Backward linkages and the export performance of business services. Firm level evidence from a sample of Italian firms

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Abstract

We provide evidence on backward linkages between downstream manufacturing sectors and the export performance of Italian services firms. Combining input-output coefficients from the National Accounts with region-level information on market thickness and international involvement of manufacturing sectors, we build four different spillover measures to be tested as determinants of the business service firms' export status. Our results show that, potentially, having competitive and international customers is positively and significantly related to the probability of exporting for the business services firms.

JEL:*L80, L25, D24, F14*

Keywords: *Services, firms'internationalisation, spillovers, backward linkages*

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1 Introduction

During the last 30 years the traditional integrated manufacturing production system has undergone a first shift towards the domestic outsourcing of phases of production to local providers of components and/or specific services (Gianelle and Tattara, 2006). From this, a rapid increase in the number of business service firms performing activities for the manufacturing firm has followed. A second change has concerned and still concerns today the outsourcing of phases of production abroad (offshoring) taking advantage of increased trade integration with low labour cost countries. Also, the ICT revolution has favoured trade in services which were traditionally considered as *non-tradable*.

Services undergo international competition as manufacturing goods and the outcome on export specialization can matter for the long run growth and welfare, since a large part of Business Services (BS) is represented by Knowledge Intensive Business Services (KIBS)[1]. On the other hand the success of service firms in exporting is strictly related to the initial local conditions. If services are naturally born local then their success may be some how related to the export success and efficiency level of their customers. This is what also business studies report.

Despite the centrality of the issue, only recent data availability has allowed some systematic studies on the topic of services firms internationalization. Nevertheless, to the best of our knowledge, no previous research has focussed the attention on the export performance of service firms and the performance of downstream manufacturing sectors. In this respect we believe the issue is central for understanding a country's overall potential for long run growth. Then, we mean to address the relationship between market thickness and export openness in local downstream manufacturing sectors and the export performance of business service firms. We expect that the export openness in downstream manufacturing sectors helps service firms to reduce the cost of acquiring information on the foreign market and we also expect that efficiency and competition in downstream sectors have important feedbacks on the service firms and can matter for their international success.

We test these hypothesis on a sample of Italian business service firms from the 2001-2003 CAPITALIA survey building some measures of backward linkages spillovers based on the national Input-Output coefficients in order to capture the extent of market thickness and openness in downstream manufacturing sectors.

[1] According to the definition adopted by the European Union, KIBS refer to the NACE Divisions 72, 73 and to the professional activities included in the NACE division 74. See the Appendix for more detail.

Then the work is structured as follows: section 2 presents the literature review, section 3 presents the survey and the evidence on internationalisation of services firms in our sample, sections 4 and 5 respectively present the model and the results and section 6 summarizes the findings and concludes.

2 Literature Review

According to the traditional theory of international trade, no matter what you export/import because trade always makes you better. This is also what the most recent contributions in trade theory stress too. After Melitz's (2003) seminal work on heterogeneous firms in international trade the basic idea is that the restructuring brought about by international competition leads to a rise in the average sector TFP due to the reallocation of resources from the less productive firms exiting the market to the most productive ones. Then, as the evidence shows (Mayer and Ottaviano, 2007), a country's comparative advantage is positively correlated with the performance of the firms at the micro level and, if a country generates larger numbers of highly productive firms in some industries than in others, this is due to the national specificities of the entry and exit process at the industry level. Trade and production specialization has no sign here, however Lucas (1988) stresses that different specialization patterns can convey different long run growth rates. In particular, the idea that production of knowledge is central for long run growth is an unquestionable fact clearly stated by the endogenous growth literature contributions (Arrow, 1962, Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992). The picture of dynamic increasing returns led by accumulation of knowledge represents an important message for society and policy makers. However, the theoretical possibility that the free flow of knowledge could produce higher long run growth rates for all of the countries integrated into the world economy is not supported by the evidence. In other words, local conditions matter, as implied by the New Economic Geography Literature. Gathering the notions of external scale economies, of cumulative causation and of backward and forward linkages, this strand of literature has shown that development can well be a very slow path of diffusion of economic activities from the center to the periphery. Summing up, knowledge, specialization local conditions cab be quite relevant in determining the success of the firms in a sector and through this in determining a country's long run growth performance. Then, understanding what is behind the success of services firms in international markets is important. Apart from the general efficiency enhancing effect on downstream firms, the availability of efficient services helps to attract foreign investments, stimulates domestic

growth and, finally, it seems to be out of question that the role of KIBS is central for growth. However, being successful exporters in BS possibly means having successful customers since if services are born local the cost of going abroad may be particularly high for firms in these sectors and the relationship with the customers can stimulate the higher efficiency and can help the flow of the necessary information to become an exporter. From this, the need to uncover whether the success of business service firms is related to their local productive environment. Up to now, the scant empirical literature on the internationalisation of services has just focussed on the main determinants of the export performance [2] and the role for linkages from local downstream manufacturing firms has been neglected.

The research conducted on manufacturing firms, instead, has investigated the role of spillovers in determining the export status and intensity of a firm. Especially the extent of spillovers from other exporting firms or MNEs has been investigated. Externalities of this form can be related to a decrease in the cost of access to foreign markets. The proximity of exporters or MNEs would reduce these costs (Aitken et al., 1997), furthermore the presence of other exporters can lower the cost of production by increasing the availability of specialized capital and labor inputs (Bernard and Jensen, 2004). For the UK, Greenaway et al. (2004) consider spillovers coming from MNEs export activities and MNEs R&D activities in the same sector. They find that MNEs exports have a positive effect on domestic firms probability of being exporters but spillovers don't seem to impact on the export ratio of domestic firms. On the other hand, there are R&D spillovers from multinationals to domestic firms that affect positively both the decision to export and the choice of export ratio. Barrios et al. (2003) examine the effect of spillovers emanating from domestic and MNEs for the export status and intensity of foreign and domestic firms operating in the Spanish manufacturing and they provide evidence for significant differences between the two firm types. They also consider different export destinations, and their results show that Spanish exporters benefit more from spillovers when exporting to more advanced countries than to less technologically advanced countries or, indeed, selling locally. Taymaz and Yilmaz (2009) find a positive externality from export activities of other firms in the same industry in the Turkish manufacturing. Sjoholm (2003) stresses the importance of being in a foreign network: in a sample of Indonesian firms, foreign ownership and importing intermediates make more likely to export while FDI in the region is not really determinant

[2] See Love and Mansury (2009) for the U.S.A., Gourlay, Seaton and Suppakitjarak (2005) for the U.K., Eickelpasch and Vogel (2010) for Germany and Conti et al. (2010) for Italy.

for the firm's export behavior. Following Clerides et al. (1998) who find weak support for both regional and sectoral spillovers in Colombia, Bernard and Jensen (2004) test region-specific, industry-specific, and local (industry and region) export spillovers finding that the latter are negligible[3].

This work is also related to the strand of literature that has started to understand and investigate the linkages between service sectors and manufacturing sectors, even if the focus has always been the efficiency of manufacturing firms and on the potential backward/forward spillovers that could originate from more efficient and internationalised service sectors. Nicolini et al. (2010) for Italy show that the entry of multinational firms in services sectors benefit both upstream and downstream local manufacturing firms' productivity. For Czech Republic, Arnold et al. (2009) find a positive relationship between services sector reform and the performance of downstream manufacturing firms.

