Management and Organizational Practices Survey - Colombia 2017-2018

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Executive Summary

Matching the Innovation and Technology Survey 2017-2018 (EDIT, acronym in Spanish) with Annual Manufacturing Survey 2018 (EAM), we analyze the relationship between the performance and management at firm level for Colombia in 2018. The management is a significant driver of variation in productivity, development and innovation (R&Di). Also, a statistically significant relationship is observed for the number of export destinations, products and export revenues.

Table 1: Descriptive Statistics (1)

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Management (1-16)	6,034	0.376	0.176	0.026	0.231	0.504	0.958
No Incentives (1-8)	6,034	0.555	0.198	0.056	0.402	0.701	1.000
Incentives (9-16)	6,034	0.222	0.191	0.000	0.071	0.357	0.952
Size(Firm employment)	6,034	125.502	254.973	0	18	117	4,181
Exporters	6,034	0.328	0.470	0	0	1	1
Multiplant	6,034	0.044	0.206	0	0	0	1

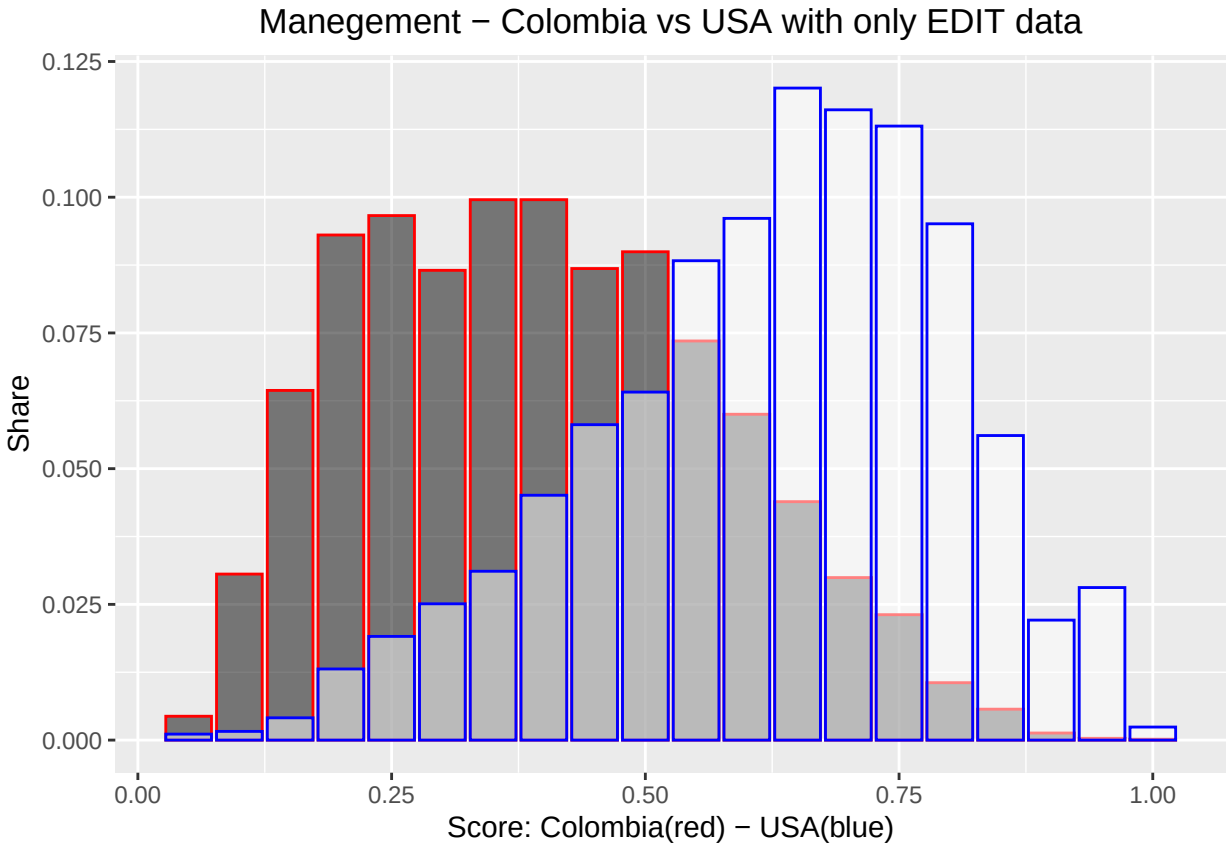
Note:The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample in all columns is allobservations with at least 11 non-missing responses to management questions and a successful match to EAM.

Findings

The Management and Organizational Practices Survey was incorporated for the first time in EDIT 2017 2018 and published with anonymous data on the website of the Colombian Institute of Statistics (DANE). The EDIT included 16 management questions with two basic areas, which are supported on the idea of the continuous improvement. For our regressions, we aggregate those 16 questions into a single measure, which is called the management score. This score is the unweighted average, where the answer to each question is measured on a scale from 0 to 1.

For our regressions, we aggregate those 16 questions into a single measure, which is called the management score. This score is the unweighted average, where the answer to each question is measured on a scale from 0 to 1, where o is the worst option and 1 the best. Table 1 presents the descriptive statistics of the successful merge between EDIT and EAM, and some characteristics at the signature level. In cases where the firm has more than one establishment, the information is added. For our analysis, we use data with at least eleven non-missing responses to the management questions that also have positive values for outcomes and inputs of the firm.

The histogram below shows the distribution for magement score (16 questions). As you can see, the distribution is skewed to the left, where the total number of observations is 7,529 in EDIT. This histogram includes all observations with at least 11 non-missing responses to management questions.



According to Bloom(2019) the average U.S Management score (1-16 questions) is 0.615, the non-incentives (1-8) is 0.643 and the incentives (9-16) is 0.583.

The next table shows the number of observations for each database and our estimates use the merge EDIT-EAM.

