF EXPORTERS, 2009 (% of total firms)**

INDUSTRY	%	INDUSTRY	%
KIBS	13.6	Manufacturing	32.7
Activities of head offices; management consultancy activities	2.3	Manufacture of basic metals	72.7
Advertising and market research	41.8	Manufacture of basic pharmaceutical products and pharmaceutical preparations	66.7
Architectural and engineering activities	27.2	Manufacture of beverages	59.2
Computer programming, consultancy and related activities	11.0	Manufacture of chemicals and chemical products	60.6
Legal and accounting activities	0.6	Manufacture of computer, electronic and optical products	52.8
Other professional, scientific and technical activities	9.2	Manufacture of electrical equipment	62.9
Scientific research and development	49.2	Manufacture of fabricated metal products	26.3
		Manufacture of food products	14.4
Other services	3.1	Manufacture of furniture	17.3
Accommodation	13.4	Manufacture of machinery and equipment	63.8
Creative, arts and entertainment activities	23.3	Manufacture of motor vehicles, trailers and semi-trailers	59.7
Employment activities	0.0	Manufacture of non-metallic mineral products	9.0
Food and beverage service activities	0.3	Manufacture of other transport equipment	69.2
Information and communication	1.0	Manufacture of paper and paper products	61.4
Office administrative, office support and other business support activities	8.7	Manufacture of rubber and plastic products	55.6
Other personal service activities	0.1	Manufacture of textiles	16.2
Real estate activities	0.2	Manufacture of wearing apparel and footwear	11.9
Rental and leasing activities	4.0	Manufacture of wood and products of wood and cork, except furniture	24.4
Security and investigation activities	0.0	Other manufacturing	17.8
Services to buildings and landscape activities	0.0		

Note: Percentages are weighted by sample according to population elevation factors.

Table 3 presents the percentage of exporters by branches in KIBS, other services and manufacturing industries. There are notable differences in the percentage of exporters across KIBS. Some branches, such as research and development, advertising and market research, and architecture and engineering have high participation rates; in contrast, other branches such as legal and accounting activities, and consultancy have low participation rates. These lower participation rates might be explained by the fact that in these activities the head offices of the firms operating in Basque Country are located in large cities such as Madrid or Barcelona; and those head offices carry out the more complex international operations. Regarding other services, except for creative, arts and entertainment activities, and accommodation, the participation rates are very low, and in some cases zero.

In manufacturing, all industries have exporters, and there are ten industries where the share of exporters is higher than the share of non-exporters. The industry with the highest share of exporters is basic metals (72.7%), followed by other transport equipment (69.2%), pharmaceutical products (66.7%), machinery and equipment (63.7%), and electrical equipment (63.0%). Other industries, such as paper products, chemicals, motor vehicles, beverages and plastic and rubber products also have a large share of exporters. The manufacturing industries with a low share of exporters are non-metallic minerals (9.0%), wearing apparel and footwear (11.9%), food products (14.4%), textiles (16.2%), and furniture (17.3%).

To sum up, KIBS have a much higher export participation rate than other services, but still lower than manufactures. Notwithstanding that, some KIBS branches have obtained higher participation rates than some manufacturing branches.