In this framework, we mean to provide evidence on the role of spillovers from downstream manufacturing firms in the export performance of knowledge intensive business services (KIBS) firms. The main idea is that if services are naturally born local, due to the need of a close contact with customers, their international activity is a much more difficult task compared to the one performed by manufacturing firms, hence, their ability to cross the borders may depend on their local conditions that could help them to reduce the high cost of exporting. Being in a network with international, efficient and large firms can actually help them to start servicing other markets than the domestic one, and especially it might be the case that service firms go international pushed by the internationalisation strategies of their customers and in order to follow them.

3 The data

The sample - In the following analysis we make use of a sample of business service firms built from the 2001-2003 CAPITALIA survey which provides information on 1,521 firms in the services activities defined according to the NACE Rev.1 classification. The firms included are the ones classified in the Section G (*Wholesale and retail trade repair of motor vehicles, motorcycles*

[3]Region-specific spillovers are captured by export activity in the same state but outside the four-digit (SIC) industry. Industry-specific spillovers occur within the same industry but outside the state of the plant, whereas local spillovers are captured by export activity in the same industry and state as the plant. To gauge the magnitude of exporting activity within each category, they consider two separate forms of the spillover measures. The first is given as the ratio of exporting plants to total plants in the category. The second is given as the ratio of total exports by value to total shipments in the category.

and personal and household goods), I (*Transport, storage and communication*) and Section K (*Real estate, renting and business activities*). We use data for 2003 - the only year for which we have information on the firms' export activity - and after a cleaning procedure[4] we end up with 1211 firms, 658 of which belong to *KIBS* and 553 to the remaining services activities which we can label as *Other BS*.

Table 1: Distribution of Firms across sectors

	KIBS	**Other BS**	**Total**
Section G			
50		2	2
51		133	133
52		163	163
55		16	16
Section I			
60		23	23
63		82	82
64		12	12
Section K			
70		72	72
71		23	23
72	289		289
73	18		18
74	351	27	378
Total	658	553	1,211

Table 2 shows the distribution of firms across the four areas of the Italian territory[5]. We can observe that the highest share of firms is localised in the North, especially the North-West, while the South only accounts for about 16% of the total sample. When we distinguish between *KIBS* activities and other business services we can notice that *KIBS* are mainly concentrated in the North-West of the country while the remaining activities are evenly distributed across the geographical areas.

Representativeness - Unfortunately this sample is a small one and we checked to what extent it can be considered as representative of the service sectors included. We compared the aggregate turnover from our sample with the aggregate turnover for the same economic activities available from the national institute of statistics, ISTAT, in the System of Economic Accounts (SCI) database and, as shown in Table 12 in the appendix, in 2003 our

[4]We drop observations with missing or inconsistent values for the variables of our interest

[5]We split the Italian territory in the following area: North-East, North-West, Centre and South.

Table 2: Distribution of Firms across Italian Areas

	KIBS	Other BS	Total
North-West	257	153	410
North-East	176	155	331
Centre	113	121	234
South	112	124	236
Total	658	553	1,211

firms represent about 2.5% of the total gross turnover in the corresponding sectors, this average percentage jumps almost to 5% if one considers the representativeness of firms in KIBS. It is a small percentage, however if we look at the weight of these firms in 2000, the first year for which we could retrieve data on firms'sales[6], their weight in total sales was just the 2% for the whole sample and the 3% for the KIBS sub-sample. Then although representing a small portion of the firms in business services we could say that our sample conveys information on a dynamic part of the total business service firms. The last column in the Table also reports the importance of our firms'export sales in total export sales. From the ICE-ISTAT yearbook on "External trade and the firms' international activities" (2007) we gathered the data provided by the Bank of Italy on the credits for exports of services[7] and we calculated that in 2003 our firms represented on average about 3% of total exports, however this figure turns to 6% if we consider only KIBS. However these export shares could still represent underestimations of the real shares since the sector definition in the yearbook is very aggregated and does not permit to exclude those public transport services that are not included in our sample.

Finally, the last two rows of Table 12 also report the averages percentages of total sales and exports represented when only the aggregate sales of those business sectors effectively represented in the sample are considered. In Table 12, percentages are displayed in parenthesis and show that the representativeness improves for firms in *KIBS* both in exports and sales. Their share in total turnover almost doubles between 2000 and 2003.

International activity - Turning now to the international involvement of Italian services firms, the questionnaire provides several pieces of information on their export status and intensity, export destinations and also on their FDI (Foreign Direct Investments) and offshoring status. The definition of

[6]We have retrieved from AIDA detailed balance sheet information for firms in our sample.

[7]See page 246 in the publication.

exporter, FDI and offshorer status does not present any difficulty, since the questionnaire provides the following questions:

- In 2003, has the firm sold all or part of its services abroad?
- In the period 2001-2003, has the firm invested abroad?
- At the moment is the firm delocalizing part of its activity abroad?

From these questions we respectively build three dummy variables taking value 1 when firms say yes and 0 otherwise. Table 3 shows that the share of exporters in our sample is by far the most frequent mode of providing services internationally in our sample and that there are not particular differences between our two sub-samples of Business Services. The share of offshorers is higher among *KIBS* and the share of FDI is higher among the remaining activities.

Table 3: Share of firms by mode of internationalisazion (%)

	Exporters	**Foreign Direct Investors**	**Offshorers**
KIBS	21.6	3.2	3.4
Other BS	22.0	3.6	2.2
Total	21.8	3.4	2.9

Finally, for the export activity only, the questionnaire also allows for the identification of the export status and intensity with respect to five destination markets: EU-15; New EU members; other European countries; Extra-European high-income countries and Extra-European low-income countries.

For the following empirical analysis, building on the idea that exporting to more *distant* market represents a more difficult task for a firm, we group these markets according to the presence/absence of trade and/or transport costs[8] into:

- **Europe**: including EU-15, New EU members and other European countries;
- **Extra-Europe**: including Extra-European high-income countries and Extra-European low-income countries.

[8]In this respect, markets are classified as distant both in geographical and economic meaning.

From the latter group, in the estimation of the empirical model we also distinguish the group **Extra-Europe High-income economies**, according to the belief that more developed and distant markets involve tougher competition[9].

Table 4 shows the share of exporters by destinations. Closer markets are preferred by firms in both types of activities, while the share of exporters decreases when the destinations are rich and distant markets.

Table 4: Share of Exporters (%) by destination

	Europe	**Extra-Europe**	**Extra-Europe High**
KIBS	17.2	8.4	6.8
Other BS	20.0	9.5	8.0
Total	18.5	8.9	7.4

Finally, the questionnaire provides one more question allowing us to identify the export intensity:

- What percentage of the total sales [does the firm export]?

Table 5 shows that the export intensity is very low when compared to the export intensity of manufacturing firms (about 30% from the same survey in the same year), however we can find the same pattern we observed for the destinations in the previous Table.

Table 5: Export intensity by destination (%)

	All	**Europe**	**Extra-Europe**	**Extra-Europe High**
KIBS	6.0	3.5	2.4	1.8
Other BS	5.4	4.0	1.3	1.1
Total	5.7	3.8	1.9	1.5

Network relationship - Since we are interested in the role of backward linkages, we exploit some additional information reported in the questionnaire on the firm network and customers. In particular firms can be classified according to their belonging to a group and to their involvement with

[9]We will only focus on high-income markets because, in our sample, the overall number of firms exporting to low-income destinations is very small so it cannot be used in the empirical analysis below.

large/small and industrial/non-industrial customers. Table 6 shows that in our sample about 26% of firms belong to a group (*Group*), the *KIBS* firms sell about 48% of their product in Italy outside the boundaries of their region while this percentage drops to 31% for *Other BS* ($Sale_{nat}$), about 50% of the *KIBS* firms in our sample sell to large industrial firms ($sell_{large}$) and the 59% sells to small and medium firms ($sell_{SMEs}$), while the remaining services firms are more skewed to small and medium sized industrial customers.