Table 2: Databases

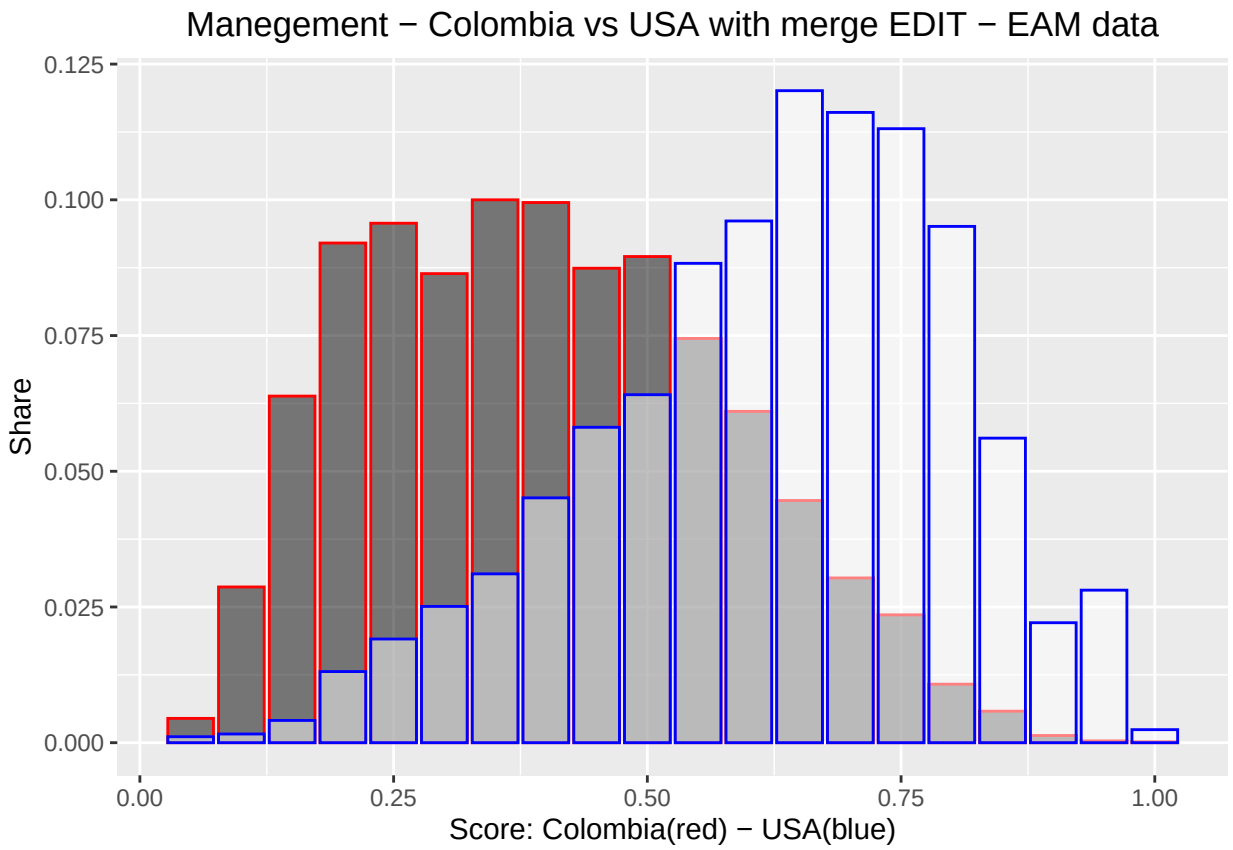
Database	n
EDIT 1:All observations	7,529
EDIT 2:At least 11 non-missing values	6,148
EAM 1:All observations	7,911
EAM 2:Collapsed data	7,256
Merge EDIT 2 - EAM 2	6,034

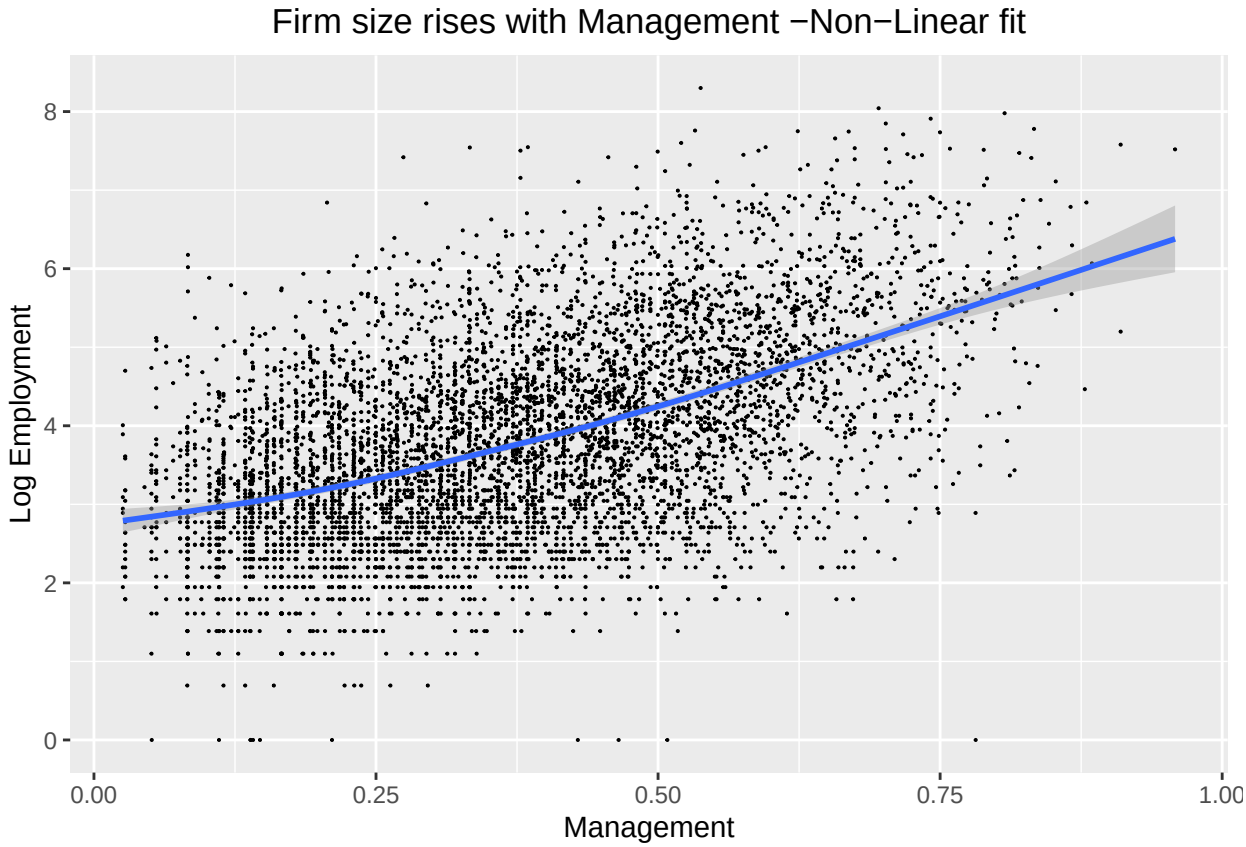
The next histogram shows the distribution for magement score (16 questions) for Colombia and the United States, using the merge between EDIT and EAM with 6,034 observations. It plots the overlapping histogram of firm management scores for Colombia (2018) and the United States (2010) according to Bloom (2019). While the Colombian management score (from 1 to 16 questions) was 0.37, for the U.S was 0.61, which implies that the distribution of Colombia is skewed to the left compared to the United States. The table 1 shows the mean firm size is 125 employees, 32,8% of firms sold abroad and 4.4% have more than one establishment.

