Do Business Services matter for Innovation, Productivity, and Exports? Morocco's Manufacturing Sector Story

Achy, Lahcen and Basri, Amine

National Institute of Statistics and Applied Economics (Morocco)

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Lahcen Achy[1] and Amine Basri

Abstract

Business services have been overlooked in explaining observed variability in firms' productive performance and their propensity to innovate, and export. This paper contributes to the scarce empirical literature on the issue using Morocco's manufacturing sector firm level data. Three conclusions emerge from the paper. First, less than one Moroccan manufacturing firm out of five has already benefited from business services. Those firms that never used business services either don't perceive the benefits they can spark, or they see them but can't afford the cost involved. Second, firms using business services tend to be more likely to engage in innovative activities. Third, demand on business services tend to be negatively associated with the likelihood to be involved in export activity. One would expect that the use of business services improves firms' competitiveness. Many Morocco's exporting firms, however, operate in the garment sector and their activities tend to be confined to subcontracting for foreign suppliers.

Key words: Business Services, Manufacturing Firms, Innovation, Exports, Developing Countries
JEL Classification : L25, L06, O14

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1. Introduction

Business services have for a long time been overlooked in explaining observed variability in firms' productive performance and their propensity to innovate, and export. Yet, there are compelling reasons to presume that business services such as consultancy management services, legal services, engineering services, technology development and transfer services, and training services, would have an important role in driving firms' innovation, productivity, and competitiveness. One reason for such oversight could be due to the paucity of firm level data on the extent of their utilization. This paper contributes to the scarce empirical literature on the issue, especially in developing countries, using Morocco's manufacturing sector firm level data drawn from "Firm Analysis and Competitiveness Survey" – (FACS) conducted by the Ministry of Commerce and Industry and the World Bank. The survey provides data on manufacturing firms' propensity to engage in product and process innovation as well as their demand on four categories of business services: management training, technical training, management consulting, and technical consulting. The empirical part of the paper uses appropriate estimation techniques to assess the impact of business services, for which data are provided in the survey, on firms' innovative behavior, their productivity level, and their export orientation.

Three key conclusions emerge from the paper. First, less than one Moroccan manufacturing firm out of five has already benefited from business services. Those firms that never used business services either don't perceive the benefits they can spark, or they see them but can't afford the cost involved. Second, econometric estimates corroborate the common wisdom, namely that firms using business services tend to, ceteris paribus, be more likely to engage in innovative activities. Such finding applies to both product and process innovations. Third, surprisingly, our estimates indicate that the demand on business services tend to be negatively associated with the likelihood to be involved in export activity. One would expect that the use of business services improves firms' competitiveness and increases their chances to compete on foreign markets. Many Morocco's exporting firms, however, operate in the garment sector and their activities tend to be confined to subcontracting for foreign suppliers. Those findings appear to be in line with Fafchamps et al. (2008) who also argued that there is little evidence that productivity learning is what enables firms to export. It reinforces the presumption that Morocco's manufacturing sector continues to suffer from structural weaknesses stemming from its excessive specialization in a few industries that are either natural resource based or use intensive unskilled labor (Achy (2013)).

From a public policy perspective, two preliminary insights need to be highlighted. First, on the demand-side, there is a significant proportion of manufacturing firms that miss the potential benefits of business services and the impact they may trigger both on their current performance and potential medium to term growth. The government role remains decisive in supporting access to business services that most small and medium enterprises (SMEs) can't manage to pay on their own. The government can also mitigate quality-related information asymmetry as most SMEs may find it challenging to properly assess services put forward by business services' providers. Second, from the supply-side standpoint, streamlining regulations that affect the performance of business services could be of immense policy interest. Those services are valuable on their own but can also generate significant spillovers both on client industries and on the overall economic growth.

The rest of the paper is organized as follows. Section two provides an overview of the literature. The third section presents the FACS survey and descriptive analysis of business services-related variables. Section four is devoted to econometric analysis. Finally, section five concludes with key insights and relevant policy implications.

2. Literature review.

The pioneering studies on the impact of business services on firms started in the sixties of the twentieth century, with Machlup (1962) and Greenfield (1966). However, the first scholar publications that characterize business services, and more concretely knowledge-intensive business services (KIBS), emerged in the mid-nineties. Since then, several terms have been coined to delineate and categorize business services. In a comprehensive review of the KIBS related literature, Nählinder (2005) identified a dozen of overlapping categories among which: business services, professional business services, strategic knowledge intensive business services, production-oriented services, information and knowledge services, knowledge-based services, and knowledge intensive services.