Table 6: Relationship with customers and other firms

	$Group(\%)$	$Sale_{nat}(\%)$	$Sell_{large}(\%)$	$Sell_{SMEs}(\%)$
KIBS	26.7	48.0	49.8	58.7
Other BS	24.6	31.0	33.4	44.6
Total	25.8	40.2	42.4	52.3

Group: dummy for firms belonging to a group.
$Sale_{nat}$: Share of Sales the boundaries of their region over Total Sales (%).
$Sell_{large}$: dummy for firms selling to large industrial firms.
$Sell_{SMEs}$: dummy for firms selling to small and medium industrial firms.

4 Modeling export determinants and the role for spillovers

To model the export determinants we build on the following specification:

$$export_{ijr} = \alpha_0 + \alpha_1 X_{ijr} + \beta_0 Spillover_{ijr} + \beta_1 Z_r + \beta_2 D_j + \beta_3 D_a + \epsilon_i \quad (1)$$

here, $export_{ijr}$ is a binary variable taking value 1 if firm i in sector j and region r is an exporter in 2003 and 0 otherwise, Z_r represents regional controls, D_j and D_a respectively represent two digit sector and area dummies (North-West, North-East, Centre and South) and X contains the set of regressors suggested from the theory and from existing empirical literature. The evidence on manufacturing firms suggests that productivity (for a survey see Wagner ,2007), size (Wagner, 2001; Sterlacchini, 2001) innovation (Basile, 2001; Sterlacchini, 2001; Barrios et al., 2003), internal knowledge and market experience (Blomstermo and Sharma, 2003) are important determinant for the firm success in the international competition. Also, the evidence on services firms although limited and more recent stresses a significant relationship between some of these factors and the export performance of services firms. Then gathering these suggestions and building on Conti et al. (2010) we include the following set of firm level regressors in the empirical analysis below:

Table 7: Export Determinants

Variable	Measure of
LP	Labor Productivity
Age, Age^2	experience
Lab, Lab^2	size
$FDIOFF$, FDI or Offshorer	network
$Group$, Being in a group	network
$Sale_{nat}$, $Sale_{nat^2}$, National Sales over Total Turnover	intensity of domestic experience
$Sell_{Large}$	Backward linkages/experience
$Sell_{SMEs}$	Backward linkages/experience
$Inno_{Serv}$, Service innovation	innovation
$Inno_{Proc}$,Process innovation	innovation

However, as stated in the introduction, we believe that studying the performance of service firms also requires attention to the productive environment where the firm operates. In this respect the contribution of this work is mainly devoted to ascertain whether positive feedbacks exist between the competition, efficiency and international involvement in the downstream manufacturing sectors and the international performance of the service firms.

The thickness of the downstream manufacturing markets could actually help the service firms in improving their overall performance: intense competition in the downstream sectors pushes for higher efficiency in suppliers too, the latter could then become competitive in an international arena too. Also, the higher the international involvement of manufacturing downstream firms, the higher the likelihood that service firms go abroad to follow their customers and to find new markets for their services too. Summing up, the fixed cost of exporting can be in general reduced if the overall efficiency and internationalization of the productive environment, and this can be true in particular for services which, being accessory with respect to the production of goods, can find a channel both to improve their efficiency and go abroad. We measure the extent of spillovers from manufacturing to service for each region $\boldsymbol{r}$ and NACE Service two-digit sector $\boldsymbol{j}$ as follows:

$$Spillover = \sum_{h=1}^{n} X_h * S_h, \tag{2}$$

$$S_h = \frac{sales_h}{\sum_{h=1}^{z} sales_h} \tag{3}$$

in the formula above manufacturing sectors are indexed from **1** to **n** and the remaining sectors, including final consumption, from **o** to **z**; $sales_h$ measures the sales from service sector $\boldsymbol{j}$[10] to manufacturing sector $\boldsymbol{h}$[11] and $\sum_{h=1}^{z} sales_h$ is the overall sales from sector $\boldsymbol{j}$. Thus, S_h represents the input-output coefficient from national Input-Output Tables. We use the Symmetric Input-Output Tables available from ISTAT for 2000. Finally, X_h refers to local manufacturing market thickness, efficiency and export performance. We build the following measures of spillovers through backward linkages:

- $N_{reg}^{back} = \sum_{h=1}^{n} N_h * S_h$
  number of manufacturing downstream firms in the same region;

[10]Service sectors are defined at two-digit NACE level.

[11]Downstream manufacturing sectors are defined at NACE subsections. We aggregate the following subsections: DD with DH and DN; DF with DG; DK with DL and DM. This disaggregation is used by ISTAT in the Regional Accounts used to retrieve data of regional-sectoral value added.

- $Exp_{reg}^{back} = \sum_{h=1}^{n} Exp_h * S_h$
  regional manufacturing downstream firms' export openness[12].

For export spillovers we build additional measures capturing the feedbacks coming from the export involvement of manufacturing downstream sectors in different geographical areas:

- $ExpEURO_{reg}^{back}$
  regional manufacturing downstream firms' export openness to European countries;

- $ExpEX_{reg}^{back}$
  regional manufacturing downstream firms' export openness to Extra-European countries;

- $ExpEXhigh_{reg}^{back}$
  regional manufacturing downstream firms' export openness to Extra-European high-income countries;

- $ExpEXlow_{reg}^{back}$
  regional manufacturing downstream firms' export openness to Extra-European low-income countries.

We want to test if stronger effects can be detected whether service firms export to the same destination market than the downstream sectors,according the belief that export costs are country specific.

Finally, in order to control for regional unobservable factors that could affect the probability to export and then affect the identification of our spillovers we include the average level of productivity of manufacturing in the region.

The next section is devoted to the presentation and discussion of the results from the estimation of the empirical model 1. As standard in the

[12]The indicators of regional-sectoral Export Openness are built as the share of total exports on the total value added in the region-sector. Export data are from COE dataset (ISTAT source), while value added is retrieved from Regional Accounts (ISTAT source). We use value added at the denominator instead of the total output (as it is usually done in literature) because we don't have at our disposal the output value for manufacturing sectors at regional level for some regions. These data are available from the Firm Economic Accounts, but ISTAT does not report some figures because of confidentiality. These missing data would lead us to exclude from our analysis 8 regions, for this reason we preferred to replace output with value added. Anyway we have also tried to build the export openness with output data and run the regressions for the restricted sample, and main results confirms the findings we show in the paper. These results are available from the author upon request.

literature, we estimate a probit for the export status. However we are not really able to address the issue of endogeneity and to identify a causal effect of our right hand side variables with respect to the probability of export. For many of our right hand side variables the suspect of endogeneity is unlikely and the direction of causality can be considered almost certain. In particular, we believe that the most likely for endogeneity are the firms' size (Lab) and Labour Productivity (LP), and the dummy $FDIOFF$. Then, interpreting our results as correlations can be limiting but however insightful. Nevertheless, for our variables of interest, namely the spillovers from downstream manufacturing sectors to service firms, we believe that endogeneity is not an issue here and the issue of the direction of causality can be easily solved. In particular, service firms usually start as local- be it regional or national -firms targeted to serve local customers, then it is unlikely that their export status causes local manufacturing firms to go abroad. The same line of reasoning could stand for the direction of causality from efficiency of downstream manufacturing sectors to service suppliers. Anyway, in this case there could be the chance that the probability of the service firm to export has a feedback on the efficiency of its customers. However, since we are not focusing on the feedback from the effective customers of the service firm but on all the potential customers, i.e. downstream manufacturing sectors, it is unlikely the the overall downstream sectors features are affected by an individual service firm export status. Nevertheless, the endogeneity of the remaining regressors could affect the estimates of the coefficients of interest unless there is a zero correlation between the endogenous regressors and the exogenous ones. Table 13 in the Appendix shows the pairwise correlation coefficients for the variables in our model: our variables of interest are not significantly correlated with most of our suspects of endogeneity, in particular none of them is correlated with the dummy $FDIOFF$.