Table 3: Descriptive Statistics (2)

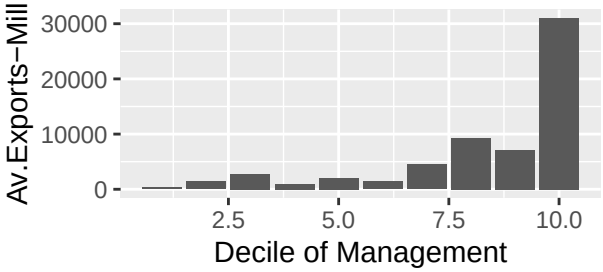
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Total Sales	6,012	40,262.150	270,955.800	8.280	1,273.361	15,685.710	11,679,283.000
Value Added	6,012	15,133.510	73,532.850	0.091	554.676	6,923.818	3,058,511.000
Exports/Sales	6,012	0.068	0.163	0	0	0.04	1
RDi/Sales	1,750	0.010	0.023	0.000	0.0002	0.010	0.381

Note:For the merge between EDIT and EAM,this table shows the descriptive statistics for Total Sales Value Added in millions of colombian pesos, value of exported products/Sales and value of investment on research, development and innovation (RDi)/Sales.

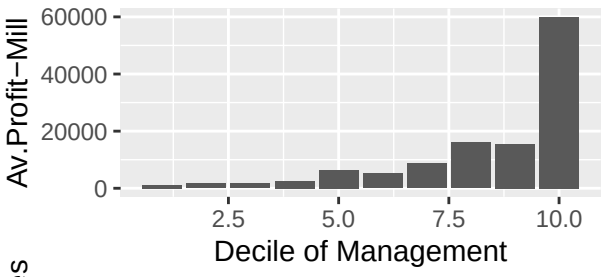


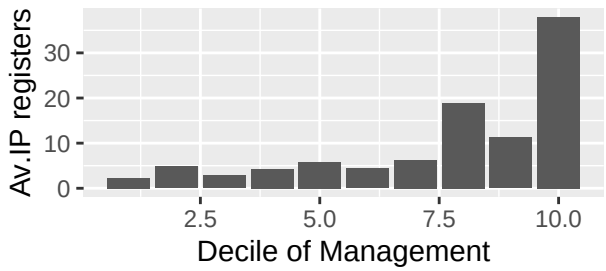

Firm size rises with Management −Non−Linear fit
Log Employment
Management
0
2
4
6
8
0.00
0.25
0.50
0.75
1.00

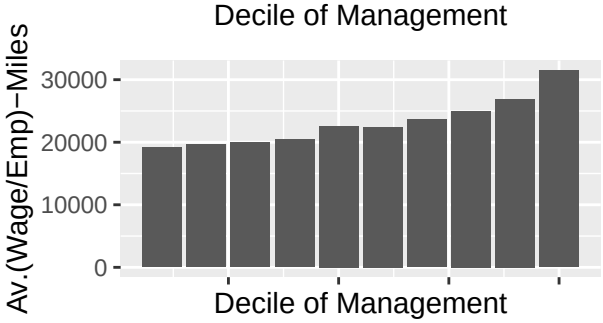

VA/Emp−Mill
Decile of Management
0
50
100
150
200
2.5
5.0
7.5
10.0


Av.Exports−Mill
Decile of Management
0
10000
20000
30000
2.5
5.0
7.5
10.0


Av.RDi−Mill
Decile of Management
0
500
1000
1500
2000
2500
2.5
5.0
7.5
10.0


Av.Profit−Mill
Decile of Management
0
20000
40000
60000
2.5
5.0
7.5
10.0


Av.IP registers
Decile of Management
0
10
20
30
2.5
5.0
7.5
10.0


Av.(Wage/Emp)−Miles
Decile of Management
0
10000
20000
30000
2.5
5.0
7.5
10.0

Performance measures

We divide the performance into four groups, a) productivity: production, sales, value added, total factor productivity where we analyze using a production function b) Innovation: investment on research, development and innovation (RDi) and intellectual properties register, which are inputs and outputs for a firm, c) market competition: management as a dependent variable of external and domestic competition d) trade: exports, imports, number of products sold abroad, destinations, destination product pairs, exports over product destination pairs and exports at top destination-product, where we explore the linkages between management and international trade.