The European Commission (1999) noticed that business services sector achieved high growth rates in value added and employment and pointed out to its critical importance for firms' growth and competitiveness. The EC advocated that the business services sector deserves stronger political attention. Accordingly, a key component in the European competitiveness policy was to promote intangible investments including knowledge creation, quality, innovation, and management, all of which require an intensive utilization of business services.

Rubalcaba-Bermejo (1999) defines business services as activities that are real not financial and have an impact of firms' competitiveness through their use as intermediary inputs in the value chain, and via quality and innovation gains that result from the interaction between suppliers, clients, and services. One must acknowledge that business services are heterogeneous and not all of them have a direct influence on firms' competitiveness or innovation. To overcome such issues, researchers turned their attention to a sub-group of business services, those that could be classified as "knowledge-intensive". Legal services, engineering services, consulting and accounting services are examples of such services. Hipp (2000) highlighted that KIBS are characterized by their ability to receive information from outside the company and transform it in combination with firm-specific knowledge, into useful services for customers. Muller (2001) pointed out that KIBS can be described as firms performing, mainly for other firms, services that embody a high intellectual value-added. A much broader definition of KIBS was provided by Miles et al. (1995) as it encompasses all economic activities intended to result in the creation, accumulation, or dissemination of knowledge. Such activities share three main features: their heavy reliance on professional knowledge; can be primary sources of knowledge such as reports or specific trainings or can support knowledge to produce intermediary services for their clients; and they can lead to a competitive advantage.

Empirically, the definition of business services has been more complex to implement due to the insufficient level of detail on those services in available data on firms. Eurostat, for instance, defines business services as composed of computer and related activities, legal, accounting, book-keeping and auditing activities, tax consultancy, market research and public opinion polling,

business management consultancy, architectural and engineering activities, and related technical consultancy, technical testing and analysis, advertising and labor recruitment and provision of personnel.

Miles et al. (1995) use different classifications that capture the higher or lower knowledge intensity of service activities. Knowledge-intensive high-tech services consist of post and tele-communications, computer and related activities, and research and development. Knowledge-intensive market services comprise water transport; air transport; real estate activities; renting of machinery and equipment without operator, and of personal and household goods; other business activities. Knowledge-intensive financial services are made of financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; activities auxiliary to financial intermediation. Finally, Other knowledge-intensive services cover education; health and social work; recreational, cultural, and sporting activities.

One of the major features of KIBS is co-production, which means that the customer tends to participate in the provision of the service. Bitner et al. (1997) differentiate three levels of client participation: low, moderate, and high. They classify the co-production level in advertising services as medium because "consumers inputs are essential to help the service organization in creating the service. In other KIBS the participation level is high as customers are expected to have important production roles that, if not fulfilled, can affect the nature of the service outcome.

Bettencourt et al. (2002) insists on the role of a good relationship between clients and KIBS providers for service performance. They identify seven features of the clients´ behavior that influence KIBS performance: communication openness, shared problem solving, tolerance, accommodation, advocacy, involvement in project governance and personal dedication. These features of the clients' behavior strongly affect the outcome. Their contribution emphasizes that firms can achieve substantial gains by actively cooperating with KIBS firms in the provision of services. Being opened and tolerant, firms can acquire new knowledge that they can incorporate in their production processes or even use it for developing product or process innovations. Thus, co-production involves, in most of the cases, mutual learning between providers and clients. To sum up, use of KIBS goes beyond the provision of a particular service and lead to spillovers on innovativeness, productivity and potentially on export capacity.

Empirically, due to limited data, statistical methods used to examine the role of KIBS in innovation and productivity using micro data tend to be relatively simple. Several papers focus on unravelling the patterns of innovation in KIBS and the characteristics of productivity in these activities. In most cases, no attention is paid to their impact on other activities. Freel (2006) uses a microdata drawn from "survey of enterprises in Northern Britain" which provides valid responses from 597 manufacturing firms and 748 business service firms. The sample employed in his analysis consist of 563 small KIBS firms, classified following Miles et al. (1995) into technology based KIBS (t-KIBS) and professional KIBS (p-KIBS). Using an ordered Logit estimation method, the findings show the existence of a positive relationship between the share of high-qualified workers and the innovativeness in t-KIBS firms as well as the importance of customer and supplier cooperation in the innovation process. Leiponen (2005) uses data from 167 Finnish KIBS firms collected through a mail survey carried out by the Research Institute of the Finnish Economy. The paper uses factor analysis as well as Probit and Tobit estimation and concludes that highly qualified personnel plays

an important role in innovation in combination with external knowledge sourcing from clients and competitors.