5 Results

Results for spillovers are derived both for the total sample of service firms and for the sub-sample of *KIBS*. For firm level characteristics, we confirm the results shown in Conti et al. (2010). For sake of brevity, we will not discuss them that are described in more detail in that paper. Instead, we will focus on the backward spillover effects that are the main interest of this work.

5.1 International customers

As previously stated, we define our spillover measure as the export openness of downstream sectors. We try to detect the effects of the general international involvement of manufacturing sectors regardless the export destinations, and then we test also if spillovers are destination-specific. Table 8 shows the results for the whole sample of business services. From the evidence we can notice that it is not important the export openness of downstream sectors per se, but what that really matter is the destination-specific experience of manufacturing customers, that turns out to be significant when business service firms enter distant and rich markets. This is confirmed both for the export propensity out of Europe and, especially, for the exports to Extra-European high-income countries. Since the work of Roberts and Tybout (1995), we know that firms entering foreign markets have to face with sunk costs and these costs may be higher for distant markets that require additional efforts[13]. This could be particularly true for service firms that are naturally born-local. In addition our evidence is an indirect test that export sunk costs are destination-specific.

Table 9 shows the results for the sub-sample of *KIBS*. Findings are similar to the previous ones for the total sample, even if in this case also the overall export openness of downstream sectors has a positive impact on the service firms' export status. Anyway the significance is low and the magnitude of the effect seems to be small.

Summing up, our evidence suggests that international experience of customers may reduce the export costs of service firms and ease their penetration in "difficult" markets. Especially, due to the importance of *KIBS* for advanced countries and their long-run growth, these linkages may affect positively the development of the economy.

5.2 Market thickness

Turning to the market thickness of downstream sectors, we make use of the number of plants in the manufacturing sectors. Table 10 shows that spillovers from market thickness are in general important for the export performance of service firms. In this case, effects rise also for the propensity to export to European Countries in addition to distant markets that are difficult to penetrate.

The estimates on the *KIBS* sub-sample in table 11 show that backward

[13]Eaton et al. (2009) shows for France that the number of exporters drop dramatically when exports to distant markets are analyzed. In addition, they show that only larger firms succeed to penetrate the distant markets.

Table 8: Export Openness of downstream manufacturing sectors - All Sectors

VARIABLES	All	Europe			Extra-Europe			Extra-Europe High		
LP	0.011	0.001	0	-0.002	0.037	0.03	0.038	0.035	0.036	0.038
	[0.044]	[0.052]	[0.052]	[0.051]	[0.038]	[0.038]	[0.040]	[0.062]	[0.066]	[0.065]
age	0.019***	0.017***	0.017***	0.017***	0.01	0.011	0.01	-0.001	0.001	-0.002
	[0.005]	[0.006]	[0.006]	[0.005]	[0.008]	[0.008]	[0.008]	[0.009]	[0.010]	[0.009]
age^2	-0.000***	-0.000**	-0.000**	-0.000**	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.388	0.392	0.402	0.389	0.343	0.368	0.321	0.218	0.208	0.195
	[0.255]	[0.266]	[0.267]	[0.269]	[0.264]	[0.269]	[0.273]	[0.278]	[0.296]	[0.279]
Lab^2	-0.055	-0.054	-0.056	-0.054	-0.048	-0.052	-0.045	-0.031	-0.029	-0.027
	[0.035]	[0.035]	[0.035]	[0.036]	[0.032]	[0.032]	[0.033]	[0.031]	[0.033]	[0.031]
$FDIOFF$	0.771***	0.466***	0.471***	0.473***	0.709***	0.731***	0.713***	0.671**	0.718***	0.658**
	[0.176]	[0.164]	[0.166]	[0.163]	[0.218]	[0.213]	[0.224]	[0.262]	[0.267]	[0.273]
$Group$	-0.109	-0.012	-0.012	-0.014	-0.034	-0.031	-0.036	-0.073	-0.066	-0.081
	[0.138]	[0.157]	[0.157]	[0.157]	[0.117]	[0.116]	[0.117]	[0.108]	[0.114]	[0.106]
$Sale_{nat}$	0.044***	0.044***	0.044***	0.044***	0.041***	0.040***	0.041***	0.035***	0.035***	0.035***
	[0.003]	[0.005]	[0.005]	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.377***	0.251***	0.253***	0.258***	0.464***	0.475***	0.487***	0.483***	0.494***	0.501***
	[0.074]	[0.073]	[0.073]	[0.072]	[0.158]	[0.156]	[0.162]	[0.174]	[0.182]	[0.175]
$Sell_{SMEs}$	-0.166**	-0.061	-0.062	-0.058	-0.330***	-0.332***	-0.323***	-0.287***	-0.279***	-0.284***
	[0.070]	[0.075]	[0.075]	[0.076]	[0.084]	[0.082]	[0.086]	[0.075]	[0.079]	[0.079]
$Inno_{serv}$	0.059	0.091	0.091	0.098	0.096	0.103	0.105	-0.049	-0.047	-0.043
	[0.049]	[0.065]	[0.066]	[0.064]	[0.071]	[0.072]	[0.079]	[0.087]	[0.095]	[0.095]
$Inno_{proc}$	0.054	0.047	0.047	0.047	0.037	0.033	0.037	0.059	0.054	0.064
	[0.121]	[0.120]	[0.120]	[0.120]	[0.184]	[0.185]	[0.191]	[0.186]	[0.197]	[0.190]
LP^m_{reg}	0.865*	0.828*	0.751	0.528	0.903	0.257	0.766	0.181	-1.215	0.499
	[0.480]	[0.481]	[0.504]	[0.445]	[0.846]	[0.885]	[0.560]	[1.116]	[1.061]	[0.887]
Exp^{back}_{reg}	0.013	0.018			0.019			0.014		
	[0.013]	[0.013]			[0.024]			[0.028]		
$ExpEURO^{back}_{reg}$			0.011			-0.022				
			[0.014]			[0.023]				
$ExpEX^{back}_{reg}$				0.059*			0.186***			
				[0.035]			[0.057]			
$ExpEXhigh^{back}_{reg}$									0.553***	
									[0.148]	
$ExpEXlow^{back}_{reg}$										0.191
										[0.120]
Const.	-6.003***	-6.124***	-5.659***	-4.845***	-6.562**	-4.043	-6.412***	-3.93	0.284	-5.158
	[1.957]	[2.006]	[2.066]	[1.753]	[3.145]	[3.324]	[2.073]	[4.040]	[3.672]	[3.238]
Obs.	1159	1159	1159	1159	1137[a]	1137[a]	1137[a]	1135[b]	1135[b]	1135[b]
Pseudo-R2	0.223	0.223	0.223	0.223	0.223	0.223	0.223	0.223	0.223	0.223
Log-likelihood	-240.5	-240.5	-240.5	-240.5	-240.5	-240.5	-240.5	-240.5	-240.5	-240.5

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] The drop of observations is because some sector and area dummies predict export status perfectly.