We investigate whether management competence is correlated with those measures of performance. We do not attribute a causal interpretation to the results, instead, it replicates the most of regression from Bloom (2019) and Manova (2020), which allows compare coefficients between Colombia and the United States.

Productivity

Suppose that the firm production function is:

$$Y_i = A_i K_i^{\alpha} L_i^{\beta} I^{\gamma} e^{\delta M_i} e^{\mu X_i} + \varepsilon_i$$

Where Y_i:Production of firm i A_i: Total factor productivity (Excluding Management Practices) K_i:Fixed assets at final of 2018 L_i:Labor inputs: the total number of employees of firm i I_i:Intermediate inputs X_i:Vector of additional factors: the percent of staff with college degree M_i: Management score (1-16)

Dividing by labor and taking logs we can rewrite this in a form to estimate on the data:

$$log\frac{Y_i}{L_i} = \alpha log\frac{K_i}{L_i} + \gamma log\frac{I_i}{L_i} + (\alpha + \beta + \gamma) log L_i + \delta M_i + \mu X_i + u_i$$

We start by running a basic regression of labor productivity (measured as log(output/employee)) on management score, where the first column is calculated with industry fixed effects, the second with location fixed effects and the third without fixed effects. This is repeated for 4 to 6 and 7 to 9 columns, with dependent variable log (sales/employees) and profit/sales, respectively. Using the column 1 as the reference to our comparisons, we find a highly significant coefficient of 0,24, suggesting that whether other variables remain constant, every 10 percentage point increase in our management score is associated with a 2.43% percent (exp(0.024) less 1) increase in labor productivity. The management score has a sample mean of 0.37 and a standard deviation of 0.176, so that a one standard deviation change in management is associated with a 4.31% percent (exp(0.172*0.24)) higher level of labor productivity.

Those results are compared with Bloom(2019), where they estimated 0.209 for management coefficient (with industry fixed effects) and indicated that management practices account for 20% of variation in productivity while we got a r2=10,8% by regressing log(output/employee) on management score. Bloom and Van Reenen (2007) estimate the effect of one standard deviation on productivity is 0.040 using WMS data, which seems comparable with this study.

Since sales may be different from production in a given year, in columns 4 to 6, we run Ln (sales / emp). We find coefficients very similar to columns 1 to 3. Another important indicator for the firm is the operating profits to sales ratio, so we use it as a performance measure. In this case, the management coefficient is not statistically significant, even that happens with other three controls. The next table shows a regression of value added on management and controls, and the management coefficient 0,64 is significant for industry fixed effects, meanwhile for the U.S is 0.498.

Table 4: Firm Management Scores and Performance

	Ln(Output/Emp)			Ln(Sales/Emp)			Profit/Sales		
	1	2	3	4	5	6	7	8	9
Management	0.24***	0.24***	0.25***	0.25***	0.25***	0.26***	−0.01	0.02	0.01
	(0.05)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.08)	(0.07)	(0.06)
Ln(Cap/Emp)	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)
Ln(Input/Emp)	0.67***	0.68***	0.68***	0.66***	0.67***	0.67***	0.12**	0.10	0.10***
	(0.03)	(0.02)	(0.00)	(0.03)	(0.02)	(0.00)	(0.05)	(0.06)	(0.01)
Ln(Employment)	0.05***	0.05***	0.05***	0.04***	0.04***	0.05***	0.01	0.01	0.01
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Degree	0.23**	0.47***	0.46***	0.27***	0.54***	0.52***	−0.07	−0.16	−0.15
	(0.08)	(0.05)	(0.05)	(0.07)	(0.06)	(0.05)	(0.08)	(0.09)	(0.08)
R^2	0.87	0.86	0.86	0.87	0.85	0.85	0.07	0.03	0.03
Adj. R^2	0.87	0.86	0.86	0.86	0.85	0.85	0.05	0.03	0.03
Num. obs.	5988	5988	5988	5988	5988	5988	5988	5988	5988

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
OLS coefficients with standard errors in parentheses. The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0–1 scale. The sample is all EDIT observations with at least 11 non-missing responses to management questions and a successful match to EAM, which have positive value added, positive employment, and positive imputed capital. The columns 1-3 mean the models with Industry Fixed Effects, Location Fixed Effects and no Fixed Effects, respectively.This also applies for columns 4-6 and 7-9. The regressions include clustered standard errors by CIIU4 and region, depending on the fixed effect applied

Innovation

The next table shows a positive correlation with measures of innovation such as investment on RDi as well as the intellectual property registers. This reflects that management practices keep a strong link with inputs and outputs of innovation, and it serves a good predictor of those variables.

Market competition

We specify the possible links between trade liberalization and plant level productivity. Using the firm level measures of TFP , we estimate a regression where independents variables are two kind of tariffs: Average Output Tariff and Weighted Input Tariff. Further, we estimate a competitive pressure using the China Import Share, where its sign is negative.

Trade

We examine the relationship between firms' management practices and export performance, testing four propositions:

Proposition 1: Better managed firms are more likely to export. Proposition 2: Better managed firms export more products to more destination markets and earn higher export revenues Proposition 3: The management is more important determinant in heterogeneous industries than homogeneous Proposition 4: Better management exporters reduce the geographic distance.