Cainelli et al. (2006) examine the two-way relationship between innovation and economic performance in services using a longitudinal firm-level dataset. They revealed the presence of a feedback mechanism from innovation to performance. Innovating firms tend to achieve better productivity and growth results, and, concomitantly firms with higher productivity tend to spend more than average on innovation. Accordingly, productivity is associated not only with the presence of innovation, but also with the level of financial commitment to innovation and the nature of innovation activities performed. Mansury and Love (2008) relate the economic performance of US business services' firms to their innovation outputs and external linkages, conditional on a set of internal resources and other firm characteristics that can affect performance. Information was collected via a mail questionnaire from 206 firms. Descriptive analysis revealed that innovators tend to have higher productivity, sales' growth and employment growth compared to non-innovators. They also found that the presence of service innovation produces a positive effect on growth but can't uncover any significant effect on productivity.

3. Data and descriptive analysis

The paper uses data from two firm level databases. The first is the annual survey conducted by Ministry of Commerce and Industry on all manufacturing firms with at least 10 employees or that have an annual turnover higher than 100,000 dirhams (approximately US$ 10 000). This survey collects firm level data on a set of variables including turnover, output, value added, exports, investment, gross labor cost, and the number of permanent and temporary employees. The second is based on "Firm Analysis and Competitiveness Survey" – (FACS)[2] by the Ministry of Commerce and Industry and the World Bank on a randomly selected sample of 850 firms. Seven most important industries in Morocco are covered: food processing, textiles, garments, leather, electrical machinery, chemicals, and plastics. It provides detailed data on the skill composition of the manufacturing sector labor force, on technology, innovation, and other related variables. The FACS also covers business services such as firms' demand for technical and managerial services, and their use of information and communication technologies. The same identification code is used in both surveys. This important feature allows to match data drawn from both surveys and construct estimates of total factor productivity used in the econometric analysis.

The FACS provides data on information and communication technology (ICT) use by the Moroccan manufacturing firms (MMF), their propensity to engage in innovation and their demand for business services. As portrayed in the first panel of table 1, 70 percent have an internet subscription of which 80 percent regularly use emails to communicate with their clients and suppliers. However, only 12 percent of employees use computers in their work, and 17 percent of firms have a corporate website. Therefore, the room for improving technology adoption among manufacturing firms in Morocco is substantial. When asked to compare their technological status to their competitors, almost three out of four think their status is like that of their competitors; 17

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[2] The survey was conducted in 2004 and data released in 2006. As more recent data are now available, the paper can serve as a basis for comparison.

percent think they are more advanced and only 10 percent acknowledge they have a gap with their competitors.

Regarding innovation, the second panel of table 1 indicates that less than 10 percent of firms have an ISO certification and only around 5 percent use a technology under a foreign license. However, almost 45 percent of manufacturing firms declared that they are engaged in product innovation and 35 percent in process innovation. Product innovation is mostly carried out internally except for 17 percent of firms which developed new product lines in collaboration their clients, 5 percent with their suppliers and only 1 percent with universities. The latter figure shows that cooperation between universities and firms in innovation and R&D in Morocco is extremely rare.

As far as business services are concerned, the third panel of table 1 presents data on four categories of business services: management training, technical training, management consulting, and technical consulting. Most firms do not use business services: 16 percent have already benefited from technical training and 14 percent used management training. The demand for consultancy services both technical and managerial tends to be even lower: 8 and 6 percent respectively. Surprisingly, three quarters of firms that never used business services do not perceive the value of doing so. On the other hand, 17 percent of firms recognize the potential gains that business services can bring about; but seem unable to afford them. There seems to be a significant proportion of firms that miss the potential benefits of business services and spillovers they are likely to have on their performance. For instance, more than three out of four Spanish firms used different types of business services during a comparable period (Camacho et al. (2009).

The government support can be critical in facilitating access to those services that are usually costly for small and medium enterprises (SMEs). More than 90 percent of manufacturing firms are SMEs with less than 200 employees. On the other hand, large firms represent no more than 8 percent of the total number of firms, yet their sales amount to 63 percent of total manufacturing sales, their value-added 70 percent, and their exports 72 percent.

Manufacturing firms demand business services for three reasons: conduct an organizational change, improve productivity, and support their efforts to comply with specific market requirements. The importance of each of the motivations differs depending on the type of services. The goal of firms using "management training" services is mainly to achieve organizational change. Demand on technical training services is mainly geared towards productivity improvement. The same applies to technical consulting. Finally, firms that open their doors to management consultants claim that their aim is to facilitate organizational change, improve their productivity and, by the same token, comply with market requirements.