Table 9: Export Openness of downstream manufacturing sectors - KIBS

VARIABLES	All	Europe			Extra-Europe			Extra-Europe High		
LP	0.013	0.006	0.008	0.004	0.143	0.144	0.138	0.301***	0.298***	0.296***
	[0.066]	[0.075]	[0.076]	[0.073]	[0.113]	[0.114]	[0.111]	[0.099]	[0.106]	[0.098]
age	0.009	0.005	0.005	0.005	0.007	0.007	0.008	0.005	0.007	0.004
	[0.014]	[0.013]	[0.013]	[0.013]	[0.012]	[0.012]	[0.012]	[0.016]	[0.016]	[0.015]
age^2	0	0	0	0	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.264	0.199	0.201	0.196	0.164	0.17	0.16	0.06	0.038	0.063
	[0.320]	[0.294]	[0.292]	[0.296]	[0.416]	[0.413]	[0.420]	[0.405]	[0.427]	[0.403]
Lab^2	-0.035	-0.028	-0.029	-0.028	-0.028	-0.028	-0.027	-0.006	-0.003	-0.007
	[0.043]	[0.039]	[0.039]	[0.040]	[0.052]	[0.052]	[0.053]	[0.048]	[0.052]	[0.048]
$FDIOFF$	0.801***	0.291	0.292	0.313	0.703***	0.714***	0.722***	0.49	0.531	0.518
	[0.235]	[0.205]	[0.209]	[0.211]	[0.243]	[0.244]	[0.249]	[0.317]	[0.327]	[0.336]
$Group$	-0.042	0.078	0.079	0.075	-0.039	-0.042	-0.041	-0.005	0.002	-0.022
	[0.145]	[0.173]	[0.173]	[0.172]	[0.087]	[0.089]	[0.083]	[0.113]	[0.111]	[0.110]
$Sale_{nat}$	0.046***	0.045***	0.045***	0.044***	0.040***	0.040***	0.040***	0.035***	0.034***	0.034***
	[0.005]	[0.006]	[0.006]	[0.006]	[0.009]	[0.009]	[0.009]	[0.010]	[0.010]	[0.010]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.508***	0.352***	0.349***	0.357***	0.764***	0.758***	0.774***	0.923***	0.956***	0.917***
	[0.093]	[0.117]	[0.117]	[0.118]	[0.139]	[0.138]	[0.138]	[0.140]	[0.144]	[0.137]
$Sell_{SMEs}$	-0.278**	-0.121	-0.121	-0.126	-0.626***	-0.627***	-0.626***	-0.624***	-0.610***	-0.637***
	[0.108]	[0.112]	[0.112]	[0.115]	[0.114]	[0.112]	[0.115]	[0.096]	[0.102]	[0.093]
$Inno_{serv}$	-0.102	-0.027	-0.031	-0.017	-0.092	-0.096	-0.076	-0.221*	-0.203	-0.202*
	[0.092]	[0.117]	[0.118]	[0.113]	[0.089]	[0.089]	[0.087]	[0.131]	[0.140]	[0.122]
$Inno_{proc}$	0.163	0.112	0.114	0.114	0.164	0.168	0.164	0.17	0.142	0.186
	[0.138]	[0.158]	[0.159]	[0.159]	[0.133]	[0.133]	[0.133]	[0.178]	[0.179]	[0.180]
LP^m_{reg}	1.731***	1.159*	1.311*	0.807	1.860***	1.901***	1.329*	1.256***	-0.696	0.994**
	[0.519]	[0.612]	[0.693]	[0.602]	[0.680]	[0.709]	[0.735]	[0.478]	[0.643]	[0.423]
Exp^{back}_{reg}	0.026*	0.022*			0.028**			0.040*		
	[0.014]	[0.013]			[0.013]			[0.022]		
$ExpEURO^{back}_{reg}$			0.028			0.026				
			[0.020]			[0.019]				
$ExpEX^{back}_{reg}$				0.051			0.101***			
				[0.032]			[0.034]			
$ExpEXhigh^{back}_{reg}$									0.371***	
									[0.070]	
$ExpEXlow^{back}_{reg}$										0.156
										[0.105]
Const.	-9.289***	-7.134***	-7.423***	-5.593***	-10.475***	-10.475***	-8.527***	-8.928***	-2.487	-7.488***
	[2.129]	[2.440]	[2.566]	[2.156]	[2.718]	[2.728]	[2.694]	[2.156]	[2.200]	[2.074]
Obs.	635	635	635	635	635	635	635	526[b]	526[b]	526[b]
Pseudo-R2	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245
Log-likelihood	-114.2	-114.2	-114.2	-114.2	-114.2	-114.2	-114.2	-114.2	-114.2	-114.2

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] The drop of observations is because some sector and area dummies predict export status perfectly.

thickness spillovers disappear for the propensity to export to European countries, while the only effect that still stay significant and positive affect the export activities in Extra-European high-income countries, even if the significance is low.

Our predictions are again confirmed. Being involved in an efficient local context help the internationalisation of service firms.

Table 10: Market Thickness of downstream manufacturing sectors - All Sectors

VARIABLES	All	Europe	Extra-Europe	Extra-Europe High
LP	0.008	-0.003	0.025	0.025
	[0.043]	[0.051]	[0.039]	[0.063]
age	0.019***	0.017***	0.009	-0.002
	[0.005]	[0.006]	[0.008]	[0.009]
age^2	-0.000***	-0.000**	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.404	0.414	0.417	0.302
	[0.252]	[0.268]	[0.284]	[0.304]
Lab^2	-0.058*	-0.057	-0.058*	-0.041
	[0.035]	[0.036]	[0.035]	[0.035]
$FDIOFF$	0.774***	0.473***	0.702***	0.645**
	[0.174]	[0.163]	[0.212]	[0.258]
$Group$	-0.109	-0.012	-0.044	-0.097
	[0.139]	[0.158]	[0.118]	[0.108]
$Sale_{nat}$	0.044***	0.044***	0.041***	0.036***
	[0.003]	[0.005]	[0.006]	[0.006]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.382***	0.258***	0.480***	0.501***
	[0.073]	[0.072]	[0.163]	[0.179]
$Sell_{SMEs}$	-0.167**	-0.061	-0.346***	-0.311***
	[0.071]	[0.075]	[0.089]	[0.079]
$Inno_{serv}$	0.065	0.101	0.122	-0.028
	[0.048]	[0.063]	[0.086]	[0.103]
$Inno_{proc}$	0.049	0.039	0.002	0.014
	[0.122]	[0.121]	[0.198]	[0.205]
LP^m_{reg}	0.513	0.316	-0.555	-1.662*
	[0.559]	[0.542]	[0.668]	[0.952]
N^{back}_{reg}	0.061	0.089**	0.411***	0.491***
	[0.046]	[0.045]	[0.088]	[0.151]
Const.	-4.953**	-4.524**	-3.954*	0.381
	[2.017]	[1.935]	[2.368]	[3.365]
Obs.	1159	1159	1137[a]	1135[b]
Pseudo-R2	0.199	0.199	0.199	0.199
Log-likelihood	-247.8	-247.8	-247.8	-247.8

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] See the note of Table 8.