Table 5: Firm Management Scores and Performance

	Log(VA/Emp)			Log(1+IP Registers)			Log(1+RDi/Emp)		
	1	2	3	4	5	6	7	8	9
Management	0.64***	0.69***	0.71***	0.51***	0.55***	0.55***	2.94***	2.93***	3.07***
	(0.08)	(0.06)	(0.09)	(0.11)	(0.11)	(0.12)	(0.51)	(0.39)	(0.56)
Ln(Cap/Emp)	0.21***	0.24***	0.24***	0.09***	0.09***	0.09***	0.19*	0.33***	0.33***
	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)	(0.09)	(0.03)	(0.07)
Ln(Employment)	0.18***	0.17***	0.18***	0.33***	0.32***	0.32***	0.11	0.07	0.09
	(0.02)	(0.01)	(0.01)	(0.04)	(0.02)	(0.02)	(0.08)	(0.10)	(0.08)
Degree	0.89***	1.39***	1.39***	1.06***	2.11***	2.11***	1.54	2.79***	2.64***
	(0.14)	(0.09)	(0.14)	(0.23)	(0.24)	(0.22)	(0.95)	(0.50)	(0.81)
R^2	0.20	0.25	0.27	0.27	0.27	0.28	0.05	0.07	0.07
Adj. R^2	0.18	0.25	0.27	0.23	0.27	0.28	−0.03	0.05	0.07
Num. obs.	5988	5988	5988	2534	2534	2534	1749	1749	1749

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
OLS coefficients with standard errors in parentheses. The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0–1 scale. The sample is all EDIT observations with at least 11 non-missing responses to management questions and a successful match to EAM, which have positive value added, positive employment, and positive imputed capital. The columns 1-3 mean the models with Industry Fixed Effects, Location Fixed Effects and no Fixed Effects, respectively.This also applies for columns 4-6 and 7-9.The regressions include clustered standard errors by CIIU4 and region, depending on the fixed effect applied

Table 6: Drivers of Productivity Variation

	Log(VA/Emp)			
	1	2	3	4
Management	1.950***	1.687***	1.694***	1.652***
	(0.080)	(0.084)	(0.084)	(0.083)
RDi		0.044***	0.043***	0.038***
		(0.005)	(0.004)	(0.004)
ICT/Emp			0.000*	0.000
			(0.000)	(0.000)
Degree				1.517***
				(0.148)
R^2	0.101	0.115	0.116	0.139
Adj. R^2	0.100	0.115	0.116	0.138
Num. obs.	6026	6026	6026	6026

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
OLS coefficients with standard errors in parentheses.Dependent variable is firm level log(Value Added/Employment). Independent variables are Management score, RDi is measured as log(1+RDi intensity), where RDi intensity is the total domestic Research, Development and innovation expenditure in 2018 divided by total domestic employment, ICT/Emp is investment per worker (spending on information and communication technology hardware and software per employee), Degree is measured by the share of employees (managers and non-managers) with a college degree.Missing values have been replaced by zero for RDi and by means for the other variables. The regressions include robust standard errors

Table 7: TFP at firm level and Tariffs

	Revenue-based Total Factor Productivity
	1
Average Output Tariff	−0.011
	(0.157)
Weighted Input Tariff	0.905
	(0.532)
R^2	0.006
Adj. R^2	0.006
Num. obs.	5835

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.

OLS coefficients with standard errors in parentheses.Dependent variable is firm level Total Factor Productivity. According to Konings and Amiti(2005),independent variables are the Average Output Tariff and Weighted Input Tariff. The Average Tariff is the average of the tariffs according to the CIIU 4 code of the firm, using the data from International Trade Center ITC: macmap.org.Since tariffs are classified HS codes, we use a table from DANE, which has an equivalence between HS codes and CIIU4, published in: https://www.dane.gov.co/index.php/sistema-estadistico-nacional-sen/normas-y-estandares/nomenclaturas-y-clasificaciones/tablas-correlativas, trade section. For the Weighted Input Tariff, we use the imported input -output matrix (IIOM) published by DANE: https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-anuales/matrices-complementarias, (2015). Since IOM does not use CIIU4 codes, we elaborate a concordance table between IIOM activities and two or three digits CIIU4 levels. The average tariff of these two or three digits CIIU4 levels is weighted by the IIOM and subsequently matched to the firm two or three digits CIIU4 codes. The concordance table is in the annex. The regressions include clustered standard errors by four digits CIIU4 codes

Table 8: Drivers of Total Factor Productivity

	Revenue-based Total Factor Productivity - RTFP			
	1	2	3	4
Management	0.147***	0.129***	0.132***	0.128***
	(0.026)	(0.028)	(0.028)	(0.028)
RDi		0.003	0.003	0.002
		(0.002)	(0.002)	(0.002)
ICT/Emp			0.000	0.000
			(0.000)	(0.000)
Degree				0.120**
				(0.057)
R^2	0.005	0.006	0.006	0.008
Adj. R^2	0.005	0.006	0.006	0.007
Num. obs.	5834	5834	5834	5834

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.

OLS coefficients with standard errors in parentheses. Dependent variable is firm level TFP built from industry firm-level. Independent variables are management score, RDi measured as log(1+RDi intensity) where RDi intensity is the total domestic RDi expenditure divided by total domestic employment, IT investment per worker, skill measured by the share of employees (managers and non-managers) with a college degree.Missing values have been replaced by zero for RDi and by means for the other variables.The regressions include robust standard errors

Table 9: Market Competition and Management

	Management				
	1	2	3	4	5
Lerner Index	0.012	0.012	0.012	−0.003	−0.000
	(0.009)	(0.009)	(0.009)	(0.008)	(0.005)
Average Output Tariff		−0.098	0.040	−0.015	−0.031
		(0.125)	(0.182)	(0.191)	(0.088)
Weighted input Tariff			−0.420	−0.416	−0.118
			(0.359)	(0.354)	(0.163)
Inter Lerner*Tariff				0.263	0.057
				(0.140)	(0.083)
Ln(Cap/Emp)					0.013***
					(0.001)
Ln(Employment)					0.069***
					(0.003)
Degree					0.158***
					(0.023)
R^2	0.036	0.037	0.040	0.042	0.309
Adj. R^2	0.032	0.033	0.036	0.038	0.306
Num. obs.	5654	5654	5654	5654	5654