Table 1. Business services in Morocco's Manufacturing Firms

Panel 1. Technological status	
Use of computers and Internet	**Percentage**
Share of employees using computers in their work	12
Share of firms with Internet subscription	70
Among which use emails with clients and suppliers	79
Share of firms with corporate website	17
Technological advance compared to competitors	
Less advanced technology	10
More advanced technology	17
Comparable technology	73
Total	100
Panel 2. Forms of innovation activities	
Share of firms with ISO certification	10
Share of firms using technology under foreign license	5
Share of firms involved in product innovation	45
Share of firms involved in process innovation	35
Share of firms that developed a new product line	
With a client	17
With a supplier	5
With a national university or college	1
Panel 3. Nature of business services and reasons for its utilization	
Share of firms that have used business services	
Management training	14
Technical training	16
Management consulting	6
Technical consulting	8
Main reason s for not using services	
No feeling the need	74
Financial constraints	17
Other reasons	9
Main objectives for using business services	
Management training	
Organizational change	43
Productivity improvement	19
Comply with market requirements (standards)	15
Other	23
Technical training	
Organizational change	15
Productivity improvement	41
Comply with market requirements	18
Other	26
Management consulting	
Organizational change	29
Productivity improvement	27
Comply with market requirements	27
Other	17
Technical consulting	
Organizational change	15
Productivity improvement	32
Comply with market requirements	23
Other	30

Source: FACS survey (Ministry of Commerce and Industry and the World Bank)

4. Econometric analysis

The purpose of the econometric analysis is to test whether business services, as defined earlier and based on available data collected under FACS, have a significant impact on firms' performance. More specifically, this section explores whether demand on business services exert any palpable effect on three dimensions of firms' performance: i) firms' engagement in innovation activities; ii) firms' productivity, and iii) firms' competitiveness proxied by their export orientation.

Similar explanatory variables are broadly incorporated in the three econometric models. First, each model comprises proxies for the use of business services labeled as follows: management training services (MTS), technical training services (TTS), management consulting services (MCS) and technical consulting services (TCS). We also introduce the variable (CSTT) that stands for the use of consulting services for technology transfer. Additional variables are considered in each of the models to control for firm's size, firms' ownership by foreign capital and sectoral dummies.

Based on the literature review, one would anticipate that demand for business services would positively correlate with higher productivity and stronger export-orientation. It would also enhance the firm's likelihood to innovate. In the same vein, firm's size would matter as well as foreign ownership. For instance, one would expect large firms to demand more business services and be able to pay for them. Foreign ownership, on the other hand, might increase productivity, foreign market penetration and stimulate innovation. Table 2 reports a detailed description of the variables included in the econometric analysis.

To examine the potential impact of using business services on the innovative behavior of the Moroccan manufacturing firms, two proxies for innovation are used. The first one is "product innovation" and the second is "process innovation". Product innovation relates to an upgrade in the product either by improving the performance of an existing feature or by adding a new advanced feature. Process innovation, on the other hand, stands for a reorganization of the production process, which could entail adjustments throughout the value chain. In general, process innovation leads to cost saving.

Table 2. Variables included in the econometric model

Variable	Description
Innovation 1	Binary variable = 1 if the firm engages in product innovation; 0 otherwise
Innovation 2	Binary variable = 1 if the firm engages in process innovation; 0 otherwise
TFP1	Total Factor Productivity based on book value of tangible assets
TFP2	Total Factor Productivity based on market value of tangible assets
MTS	Binary variable = 1 if the firm uses management training services; 0 otherwise
TTS	Binary variable = 1 if the firm uses technical training services; 0 otherwise
MCS	Binary variable = 1 if firm uses management consulting services; 0 otherwise
TCS	Binary variable = 1 if firm uses technical consulting services; 0 otherwise
CSTT	Binary variable = 1 if firm uses consulting services for tech transfer; 0 otherwise
Size (employ)	Logarithm of the number of employees
Medium	Binary variable = 1 if the firm size is medium (50 to 199 emp.); 0 otherwise
Large	Binary variable = 1 if the firm size is large (more than 200 emp.); 0 otherwise
Foreign K	Share of foreign capital in the firm's social capital
Export status	Binary variable =1 if the firm exports; 0 otherwise
Export share	Share of exports in the firm's total sales

4.1. Impact of business services on firms' innovation

In both cases the innovation proxy, that stands for the dependent variable Y, is binary. The dependent variable takes the value 1 if the firm engage in innovation and the value 0 otherwise. In this case, econometric estimation can be performed using binary outcome models (*probit* or *logit*). In such models, the dependent variable Y is a nonlinear function of the regressors X and thus the coefficients on explanatory variables have no straightforward interpretation. Odds-ratios, which measure the probability that the dependent variable Y=1 relative to the probability Y=0, are usually used instead. Since both binary outcome models (*probit* or *logit*) produce similar results[3], only *probit* models are used in the rest of the paper.