Table 11: Market Thickness of downstream manufacturing sectors - KIBS

VARIABLES	All	Europe	Extra-Europe	Extra-Europe High
LP	0.013	0.002	0.139	0.284***
	[0.065]	[0.071]	[0.115]	[0.107]
age	0.009	0.006	0.007	0.004
	[0.014]	[0.013]	[0.012]	[0.015]
age^2	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.26	0.195	0.179	0.084
	[0.316]	[0.297]	[0.412]	[0.416]
Lab^2	-0.036	-0.028	-0.029	-0.008
	[0.042]	[0.040]	[0.051]	[0.049]
$FDIOFF$	0.834***	0.336	0.749***	0.551
	[0.257]	[0.220]	[0.269]	[0.357]
$Group$	-0.042	0.086	-0.046	-0.029
	[0.146]	[0.174]	[0.086]	[0.115]
$Sale_{nat}$	0.045***	0.044***	0.040***	0.034***
	[0.005]	[0.006]	[0.009]	[0.010]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.511***	0.354***	0.756***	0.908***
	[0.092]	[0.120]	[0.136]	[0.139]
$Sell_{SMEs}$	-0.290***	-0.127	-0.631***	-0.632***
	[0.108]	[0.117]	[0.112]	[0.094]
$Inno_{serv}$	-0.094	-0.011	-0.084	-0.204*
	[0.091]	[0.111]	[0.090]	[0.114]
$Inno_{proc}$	0.171	0.11	0.173	0.174
	[0.140]	[0.163]	[0.139]	[0.179]
LP^m_{reg}	1.466***	0.556	1.314*	-0.261
	[0.547]	[0.486]	[0.768]	[0.659]
N^{back}_{reg}	-0.001	0.112	0.044	0.188*
	[0.061]	[0.088]	[0.055]	[0.102]
Const.	-7.662***	-5.098***	-8.088***	-3.332
	[2.032]	[1.944]	[2.866]	[2.287]
Obs.	635	635	635	526[b]
Pseudo-R2	0.235	0.235	0.235	0.235
Log-likelihood	-115.7	-115.7	-115.7	-115.7

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] See the note of Table 9.

5.3 Further robustness checks

These sets of results are robust to a number of checks. In particular, we have tried to replace, as regional control, the average labour productivity of manufacturing firms with their average size in the region. Export spillovers still stay significant, while thickness spillovers loose sometimes their significance.

Secondly, we have tried to use a different input-output coefficient for the construction of spillover indicators. Following Javorcik (2004) we calculate the proportion of sector $\boldsymbol{j}$ output supplied to manufacturing sector $\boldsymbol{k}$ excluding products supplied for final consumption, that is taking into account (at the denominator) the total of intermediate products, instead than the total production of the sector. The findings mimic the results shown above.

Following the suggestion of Moulton (1990) we cluster the observations at sector-region level in order to correct the downward bias in the estimation of standard-errors that may rise when individual variables are regressed on aggregate variables[14]. Main findings and significance do not change. Results for these checks are available upon request.

Finally we have excluded from our analysis firms in Lombardia because an important share of service firms are localised in this region and we want to make sure that the effects are not driven only by this region. We report these results in the Appendix (Tables 14, 15, 16 and 17). Backward spillovers are confirmed to be significant and positively related to international performance of firms in business services.

6 Conclusion

This paper has dealt with the determinants of internationalization in Italian service firms. Within the limited evidence on this topic, to the best of our knowledge, this is the first piece of research investigating the backward linkages from downstream manufacturing sectors to service firms. Using standard econometric techniques our results convey interesting suggestions. The findings show that the thickness in downstream manufacturing sectors matter for the export performance of the service firms, especially when the destination countries are distant and high income countries that make the export activity a difficult task.

As far as the international involvement of downstream manufacturing is concerned, only destination-specific export openness of manufacturing sectors

[14]Up to now standard errors have been clustered at regional level, because in the regression we include a regional control (the average labour productivity of manufacturing sector at the regional level). As a consequence the region is the higher level of aggregation of our regressors.

play a significant role. Especially service firms' export performance in rich and distant markets is positively related to the international involvement of manufacturing downstream sectors in the same geographical areas.

The evidence we show is strictly related to other strands of literature that usually try to detect the impact of the efficiency of service sectors on the performance of manufacturing sectors. There are important complementarities between service and manufacturing sectors and these effects may help to the development and growth of a country. In this framework is important to take into account the process of the internationalization of both industrial and services firms that may sustain each other and improve firms' efficiency.

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Appendix

Table 12: Representativeness of the sample

		Share of Turnover		Share of Exports
		2000	2003	2003
Section I:				
60	Land Transport	0.25%	0.37%	0.36%[a]
63	Supporting and auxiliary activities	1.07%	1.24%	-
64	Post and Telecommunications	0.32%	0.45%	0.01%
Section K:				
71	Renting of machinery and eq.	3.00%	2.06%	0.06%
72	Computer and related activities	5.54%	7.73%	14.17%
73	R&D	2.09%	4.66%	1.58%
74	Other business activities	1.64%	1.50%	2.41%
	Average	1.99%(3.38%)	2.57%(5.78%)	3.10%(4.09%)
	Average KIBS	3.09% (3.42%)	4.63%(8.43%)	6.05% (8.04%)

Source: ICE-ISTAT, own calculations.
[a] refers to the share of sectors 60 and 63 considered as a whole.

Table 13: Correlations

	LP	age	age^2	Lab	Lab^2	$FDIOFF$	$Group$	$Sale_{nat}$	$Sale^2_{nat}$	$Sell_{Large}$	$Sell_{SMEs}$	$Inno_{serv}$	$Inno_{proc}$	LP^m_{reg}	Exp^{back}_{reg}	N^{back}_{reg}
LP	1															
age	0.072	1														
age^2	0.046	0.883*	1													
Lab	-0.108*	0.124*	0.078*	1												
Lab^2	-0.097*	0.116*	0.071	0.978*	1											
$FDIOFF$	0.013	0.037	0.038	0.121*	0.152*	1										
$Group$	0.188*	-0.081*	-0.048	0.244*	0.24*	0.086*	1									
$Sale_{nat}$	0.158*	-0.088*	-0.076*	0.08*	0.08*	0.094*	0.12*	1								
$Sale^2_{nat}$	0.149*	-0.087*	-0.07	0.089*	0.09*	0.066	0.124*	0.978*	1							
$Sell_{Large}$	0.047	-0.032	-0.052	0.039	0.031	0.05	0.026	0.179*	0.141*	1						
$Sell_{SMEs}$	0.021	0.005	-0.02	-0.071	-0.072	-0.058	-0.028	-0.016	-0.044	0.306*	1					
$Inno_{serv}$	0.014	-0.055	-0.068	-0.008	-0.015	0.016	0.004	0.084*	0.066	0.107*	0.09*	1				
$Inno_{proc}$	-0.009	-0.081*	-0.071	0.069	0.058	0.019	0.048	0.16*	0.155*	0.087*	0.063	0.412*	1			
LP^m_{reg}	0.197*	0.063	0.065	-0.051	-0.035	0.059	0.07	0.174*	0.169*	0.124*	0.065	0.058	0.062	1		
Exp^{back}_{reg}	0.088*	0.044	-0.015	0.004	-0.002	0.059	0.032	0.215*	0.189*	0.088*	0.011	-0.017	0.021	0.354*	1	
N^{back}_{reg}	0.146*	-0.033	-0.074	-0.026	-0.021	0.056	0.053	0.219*	0.196*	0.129*	0.063	0.009	0.067	0.579*	0.615*	1