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
Lerner Index is the gross profits over sales, where gross profits equals to production value less material costs and wage costs in 2018.The Average Tariff is the average of the tariffs according to the CIIU 4 code of the firm, using the data from International Trade Center ITC: macmap.org.Since tariffs are classified HS codes, we use a table from DANE, which has an equivalence between HS codes and CIIU4, published in: https://www.dane.gov.co/index.php/sistema-estadistico-nacional-sen/normas-y-estandares/nomenclaturas-y-clasificaciones/tablas-correlativas, trade section. For the Weighted Input Tariff, we use the imported input -output matrix (IIOM) published by DANE: https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-anuales/matrices-complementarias, (2015). Since IOM does not use CIIU4 codes, we elaborate a concordance table between IIOM activities and two or three digits CIIU4 levels. The average tariff of these two or three digits CIIU4 levels is weighted by the IIOM and subsequently matched to the firm two or three digits CIIU4 codes. The concordance table is in the annex. The last column of this regression table includes a interaction between Lerner Index and Average Output Tariff and full controls. All regressions have Location Fixed Effects by department in Colombia and clustered standard errors by CIIU 4.

Table 10: China Import Share and Management

	Management	
	1	2
China Import Share	−0.097**	−0.031*
	(0.033)	(0.015)
Ln(Cap/Emp)		0.013***
		(0.002)
Ln(Employment)		0.070***
		(0.003)
Degree		0.149***
		(0.022)
R^2	0.011	0.300
Adj. R^2	0.011	0.299
Num. obs.	5654	5654

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
The China Import Share means imports from China / Total imports for each industry (4 digits CIIU rev4). This table uses this China Import Share without controls:column (1), and with full controls:column (2). We estimated the China Import Share according to the Import Origin published by DANE and matched them to the firm four digits CIIU4 codes.The regressions include clustered standard errors by four digits CIIU4 codes.

Table 11: Differentiated Products and Management

	Log(1+Exports)
Management	3.470**
	(1.276)
Inter Manag*Diff	−1.354
	(1.596)
Differentiated=1	1.358*
	(0.570)
Ln(Cap/Emp)	0.754***
	(0.103)
Ln(Employment)	2.740***
	(0.159)
Degree	9.078***
	(1.416)
R^2	0.376
Adj. R^2	0.373
Num. obs.	5141

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between logartithm of (1+value of exported products) at firm level and firm's management practices.It includes a interaction between Management and a Dummy of Differentiated Product:Inter Manag*Diff= 1 when the firm product is differentiated and O otherwise, using Rauch clasiffication. Since Rauch(1999) classifies products at the level of 4 digits of industry, this table assumes that the firm produces only one good, either homogeneous or differentiated, according to its industry(CIIU rev4).In addition, it includes full controls: Ln(Cap/Emp), Ln(Employment) and the percent of staff with college degree. Since Rauch classification used 3 and digit SITC rev.2 levels, we use a concordance table from DANE, which has an equivalence between SITC.rev2 (CPC ver 2.0 in Spanish) and CIIU rev 4, published in: https://www.dane.gov.co/index.php/sistema-estadistico-nacional-sen/normas-y-estandares/nomenclaturas-y-clasificaciones/tablas-correlativas, trade section. The regressions include clustered standard errors by four digits CIIU4 codes

Table 12: Logarithms of trade outcomes and Management

	Log(1+Exports)	Log(1+Imports)	Log(1+Exports+Imports)
Management	2.951***	2.345***	3.521***
	(0.487)	(0.449)	(0.464)
Ln(Cap/Emp)	0.740***	0.763***	0.816***
	(0.075)	(0.076)	(0.073)
Ln(Employment)	2.794***	2.327***	2.973***
	(0.145)	(0.145)	(0.141)
Degree	6.190***	5.646***	6.583***
	(0.951)	(0.619)	(0.979)
R^2	0.479	0.439	0.496
Adj. R^2	0.466	0.424	0.483
Num. obs.	5860	5860	5860

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between logartithm of (1+value of exported products), logarithm of (1+value of imported inputs) and logarithm of (1+value of exported products + imported inputs) at firm level and firm's management practices.It includes some controls: Ln(Cap/Emp), Ln(Employment) and the percent of staff with college degree. All regressions include fixed effects for firm location (department) and 4 digits - CIIU 4 (industry) and clustered standard errors by CIIU4.

Table 13: Dummies of trade outcomes and Management

	Dummy Exports	Dummy Imports	Dummy Trade
Management	0.192***	0.131***	0.211***
	(0.037)	(0.031)	(0.034)
Ln(Cap/Emp)	0.043***	0.048***	0.046***
	(0.005)	(0.005)	(0.005)
Ln(Employment)	0.177***	0.147***	0.177***
	(0.009)	(0.009)	(0.009)
Degree	0.380***	0.366***	0.382***
	(0.075)	(0.043)	(0.076)
R^2	0.401	0.384	0.398
Adj. R^2	0.385	0.368	0.382
Num. obs.	5860	5860	5860

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between export status (Dummy Exports = 1 if value of exported products>0 and 0 otherwise), import status (Dummy Import=1 if value of imported inputs>0 and 0 otherwise), trade status (Dummy Trade=1 if value of exports + imports>0 and 0 otherwise) and firm's management practices.It includes some controls: Ln(Cap/Emp), Ln(Employment) and the percent of staff with college degree. All regressions include fixed effects for firm location (department) and 4 digits - CIIU 4 (industry) and clustered standard errors by CIIU4.