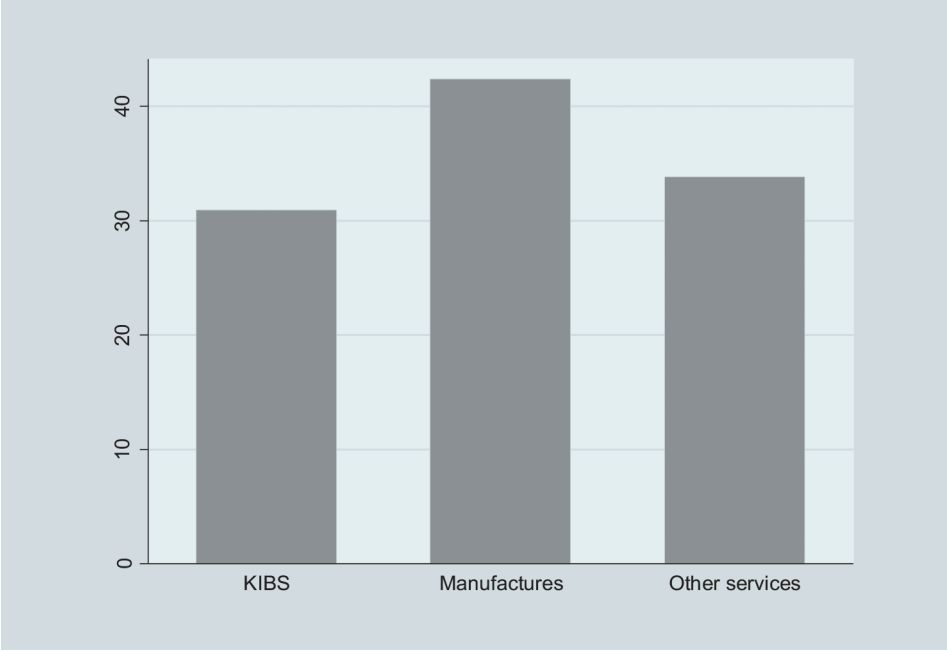
Export intensity

Figure 2 presents the export intensity, measured as exports as percentage of turnover in KIBS, other service and in manufactures. The export intensity in manufactures, 42%, is higher than in other services, 34%, and in KIBS, 31%. However, the differences between services and manufacturing industries are much lower than in export participation (Table 3). Among KIBS, trade intensity is very high in advertising and market research, and in other professional, scientific and technical activities; among other services, we should highlight the high trade intensity in information and communication; finally, in manufacturing, there is a high trade intensity in motor vehicles, basic metals, and other transport equipment.

Previous studies have also analyzed the trade intensity among KIBS firms. For example, Wolfamayr *et al.* (2013) report a low trade intensity for Austrian firms operating in professional, scientific and technical activities: 8.9%. Haller *et al.* (2014) report an export intensity for real estate, renting and business activities of 4% for France, 11% for Finland, 12% for Slovenia and 29% for Ireland. Exporters that operate in business service industries in the UK command a 32% trade inten-

sity (Breinlich and Criscuolo, 2011). Vogel (2011) reports a 20% export intensity for German firms operating in computer and related activities, a 33% for firms operating in research and development, and a 15% for firms operating in other business services. Minondo (2013) reports a 32% export intensity for Spanish business services in the year 2007.

Figure 2. **EXPORT INTENSITY, 2009**



Note: Percentages are weighted by sample according to population elevation factors.

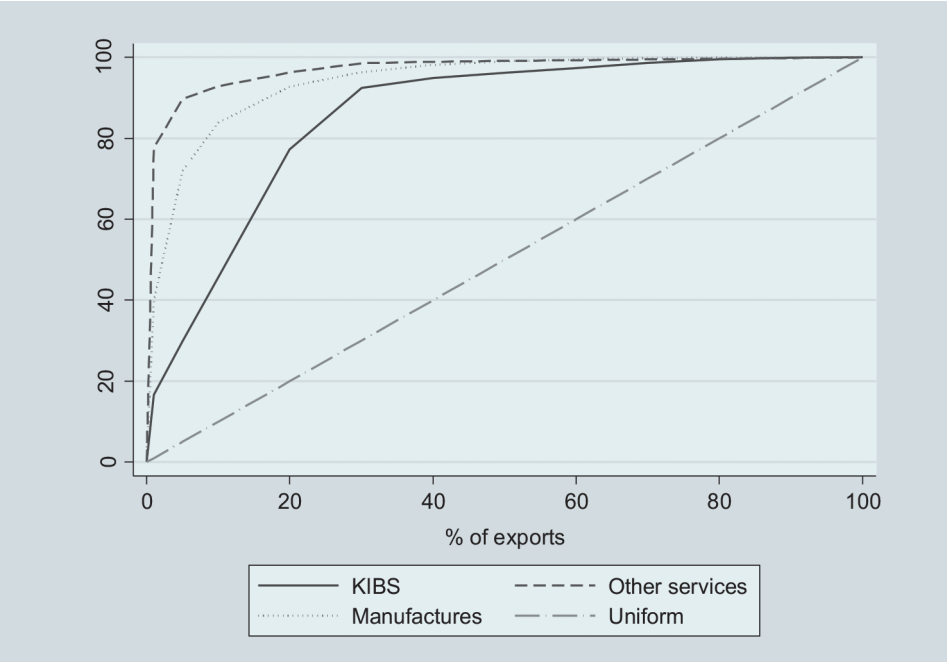
Export concentration

Figure 3 presents the concentration of exports across firms. In other services and manufactures the concentration is much higher than in KIBS. In particular, in manufacturing, the top 1% of exporters account for 40% of exports, the top 5% of exporters account for 72% of exports, and the top 10% of exporters account for 84% of exports. In KIBS, the top 1% of exporters account for 17% of exports, the top 5% of exporters account for 30% of exports, and the top 10% of exporters account for 46% of exports.