The estimation results are shown in table 3. For each explanatory variable, two values are reported: the estimated coefficient, and the odds ratio in bold. Whenever the odds ratio is greater than (lower than) 1 it means that specific explanatory variable increases (decreases) the likelihood of the firm engaging in innovation. If odds ratio is equal to 1, this means that the explanatory variable has no effect on the firm's likelihood to engage in innovation.

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[3] The two models produce different coefficients, but the magnitude of coefficients can't be interpreted anyway. Both models, however, have almost similar marginal effects and odds-ratios.

Table 3. Probit estimation of the impact of business services on firms' innovation

Dependent	Innovation 1				Innovation 2			
Explanatory	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
MTS	0.51*	0.55**	0.58*	0.68**	0.34*	0.39*	0.32	0.40*
	1.66	**1.74**	**1.80**	**1.99**	**1.41**	**1.47**	**1.37**	**1.49**
TTS	0.52**	0.71**	0.56**	0.74**	0.31	0.42*	0.32	0.41*
	1.69	**2.04**	**1.76**	**2.11**	**1.36**	**1.52**	**1.37**	**1.51**
MCS	0.20	0.28	0.10	0.16	-0.21	-0.15	-0.28	-0.23
	1.22	**1.32**	**1.10**	**1.17**	**0.80**	**0.85**	**0.75**	**0.79**
TCS	0.16	0.13	0.04	0.02	1.00**	0.99**	1.01**	0.99**
	1.17	**1.14**	**1.04**	**1.02**	**2.74**	**2.68**	**2.75**	**2.68**
CSTT	1.94***	1.95***	1.86***	1.86***	1.17***	1.22***	1.16***	1.19***
	6.97	**7.01**	**6.47**	**6.46**	**3.22**	**3.38**	**3.18**	**3.28**
Size (employ)	0.53***		0.52***		0.28***		0.28***	
	1.69		**1.69**		**1.32**		**1.32**	
Size dummies								
Medium		0.69***		0.62***		0.35**		0.27*
		2.0		**1.85**		**1.41**		**1.30**
Large		1.05***		0.99***		0.51**		0.52**
		2.86		**2.70**		**1.67**		**1.68**
Foreign capital			0.02	0.002			0.001	0.001
			1.00	**1.00**			**1.00**	**1.00**
Export status			0.42**	0.53**			0.19	0.27
			1.52	**1.71**			**1.21**	**1.31**
Sectoral dummies	NO	NO	YES	YES	NO	NO	YES	YES
Number of obs.	832	832	821	821	832	832	832	832
Pseudo-R^2	0.15	0.13	0.17	0.15	0.09	0.08	0.08	0.11

Note: Innovation 1 refers to product innovation and Innovation 2 refers to process innovation. *** (** or *) indicate that the coefficient is significant at the 1% (5% or 10%) level. For each explanatory variable, two values are reported: the estimated coefficient, and the odds ratio. The latter is in bold.

Estimates show that, under mode1 1, the odds of product innovation is 1.66 times higher for firms using managerial training services (MTS) and 1.69 time higher for those technical training services (TTS) compared to those that don't use such services. All being equal, firms that invest in training services improve the skills of their workforce, which seems to exert a direct impact on their likelihood to innovate. This general finding is confirmed in all models specified in table 3 and tends to be stronger for product innovation compared to process innovation.

Paradoxically, consulting services (MCS and TCS) appear to interact differently with the likelihood to carry out innovation activities. MCS tend to increase the likelihood of product innovation but decrease the likelihood of process innovation. Technical consulting services (TCS) seems, on the other hand, strongly associated with process innovation. The odds of engaging in that form of innovation tend to more than twice as high in firms that benefited from TCS. The latter finding is robust to the inclusion of sectoral dummies. Finally, consulting services for technology transfer (CSTT) emerge as one of the most important factors that increase the likelihood of Moroccan manufacturing firms to perform innovative activities.