* Significant at 1%

Table 14: Export Openness of downstream manufacturing sectors - All Sectors. Without Lombardia

VARIABLES	All	Europe			Extra-Europe			Extra-Europe High		
LP	0.031	0.025	0.025	0.02	0.006	0.001	0.007	-0.005	-0.009	-0.002
	[0.051]	[0.063]	[0.063]	[0.062]	[0.037]	[0.038]	[0.040]	[0.045]	[0.047]	[0.049]
age	0.020***	0.015**	0.015**	0.016**	0.020**	0.021**	0.020**	0.009	0.013	0.009
	[0.007]	[0.007]	[0.008]	[0.007]	[0.008]	[0.008]	[0.008]	[0.011]	[0.012]	[0.011]
age^2	-0.000**	-0.000*	-0.000*	-0.000*	-0.000**	-0.000**	-0.000*	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.421	0.323	0.335	0.323	0.45	0.492	0.41	0.335	0.328	0.298
	[0.362]	[0.348]	[0.350]	[0.351]	[0.484]	[0.490]	[0.508]	[0.545]	[0.608]	[0.548]
Lab^2	-0.059	-0.046	-0.048	-0.046	-0.067	-0.072	-0.061	-0.049	-0.047	-0.043
	[0.049]	[0.046]	[0.046]	[0.046]	[0.058]	[0.058]	[0.061]	[0.062]	[0.070]	[0.062]
$FDIOFF$	0.612***	0.429*	0.435*	0.440*	0.405*	0.440*	0.402	0.212	0.223	0.187
	[0.191]	[0.249]	[0.251]	[0.246]	[0.240]	[0.236]	[0.244]	[0.242]	[0.264]	[0.250]
$Group$	0.034	0.16	0.159	0.159	0.059	0.061	0.059	-0.01	0.008	-0.024
	[0.140]	[0.132]	[0.132]	[0.130]	[0.154]	[0.152]	[0.154]	[0.170]	[0.182]	[0.169]
$Sale_{nat}$	0.043***	0.041***	0.041***	0.041***	0.046***	0.045***	0.046***	0.038***	0.038***	0.038***
	[0.004]	[0.006]	[0.006]	[0.006]	[0.008]	[0.008]	[0.008]	[0.008]	[0.009]	[0.008]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.324***	0.227**	0.228**	0.235**	0.306*	0.320*	0.326*	0.282*	0.276	0.297*
	[0.083]	[0.098]	[0.098]	[0.098]	[0.164]	[0.167]	[0.174]	[0.163]	[0.175]	[0.166]
$Sell_{SMEs}$	-0.220***	-0.131	-0.132	-0.127	-0.253**	-0.258**	-0.234**	-0.201**	-0.165	-0.192**
	[0.077]	[0.084]	[0.084]	[0.086]	[0.106]	[0.106]	[0.107]	[0.093]	[0.103]	[0.095]
$Inno_{serv}$	0.035	0.006	0.005	0.014	0.197**	0.201**	0.215**	-0.067	-0.05	-0.055
	[0.066]	[0.061]	[0.060]	[0.062]	[0.082]	[0.082]	[0.087]	[0.157]	[0.162]	[0.164]
$Inno_{proc}$	0.033	0.116	0.117	0.116	-0.261*	-0.265*	-0.266*	-0.227	-0.257	-0.22
	[0.170]	[0.154]	[0.154]	[0.155]	[0.153]	[0.152]	[0.157]	[0.269]	[0.290]	[0.272]
LP^m_{reg}	0.77	0.555	0.526	0.314	0.435	-0.114	0.476	-0.748	-1.895*	-0.451
	[0.554]	[0.503]	[0.518]	[0.449]	[0.934]	[0.892]	[0.640]	[1.271]	[1.109]	[1.086]
Exp^{back}_{reg}	0.014	0.018			0.02			0.013		
	[0.014]	[0.014]			[0.025]			[0.028]		
$ExpEURO^{back}_{reg}$			0.015			-0.014				
			[0.016]			[0.023]				
$ExpEX^{back}_{reg}$				0.046			0.165***			
				[0.036]			[0.054]			
$ExpEXhigh^{back}_{reg}$									0.523***	
									[0.170]	
$ExpEXlow^{back}_{reg}$										0.143
										[0.111]
Const.	-5.767***	-4.946**	-4.634**	-3.789*	-4.997	-2.4	-5.457**	-0.038	2.603	-1.927
	[2.157]	[2.006]	[2.134]	[1.960]	[3.805]	[3.664]	[2.559]	[4.905]	[3.777]	[3.815]
Obs.	869	869	869	869	855[a]	855[a]	855[a]	853[b]	853[b]	853[b]
Pseudo-R2	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Log-likelihood	-146.5	-146.5	-146.5	-146.5	-146.5	-146.5	-146.5	-146.5	-146.5	-146.5

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] The drop of observations is because some sector and area dummies predict export status perfectly.

Table 15: Export Openness of downstream manufacturing sectors - KIBS. Without Lombardia