Table 14: Shares of trade outcomes and Management

	Share of exported products	Share of imported inputs	Share of traded
Management	0.051***	0.071***	0.060***
	(0.012)	(0.019)	(0.012)
Ln(Cap/Emp)	0.011***	0.017***	0.013***
	(0.002)	(0.003)	(0.002)
Ln(Employment)	0.027***	0.043***	0.032***
	(0.003)	(0.004)	(0.003)
Degree	0.089***	0.142***	0.108***
	(0.027)	(0.025)	(0.022)
R^2	0.241	0.275	0.286
Adj. R^2	0.221	0.255	0.267
Num. obs.	5755	5755	5755

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between Share of exported products = exports/total sales, Share of imported inputs=imports/total inputs, Share of traded=(exports+imports)/(total sales + inputs) and firm's management practices.It includes some controls: Ln(Cap/Emp), Ln(Employment) and the percent of staff with college degree. All regressions include fixed effects for firm location (department) and 4 digits - CIIU 4 (industry) and clustered standard errors by CIIU4.

Table 15: Extensive and Intensive Margins - No employment and No fixed effects

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	1.64***	1.62***	2.25***	3.80***	2.17***	2.19***	1.55***	3.15***
	(0.16)	(0.19)	(0.24)	(0.34)	(0.22)	(0.27)	(0.21)	(0.29)
Ln(Cap/Emp)	0.08**	−0.10	−0.03	0.37***	0.28***	0.46***	0.40***	0.40***
	(0.03)	(0.06)	(0.07)	(0.08)	(0.06)	(0.06)	(0.05)	(0.07)
Degree	0.53	0.48	0.69	0.39	−0.14	−0.10	−0.31	0.03
	(0.29)	(0.34)	(0.37)	(0.68)	(0.50)	(0.60)	(0.43)	(0.64)
Ln(Wage/Emp)	0.37***	0.42***	0.56***	0.89***	0.53***	0.48**	0.34**	0.68***
	(0.07)	(0.05)	(0.07)	(0.16)	(0.11)	(0.16)	(0.12)	(0.15)
R^2	0.17	0.10	0.13	0.21	0.16	0.18	0.17	0.20
Adj. R^2	0.16	0.10	0.13	0.20	0.16	0.18	0.17	0.20
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports. LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions have standard errors clustered by CIIU4.

Table 16: Extensive and Intensive Margins - No Employment and Fixed Effects,

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	1.77***	1.71***	2.46***	3.88***	2.11***	2.17***	1.43***	3.14***
	(0.14)	(0.16)	(0.20)	(0.31)	(0.20)	(0.27)	(0.21)	(0.27)
Ln(Cap/Emp)	0.08**	0.03	0.06	0.33***	0.25***	0.30***	0.26***	0.32***
	(0.03)	(0.02)	(0.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Degree	0.75**	0.86*	1.11**	0.13	−0.62	−0.73	−0.99*	−0.42
	(0.26)	(0.35)	(0.39)	(0.64)	(0.48)	(0.47)	(0.40)	(0.58)
Ln(Wage/Emp)	0.43***	0.44***	0.63***	1.11***	0.68***	0.67***	0.48***	0.90***
	(0.07)	(0.06)	(0.08)	(0.16)	(0.11)	(0.16)	(0.13)	(0.16)
R^2	0.29	0.32	0.30	0.36	0.33	0.36	0.34	0.35
Adj. R^2	0.24	0.27	0.25	0.31	0.28	0.32	0.30	0.31
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports.LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions have fixed effects by four digits CIIU4 and location and standard errors clustered by CIIU4.

Table 17: Extensive and Intensive Margins - With employment, No fixed effects

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	0.54^{**}	0.44^{*}	0.63^{*}	0.99^{**}	0.45	0.55	0.36	0.82^{*}
	(0.18)	(0.20)	(0.25)	(0.38)	(0.25)	(0.30)	(0.24)	(0.34)
Ln(Cap/Emp)	0.03	-0.15^{**}	-0.11	0.23^{**}	0.20^{***}	0.38^{***}	0.34^{***}	0.29^{***}
	(0.03)	(0.05)	(0.06)	(0.08)	(0.05)	(0.06)	(0.05)	(0.06)
Ln(Empl)	0.35^{***}	0.37^{***}	0.51^{***}	0.89^{***}	0.54^{***}	0.52^{***}	0.37^{***}	0.73^{***}
	(0.03)	(0.04)	(0.05)	(0.07)	(0.05)	(0.05)	(0.04)	(0.06)
Degree	1.29^{***}	1.29^{***}	1.82^{***}	2.33^{**}	1.04^{*}	1.04	0.51	1.64^{*}
	(0.36)	(0.27)	(0.35)	(0.72)	(0.47)	(0.66)	(0.46)	(0.69)
Ln(Wage/Emp)	0.27^{***}	0.32^{***}	0.42^{***}	0.65^{***}	0.38^{***}	0.34^{*}	0.23	0.48^{**}
	(0.07)	(0.05)	(0.08)	(0.17)	(0.11)	(0.16)	(0.12)	(0.16)
R^2	0.26	0.21	0.24	0.32	0.25	0.24	0.22	0.29
Adj. R^2	0.26	0.21	0.24	0.32	0.25	0.24	0.22	0.29
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports. LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product). The regressions include employment as a control and have standard errors clustered by CIIU4.