The econometric estimates confirm, as anticipated, the critical role of firms' size in driving their innovation behavior. The size effect is statistically significant and tends to be larger for product innovation compared to process innovation. There is also a clear association between export-orientation and the likelihood to engage in innovation. The likelihood seems higher for product innovation but does not appear to be statistically significant for process innovation. Finally, foreign ownership of capital does not appear to have any statistically significant effect on firms' likelihood to engage in innovation.

4.2. Impact of business services on firms' productivity

To assess the impact of business services on productivity, we need first to construct an adequate proxy for productivity. A simple measure of firm's productivity could be its labor productivity, which can be calculated by dividing the firms' value added by the adjusted number of full-time equivalent employees. This measure has the advantage of simplicity and immunity from errors and discrepancies associated with measurement of the capital stock. However, as different industries have different capital intensities, labor productivity tends to be misleading[4].

The paper suggests an estimate of total factor productivity (TFP) at the firm level. TFP controls for both capital and labor and thus has the potential to describe the productive efficiency more accurately than labor productivity. There is, however, no single best measure for TFP. Comparative advantage of each measure depends on the question at hand. This paper uses two different estimates of TFP. The first calculates the capital stock using the book value of the firm's fixed tangible assets. The second uses an estimate of market value of capital provided in the survey. Book value and market value of capital stock are generally different for several reasons: accounting life is not the same as the economic life, the linear depreciation method typically used by firms differs from the true pattern of economic depreciation and finally price movements of assets are usually overlooked under the book value approach.

Table 4 provide linear regression estimates of effects on both measures of TFP. The variables included in the estimations are those referring to the use of business services as previously described, export status and the presence of foreign ownership of firm's capital. The first panel (model 1 to model 4) uses TFP based on book value of capital as the dependent variable. Model 1 accounts only for business services proxies, Model 2 adds the firm's export status and the presence of foreign ownership in its capital. The third and the fourth model replicate Model 1 and 2, respectively, and control for sectoral dummies.

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[4] Kinda et al. (2009) provide an overview of productivity estimation methods and apply them to firm-level data in selected Middle East and North African countries including Morocco.

Table 4. Estimation of the impact of business services on firms' productivity in Morocco

Dependent		TFP 1				TFP 2		
Explanatory	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
MTS	0.47**	0.39**	0.28**	0.28**	0.67**	0.54**	0.39**	0.38**
	(3.98)	(3.33)	(2.28)	(2.61)	(5.30)	(4.46)	(3.69)	(3.46)
TTS	0.06	0.07	0.004	0.005	-0.05	-0.03	-0.07	-0.07
	(0.59)	(0.78)	(0.04)	(0.06)	(-0.51)	(-0.27)	(-0.82)	(-0.78)
MCS	0.14	0.11	0.06	0.07	0.27	0.19	0.09	0.08
	(0.69)	(0.52)	(0.32)	(0.37)	(1.30)	(0.98)	(0.56)	(0.52)
TCS	-0.24	-0.20	-0.22	-0.21	-0.25	-0.18	-0.19	-0.18
	(-1.20)	(-1.03)	(-1.22)	(-1.17)	(-1.30)	(-0.91)	(-1.12)	(-1.07)
CSTT	0.21**	0.22**	0.10	0.11	0.21**	0.23**	0.08	0.09
	(2.06)	(2.36)	(0.89)	(1.20)	(2.03)	(2.53)	(0.98)	(1.03)
Export-Status		-0.27**		-0.02		-0.46**		-0.06
		(-4.02)		(-0.37)		(-6.60)		(-0.91)
Foreign capital		0.001		-0.0003		0.001		-0.004
		(1.14)		(-0.40)		(1.16)		(-0.58)
Number of obs.	813	813	813	813	808	808	808	808
Sectoral dummies	No	No	Yes	Yes	No	No	Yes	Yes

Note: **TFP 1** refers to Total Factor Productivity based on book value of tangible assets, and **TFP 2** refers Total Factor Productivity based on market value of tangible assets. *** (** or *) indicate that the coefficient is significant at the 1% (5% or 10%) level. For each explanatory variable, two values are reported: the estimated coefficient, and the t-stat. The latter is between brackets.

Broadly, econometric estimates are quite comparable for both measures of capital[5]. The use of management training services (MTS) appears to have a positive and significant effect on productivity. This econometric result conforms to our expectations. In addition, it is robust to the inclusion other control variables or the sectoral dummies. Curiously, the use of technical training services does not seem to exert any significant effect on TFP. This is particularly surprising when we consider that, in principle, firms' demand on TTS could be mainly driven by the pursuit of productivity improvement. One explanation could be related to TFP measurement errors. It could also mean that managerial skills, embodied in management training services, are much more important in driving TFP than strict technical skills. On the other hand, management and technical consulting services do not seem to have any statistically significant effect on TFP. These results, although unexpected, may be because only a thin minority of Moroccan manufacturing firms is currently using those services. The variable "Consulting services for technology transfer" (CSTT) seems to be statistically significant with the expected sign. However, once sectoral dummies are accounted for in the regression, the variable CSTT tends to lose its statistical significance.