Ariu (2016a) and Wolfmayr *et al.* (2013) also find that the concentration of exports across firms in services is lower than in manufactures. Ariu (2016a) explains this fact pointing out that, in contrast to manufacturing, few services firms export more than five types of services to more than five countries. Minondo (2014c),

using data on Spanish firms, also finds that firms concentrate service exports into a small number of destinations and type of services.

Figure 3. **CONCENTRATION OF EXPORTS ACROSS FIRMS, 2009**



Note: Percentages are weighted by sample according to population elevation factors.

4. THE EXPORT PREMIA IN KIBS

As explained at the beginning of the paper, previous studies have indicated that exporters possess certain advantages over non-exporters with respect to different performance indicators. In this section, we estimate the export premia of firms operating in KIBS, and compare that premia with firms operating in other services and manufacturing.

To estimate export premia, I use the descriptive regression equation introduced by Bernard and Jensen (1995):

$$Ln\, Y_{it} = cte + \beta Export + \gamma \ln \text{emp}_{it} + \beta_i + \beta_t + \varepsilon_{it} \quad (1)$$

where Y_{it} is the performance indicator and *Export* is a dummy variable that takes the value of 1 if the firm exports and zero otherwise. This dummy variable captures

the percentage difference in performance between exporters and non-exporters. The estimation controls for firm size (which is proxied by the number of employees), the 4-digit specification for each industry (β_I), and time (β_t). To estimate export premia in KIBS and other services we pool data for the years 2004 and 2009; to estimate export premia in manufacturing we pool data for the period 2003-2010.[6] Sales, purchases and wages are transformed into constant value using the consumption price index; value added is transformed into constant value using the GDP deflator; and investment is deflated using the capital goods price index.[7] We use ordinary least squares (OLS) to estimate the regressions. It is important to emphasize that if there are omitted firm-level characteristics that are correlated with market status and performance (e.g. participation of foreign capital), then OLS estimations could produce biased market status coefficients. Hence, regression results should be interpreted as correlations rather than causations. Different reasons preclude the use of a fixed-effect model to address the omitted-variable bias. First, since the database for exporters in the services sector only covers two years, many firms only have one observation. These observations would be excluded in a fixed effects estimation. Second, export-status is a variable that does not change very often throughout time. In fact, the majority of firms included in our database do not change their export status; since there is no intra-firm change in export status for these firms, they would be excluded in a fixed effects estimation.

Table 5 presents the results of the estimations. We find export premia for all performance indicators in KIBS, other services and manufacturing. In particular, exporters are superior to non-exporters in sales, employment, value-added per employee, total factor productivity, wages per employee and investment. For example, exporters in KIBS have 49% more sales (100*(exp(.42)-1) than non-exporters. These results support the perception that exporters are better than non-exporters, motivating the introduction of policies, both at the national and at the regional level, seeking to increase the number of exporters. If we look across performance indicators we find that there are some differences between the export premia in KIBS and manufacturing. First, export premia in employment is much higher in manufacturing than in KIBS and other services. In particular, the number of employees among exporters in manufacturing is 164% higher than among non-exporters (100*(exp(.97)-1); this figure declines to 68% in KIBS and 49% in other services. This result suggests that the increase in size correlated with exporting is lower in services than in manufacturing. As explained below, this lower premium seems to be related with the contribution of other variables to services firms' success in foreign markets.

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[6] Results are similar if we restrict the sample of manufacturing firms to the years 2004 and 2009.

[7] All deflators are obtained from Eustat´s web page (http://www.eustat.es).