VARIABLES	All	Europe			Extra-Europe			Extra-Europe High		
LP	0.027	0.038	0.04	0.034	0.011	0.01	0.011	0.159**	0.145*	0.162**
	[0.084]	[0.095]	[0.097]	[0.092]	[0.077]	[0.077]	[0.077]	[0.073]	[0.080]	[0.070]
age	-0.021	-0.021	-0.021	-0.021	-0.005	-0.005	-0.004	-0.01	-0.011	-0.013
	[0.026]	[0.022]	[0.022]	[0.022]	[0.034]	[0.033]	[0.034]	[0.043]	[0.046]	[0.043]
age^2	0.001	0.001	0.001	0.001	0	0	0	0	0.001	0
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lab	0.574	0.25	0.255	0.238	0.669	0.662	0.677	0.605	0.689	0.577
	[0.391]	[0.398]	[0.394]	[0.399]	[0.679]	[0.679]	[0.685]	[0.781]	[0.849]	[0.761]
Lab^2	-0.073	-0.036	-0.037	-0.035	-0.099	-0.098	-0.101	-0.08	-0.092	-0.077
	[0.054]	[0.053]	[0.052]	[0.053]	[0.084]	[0.084]	[0.085]	[0.092]	[0.102]	[0.089]
$FDIOFF$	0.598***	0.329	0.325	0.356	0.408	0.411	0.431	-0.23	-0.167	-0.218
	[0.201]	[0.289]	[0.294]	[0.295]	[0.316]	[0.312]	[0.327]	[0.410]	[0.473]	[0.413]
$Group$	0.063	0.237	0.237	0.234	-0.058	-0.059	-0.057	-0.003	0.026	-0.015
	[0.203]	[0.213]	[0.215]	[0.212]	[0.177]	[0.178]	[0.174]	[0.235]	[0.224]	[0.240]
$Sale_{nat}$	0.046***	0.041***	0.041***	0.040***	0.045***	0.045***	0.044***	0.042***	0.042***	0.041***
	[0.006]	[0.007]	[0.007]	[0.007]	[0.013]	[0.013]	[0.013]	[0.013]	[0.012]	[0.013]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.493***	0.379**	0.374**	0.389**	0.739***	0.736***	0.756***	0.925***	0.998***	0.926***
	[0.135]	[0.173]	[0.173]	[0.172]	[0.245]	[0.243]	[0.246]	[0.316]	[0.333]	[0.316]
$Sell_{SMEs}$	-0.347**	-0.209	-0.207	-0.221	-0.491***	-0.494***	-0.494***	-0.467**	-0.443**	-0.488**
	[0.149]	[0.164]	[0.164]	[0.166]	[0.169]	[0.169]	[0.171]	[0.206]	[0.220]	[0.210]
$Inno_{serv}$	-0.172	-0.173	-0.181	-0.15	-0.046	-0.04	-0.031	-0.354*	-0.375*	-0.321*
	[0.122]	[0.136]	[0.136]	[0.134]	[0.158]	[0.156]	[0.156]	[0.206]	[0.221]	[0.187]
$Inno_{proc}$	0.175	0.231	0.234	0.229	0.014	0.014	0.015	0.021	-0.016	0.038
	[0.212]	[0.223]	[0.224]	[0.226]	[0.229]	[0.229]	[0.231]	[0.401]	[0.414]	[0.402]
LP^m_{reg}	1.690**	0.746	0.919	0.426	2.282**	2.162**	2.130**	1.008	-0.639	1.157
	[0.668]	[0.625]	[0.710]	[0.505]	[0.924]	[0.896]	[0.891]	[0.832]	[1.005]	[0.952]
Exp^{back}_{reg}	-0.103	-0.145	-0.141	-0.05	0.18	0.263**	0.135	0.092	-0.062	0.208
	[0.147]	[0.106]	[0.115]	[0.111]	[0.117]	[0.126]	[0.119]	[0.227]	[0.195]	[0.217]
$ExpEURO^{back}_{reg}$	0.025	0.028**			0.016			0.025		
	[0.016]	[0.013]			[0.012]			[0.032]		
$ExpEX^{back}_{reg}$			0.038*			0.007				
			[0.020]			[0.018]				
$ExpEXhigh^{back}_{reg}$				0.057			0.082***			
				[0.037]			[0.027]			
$ExpEXlow^{back}_{reg}$									0.356***	
									[0.087]	
Const.										0.095
										[0.112]
	-9.399***	-5.593**	-6.283**	-4.194**	-11.995***	-11.320***	-11.716***	-7.752**	-1.797	-8.491**
Obs.	[2.771]	[2.686]	[3.027]	[2.012]	[3.624]	[3.570]	[3.325]	[3.446]	[2.969]	[3.580]
Pseudo-R2										
Log-likelihood	453	453	453	453	453	453	453	344[b]	344[b]	344[b]
Pseudo-R2	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245
Log-likelihood	-59.66	-59.66	-59.66	-59.66	-59.66	-59.66	-59.66	-59.66	-59.66	-59.66

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] The drop of observations is because some sector and area dummies predict export status perfectly.

Table 16: Market Thickness of downstream manufacturing sectors - All Sectors. Without Lombardia

VARIABLES	All	Europe	Extra-Europe	Extra-Europe High
LP	0.026	0.019	-0.004	-0.013
	[0.051]	[0.062]	[0.042]	[0.043]
age	0.020***	0.015**	0.019**	0.009
	[0.007]	[0.007]	[0.008]	[0.011]
age^2	-0.000***	-0.000*	-0.000*	0
	[0.000]	[0.000]	[0.000]	[0.000]
Lab	0.438	0.344	0.52	0.405
	[0.361]	[0.355]	[0.512]	[0.584]
Lab^2	-0.061	-0.049	-0.076	-0.058
	[0.049]	[0.047]	[0.061]	[0.067]
$FDIOFF$	0.620***	0.443*	0.439*	0.227
	[0.190]	[0.247]	[0.242]	[0.230]
$Group$	0.037	0.163	0.07	-0.014
	[0.140]	[0.131]	[0.154]	[0.172]
$Sale_{nat}$	0.043***	0.040***	0.046***	0.038***
	[0.004]	[0.006]	[0.008]	[0.009]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.328***	0.232**	0.305*	0.278
	[0.082]	[0.097]	[0.174]	[0.170]
$Sell_{SMEs}$	-0.219***	-0.128	-0.254**	-0.206**
	[0.079]	[0.086]	[0.114]	[0.099]
$Inno_{serv}$	0.043	0.017	0.234**	-0.034
	[0.066]	[0.060]	[0.099]	[0.172]
$Inno_{proc}$	0.025	0.106	-0.311*	-0.277
	[0.172]	[0.156]	[0.167]	[0.287]
LP^m_{reg}	0.536	0.241	-0.16	-1.37
	[0.581]	[0.543]	[0.698]	[1.018]
N^{back}_{reg}	0.073	0.093*	0.466***	0.523**
	[0.058]	[0.054]	[0.123]	[0.230]
Const.	-5.281**	-4.261**	-5.892**	-1.976
	[2.274]	[2.081]	[2.677]	[3.649]
Obs.	869	869	855	853
Pseudo-R2	0.199	0.199	0.199	0.199
Log-likelihood	-152.5	-152.5	-152.5	-152.5

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] See the note of Table 8.

Table 17: Market Thickness of downstream manufacturing sectors - KIBS. Without Lombardia

VARIABLES	All	Europe	Extra-Europe	Extra-Europe High
LP	0.024	0.029	0.005	0.134
	[0.081]	[0.090]	[0.079]	[0.085]
age	-0.02	-0.021	-0.006	-0.016
	[0.026]	[0.022]	[0.032]	[0.043]
age^2	0.001	0.001	0	0.001
	[0.001]	[0.000]	[0.001]	[0.001]
Lab	0.554	0.23	0.681	0.627
	[0.396]	[0.397]	[0.683]	[0.791]
Lab^2	-0.071	-0.035	-0.1	-0.082
	[0.054]	[0.053]	[0.085]	[0.093]
$FDIOFF$	0.622***	0.375	0.433	-0.221
	[0.222]	[0.307]	[0.331]	[0.414]
$Group$	0.066	0.253	-0.048	0.004
	[0.200]	[0.214]	[0.177]	[0.237]
$Sale_{nat}$	0.046***	0.040***	0.044***	0.041***
	[0.007]	[0.007]	[0.013]	[0.013]
$Sale^2_{nat}$	-0.000***	-0.000***	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]
$Sell_{Large}$	0.501***	0.387**	0.733***	0.924***
	[0.134]	[0.174]	[0.244]	[0.327]
$Sell_{SMEs}$	-0.361**	-0.227	-0.498***	-0.472**
	[0.149]	[0.168]	[0.174]	[0.212]
$Inno_{serv}$	-0.151	-0.135	-0.019	-0.307*
	[0.124]	[0.135]	[0.159]	[0.186]
$Inno_{proc}$	0.173	0.215	-0.002	0.001
	[0.217]	[0.239]	[0.232]	[0.396]
LP^m_{reg}	1.461**	0.355	1.945**	0.342
	[0.629]	[0.501]	[0.887]	[0.860]
N^{back}_{reg}	0.013	0.112	0.102	0.236
	[0.069]	[0.090]	[0.066]	[0.153]
Const.	-8.069***	-4.251**	-11.093***	-6.258**
	[2.573]	[2.124]	[3.493]	[3.013]
Obs.	453	453	453	344
Pseudo-R2	0.218	0.218	0.218	0.218
Log-likelihood	-61.85	-61.85	-61.85	-61.85

Robust Standard errors in brackets are clustered by region.
Area and Sector Dummies are included in every regressions.
[a] [b] See the note of Table 9.