Export status seems to be significant in explaining TFP variability, although with an opposite sign with respect to expectations. A similar apparently counterintuitive result has been found earlier with innovation behavior. It could be explained by the fact many Moroccan firms involved in exports are made by labor intensive firms in garment and leather industries. This presumption seems to be corroborated once the sectoral dummies are incorporated in the regression. As reported

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[5] This is not unusual. For instance, Baily, Charles Hulten, and David Campbell (1992) find that their results on productivity dispersion and evolution do not change significantly when sophisticated measures of capital are used instead of crude measures based on book value.

in Model 4 and Model 8, the coefficient associated with export status fails to be significant. Those findings appear to be in line with Fafchamps et al. (2008) who noted that of all seven industries covered by FACS, the garment industry is the most oriented towards exports. Garment firms export, on average, 80 percent of their output. They also argued that there is little evidence that productivity learning is what enables firms to export. Finally, foreign ownership does not seem to be a significant driver of productivity improvement.

4.3. Impact of business services on firms' exports

To investigate the potential impact of using business services on export orientations of the Moroccan manufacturing firms, two models are suggested. The first is a probit model where the dependent variable is the export status. It takes the value 1 if the firm sells part of its production on foreign markets and the value 0 otherwise. The second is a model uses linear regression where the dependent variable is the share of the firm's exports in its total output. In addition to variables associated with business services, various control variables such as firm's size, its age, the share of foreign ownership and sectoral dummies, are accounted for.

The econometric results are reported in tables 5. The first panel (model 1 to model 4) uses export status binary variable as the dependent variable. For each explanatory variable, two values are reported: the estimated coefficient, and the odds ratio in bold. Whenever the odds ratio is greater than (lower than) 1 it means that specific explanatory variable increases (decreases) the likelihood of the firm engaging in innovation.

Overall, the demand for business services, as defined earlier; tend to reduce the likelihood of exporting. For instance, the odds of exporting roughly three times less for firms using managerial training services (MTS) compared to those that don't use such services. One would expect that the use of business services is a mean to improving the firm's competitiveness and therefore its chances to enter foreign markets. However, in Morocco most exporting firms operate in the garment sector and their activities are mainly confined in subcontracting for foreign suppliers.

As export status is only a dummy variable that does not account for the intensity of export orientation of manufacturing firms, the share of exports in total output is suggested as an alternative explanatory variable in the second panel of table 5 (model 5 to model 8). The same results showing the irrelevance of business services to firms' propensity to export are uncovered.

Turning to the other control variables, the firm's age and size seem to be strongly associated with export operations. Regarding age, all specifications in table 5 reveal that firms' age is negatively related to their propensity to export. In other words, young firms tend to be much more likely to export than old firms. This finding seems to be robust to the inclusion of sectoral dummies and is consistent with Fafchamps et al. (2008) who argued that exporting, in the context of Moroccan manufacturing sector, appears to require little or no learning-by-doing and most firms' operations seem to be set up from the outset to serve either the domestic or the international market.

As far as size is concerned, all regressions indicate that large firms are most likely to engage in exports. This is consistent with the fact that labor intensive industries are much more involved in exports and further reinforces the claim that a cheap and flexible labor force has been a key driver

of manufacturing exports over that period. Finally, the presence of foreign ownership in firms' social capital exert a modest though statistically significant impact on their likelihood to penetrate foreign markets, which could suggest the presence of foreign investors that use Morocco as an export platform.