Table 5. **EXPORT PREMIA**

Performance indicator	KIBS	Other services	Manufacturing
Sales	0.40 (0.05)	0.39 (0.04)	0.45 (0.01)
Employment	0.52 (0.07)	0.40 (0.05)	0.97 (0.02)
Value added per employee	0.17 (0.05)	0.27 (0.04)	0.17 (0.01)
Total factor productivity	0.17 (0.05)	0.27 (0.04)	0.17 (0.01)
Wages per employee	0.21 (0.02)	0.22 (0.02)	0.13 (0.01)
Investment	1.22 (0.27)	1.73 (0.23)	1.37 (0.08)
Observations	1,604	2,574	17,954

Note: To estimate export premia in services we pool observations from the year 2004 and 2009. To estimate export-premia in manufacturing we pool observations from the period 2003-2010. All estimations, except those for employment, control for firm size (log of employees), 4-digit industry and year. All dependent variables are in natural logs. Standard deviation in parentheses. All estimations are statistically significant at 1%.

Second, labor productivity and total factor productivity is similar in KIBS and manufacturing, and higher in other services.[8] Ariu (2016a) and Wofmayr *et al.* (2013) also find that total factor productivity is higher in services than manufactures. Minondo (2014a) finds that, among services, labor productivity export premia is lower in Internet-related services industries, where most of KIBS are concentrated, than in non-Internet-related services. These results suggest that exporters of other services have to overcome larger barriers to enter foreign markets than exporters of KIBS and manufactures. These larger barriers might be related with the nature of services that, in many cases, demand the simultaneous presence in space and time of the supplier and the customer (Francois and Hoekman, 2010). As mentioned above, these barriers are attenuated in KIBS through the use of new communication technologies.

Third, the wage per employee export premia is much higher in KIBS and other services than manufacturing. The wage per employee proxies the quality of the service provided. The higher export premia in services suggest that export status is more correlated with quality in services than in manufactures. This result confirms the findings of previous studies that point out that the quality of the service is a key factor to break into foreign markets in services (Iacovone *et al.*, 2013). As Breinlich and Criscuolo (2011) point out, the larger export premia in wage per employee in services firms points out that they export the knowledge embodied in their employees. Since the key to success in international markets seems to rely more on the quality than on

[8] We obtain total factor productivity as the residual of a production function estimation. For manufacturing we also estimate total factor productivity using the Levinsohn and Petrin (2003) procedure. Results are not altered.

the quantity of the labor force, it is reasonable to expect a lower size-premium for service exporters. Finally, the export premia in investment is higher in other services than in KIBS and manufacturing. However, those differences are not statistically significant.

5. CONCLUSIONS

Having a competitive KIBS industry is considered as a key element to ensure high levels of productivity and employment at the regional level. If participating in foreign markets is correlated with better performance indicators, the increase in the number of exporters is a sensible route to raise competitiveness in the KIBS industry. Using firm-level data from the Basque Country region, we show that the share of exporters in KIBS is still lower than in manufactures, but much higher than in other services. We also show that trade intensity among KIBS exporters is not much lower than in manufactures, and exports are more widely spread across firms in KIBS than in manufactures. We also show that exporters operating in KIBS have much better performance in sales, employment, productivity, wages and investment than non-exporters. Comparing with manufacturing employment premia is lower and wage premia is larger in KIBS. This latter result confirms the findings of previous studies which point out that the quality of the service, proxied by the average wage of employees, is a key factor to enhance participation in service exports.

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ANNEX 1.
INDUSTRIES INCLUDED IN THE SAMPLE

NACE Rev. 2 code	Industry
	MANUFACTURING
10	Manufacture of food products
11	Manufacture of beverages
13	Manufacture of textiles
14	Manufacture of wearing apparel
16	Manufacture of wood and products of wood and cork, except furniture
17	Manufacture of paper and paper products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of non-metallic mineral products

.../...

.../...

NACE Rev. 2 code	Industry
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
	KIBS
62	Computer programming, consultancy and related activities
63	Information services activities
69	Legal and accounting activities
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities; technical testing and analysis
72	Scientific research and development
73	Advertising and market research
74	Other professional, scientific and technical activities
	OTHER SERVICES
55	Accommodation
56	Food and beverage service activities
58	Publishing activities
59	Motion picture, video and television programme production, sound recording and music publishing activities
60	Programming and broadcasting activities
68	Real estate activities
77	Rental and leasing activities
78	Employment activities
80	Security and investigation activities
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
90	Creative, arts and entertainment activities
96	Other personal service activities

Source: Author's own elaboration.