Table 5. Estimation of the effects of business services on exports in Morocco

	Binary Export Orientation				Share of exports in total Sales			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
MTS	-1.31**	-1.18**	-1.21**	-1.03**	-0.88**	-0.81**	-0.47	-0.40
	0.27	**0.30**	**0.30**	**0.36**	*(-2.43)*	*(-2.31)*	*(-1.02)*	*(-0.90)*
TTS	-0.46	-0.13	0.04	0.25	-0.36	-0.03	0.09	0.42
	0.63	**0.88**	**1.04**	**1.28**	*(-1.08)*	*(-0.09)*	*(0.22)*	*(0.98)*
MCS	-0.41	-0.32	-0.6	-0.57	-0.46	-0.46	-0.56	-0.61
	0.66	**0.73**	**0.55**	**0.57**	*(-0.74)*	*(-0.75)*	*(-0.65)*	*(-0.73)*
TCS	0.21	0.17	-0.005	0.06	0.33	0.25	0.29	0.24
	1.24	**1.18**	**0.99**	**1.06**	*(0.63)*	*(0.49)*	*(0.41)*	*(0.35)*
CSTT	-0.31	-0.29	0.11	0.19	-0.38	-0.39	-0.13	-0.09
	0.73	**0.75**	**1.12**	**1.21**	*(-1.16)*	*(-1.17)*	*(-0.33)*	*(-0.23)*
Firm's Age	-0.09***	-0.09***	-0.07***	-0.07***	-0.08***	-0.08***	-0.06***	-0.06***
	0.90	**0.91**	**0.93**	**0.93**	*(-10.2)*	*(-10.0)*	*(-6.75)*	*(-6.45)*
Size	1.03***		0.78***		1.12***		0.97***	
	2.8		**2.17**		*(11.8)*		*(8.77)*	
Size dummies								
Medium		1.58***		1.30***		1.5***		1.23***
		4.87		**3.67**		*(8.19)*		*(5.76)*
Large		2.74***		1.85***		3.09***		2.44***
		15.4		**6.34**		*(9.61)*		*(6.49)*
Foreign capital		0.01***	0.02***			0.02***	0.02***	
		1.01	**1.01**			*(4.44)*	*(4.53)*	
Sectoral dummies	NO	NO	YES	YES	NO	NO	YES	YES
Number of obs.	832	832	737	737	832	832	832	832
Pseudo R^2	0.27	0.26	0.41	0.39				

*** (** or *): significant at the 1% (5% or 10%) level. For each explanatory variable, two values are reported: the estimated coefficient, and the odds ratio, which is in bold. Model 1 to Model 4 are estimated using probit method and Model 5 to Model 8 are estimated using linear regression.

5. Synthesis and policy recommendations.

Business services represent an important input in the production function of the manufacturing firms and can stimulate innovation and strengthen productivity. However, due to the paucity of firm level data on the extent of their utilization, only a few studies have investigated the potential such services might have on firms' performance, especially in developing countries. This paper contributes to the scarce empirical literature on the issue using Morocco's manufacturing sector firm level data drawn from "Firm Analysis and Competitiveness Survey" – (FACS) conducted by the Ministry of Commerce and Industry and the World Bank.

Three key conclusions emerge from the paper. First, less than one Moroccan manufacturing firm out of five has already benefited from business services. Firms that never used business services either don't perceive the benefits they can spark, or they see them but can't afford the cost involved. Second, econometric estimates corroborate the common wisdom, namely that firms

using business services tend to, ceteris paribus, be more likely to engage in innovative activities. Such finding applies to both product and process innovations. Third, surprisingly, our estimates indicate that the demand for business services tend to be negatively associated with the likelihood to be involved in export activity. One would expect that the use of business services improves firms' competitiveness and increases their chances to compete on foreign markets. Many Morocco's exporting firms, however, operate in the garment sector and their activities tend to be confined to subcontracting for foreign suppliers.

To sum up, our findings are promising but remain preliminary and further investigation using recent waves of firm level data surveys is needed. This should be particularly relevant as Morocco's manufacturing sector has experienced notable developments over the last decade and there are indications showing a shift towards exports with higher technological content. From technical point of view, two issues deserve particular attention. First, data on several variables collected by FACS such as the firm's product and process innovation or use of business services are binary and thus have limited information content. They don't report the intensity or frequency with which innovation is carried out or how much business services are consumed. Second, the cross-sectional nature of our econometric analysis, does not allow to examine causality direction. For instance, whether innovation improves performance or whether high performing firms are more likely to innovate or demand more business services.

From a public policy perspective, two preliminary insights need to be highlighted. First, on the demand-side, there is a significant proportion of manufacturing firms that miss the potential benefits of business services and the impact they may trigger both on their current performance and potential medium to term growth. The government role remains decisive in supporting access to business services that most small and medium enterprises (SMEs) can't manage to pay on their own. The government can also mitigate quality-related information asymmetry as most SMEs may find it challenging to properly assess services put forward by business services' providers. Second, from the supply-side standpoint, streamlining regulations that affect the performance of business services could be of immense policy interest. Those services are valuable on their own but can also generate significant spillovers both on client industries and on the overall economic growth.

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