Table 18: Extensive and Intensive Margins - With Employment and Fixed Effects and

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	0.73^{***}	0.65^{***}	0.97^{***}	1.29^{***}	0.56^{*}	0.64^{*}	0.32	1.00^{**}
	(0.17)	(0.15)	(0.19)	(0.34)	(0.23)	(0.31)	(0.25)	(0.33)
Ln(Cap/Emp)	0.02	-0.03	-0.02	0.18^{***}	0.16^{***}	0.21^{***}	0.20^{***}	0.20^{***}
	(0.03)	(0.02)	(0.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Ln(Empl)	0.36^{***}	0.37^{***}	0.52^{***}	0.90^{***}	0.54^{***}	0.53^{***}	0.38^{***}	0.74^{***}
	(0.03)	(0.03)	(0.05)	(0.07)	(0.05)	(0.05)	(0.04)	(0.06)
Degree	1.45^{***}	1.58^{***}	2.12^{***}	1.88^{***}	0.43	0.30	-0.24	1.03
	(0.32)	(0.24)	(0.32)	(0.56)	(0.37)	(0.51)	(0.40)	(0.53)
Ln(Wage/Emp)	0.31^{***}	0.32^{***}	0.47^{***}	0.83^{***}	0.51^{***}	0.51^{**}	0.36^{**}	0.66^{***}
	(0.08)	(0.06)	(0.08)	(0.17)	(0.11)	(0.17)	(0.13)	(0.16)
R^2	0.38	0.40	0.40	0.46	0.40	0.41	0.38	0.44
Adj. R^2	0.33	0.36	0.36	0.42	0.36	0.37	0.34	0.40
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports. LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions have standard errors clustered by CIIU4.

Table 19: Extensive and Intensive Margins - With employment Dummies, No fixed effects

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	0.75***	0.72***	0.96***	1.46***	0.72**	0.74**	0.51*	1.21***
	(0.16)	(0.19)	(0.23)	(0.34)	(0.23)	(0.28)	(0.23)	(0.31)
Ln(Cap/Emp)	0.03	−0.14**	−0.10	0.24**	0.20***	0.38***	0.34***	0.29***
	(0.03)	(0.05)	(0.06)	(0.07)	(0.05)	(0.06)	(0.05)	(0.06)
Big=1	1.08***	1.09***	1.58***	2.84***	1.76***	1.75***	1.26***	2.35***
	(0.10)	(0.11)	(0.15)	(0.22)	(0.15)	(0.16)	(0.13)	(0.19)
Medium=1	0.43***	0.41***	0.62***	1.12***	0.69***	0.71***	0.50***	0.90***
	(0.06)	(0.06)	(0.08)	(0.13)	(0.10)	(0.10)	(0.08)	(0.12)
Degree	1.10***	1.06***	1.53***	1.90**	0.80	0.84	0.37	1.28
	(0.33)	(0.29)	(0.35)	(0.69)	(0.47)	(0.64)	(0.45)	(0.66)
Ln(Wage/Emp)	0.28***	0.33***	0.44***	0.68***	0.39***	0.34*	0.24*	0.50***
	(0.07)	(0.05)	(0.08)	(0.16)	(0.11)	(0.15)	(0.12)	(0.15)
R^2	0.25	0.19	0.22	0.31	0.24	0.24	0.22	0.29
Adj. R^2	0.25	0.18	0.22	0.30	0.24	0.24	0.22	0.28
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firm's management practices and the extensive and intensive margins of their exports. LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions include dummies employment as a control, where 50<medium<250 workers,big>250 and small<50 is excluded by collinearity .It also has standard errors clustered by CIIU4.

Table 20: Extensive and Intensive Margins - With Employment Dummies and Fixed Effects

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	0.94***	1.01***	1.29***	1.82***	0.88***	0.89**	0.52*	1.44***
	(0.15)	(0.16)	(0.19)	(0.31)	(0.22)	(0.29)	(0.24)	(0.30)
Ln(Cap/Emp)	0.02	0.01	−0.01	0.19***	0.17***	0.21***	0.20***	0.21***
	(0.03)	(0.02)	(0.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Big=1	1.13***	1.12***	1.57***	2.80***	1.67***	1.74***	1.23***	2.32***
	(0.09)	(0.08)	(0.13)	(0.22)	(0.15)	(0.17)	(0.13)	(0.19)
Medium=1	0.44***	0.43***	0.62***	1.08***	0.64***	0.66***	0.46***	0.87***
	(0.05)	(0.06)	(0.07)	(0.12)	(0.09)	(0.09)	(0.08)	(0.11)
Degree	1.23***	1.68***	1.80***	1.33*	0.10	0.01	−0.47	0.56
	(0.29)	(0.29)	(0.33)	(0.56)	(0.40)	(0.48)	(0.39)	(0.52)
Ln(Wage/Emp)	0.32***		0.49***	0.85***	0.53***	0.51**	0.37**	0.69***
	(0.07)		(0.08)	(0.16)	(0.11)	(0.16)	(0.13)	(0.15)
R^2	0.37	0.37	0.38	0.45	0.39	0.41	0.38	0.43
Adj. R^2	0.32	0.32	0.34	0.41	0.35	0.37	0.34	0.38
Num. obs.	2044	2044	2044	2044	2044	2044	2044	2044

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports. LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions include dummies employment as a control, where 50<medium<250 workers,big>250 and small<50 is excluded by collinearity. It also has standard errors clustered by CIIU4.

Table 21: Extensive and Intensive Margins for HOMOGENEOUS PRODUCTS - With Employment Dummies and Fixed Effects

	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	1.12***	1.11**	1.29**	1.91***	0.79*	0.94*	0.62	1.52***
	(0.24)	(0.38)	(0.40)	(0.49)	(0.35)	(0.47)	(0.40)	(0.45)
Ln(Cap/Emp)	0.01	0.04	−0.05	0.11	0.10	0.13	0.16*	0.13
	(0.05)	(0.04)	(0.05)	(0.11)	(0.07)	(0.09)	(0.08)	(0.10)
Big=1	0.80***	0.84***	1.12***	2.19***	1.39***	1.44***	1.06***	1.90***
	(0.16)	(0.13)	(0.21)	(0.35)	(0.24)	(0.30)	(0.23)	(0.31)
Medium=1	0.41**	0.31*	0.57***	1.08***	0.67***	0.78***	0.51***	0.90***
	(0.13)	(0.14)	(0.16)	(0.23)	(0.14)	(0.17)	(0.12)	(0.20)
Degree	0.49	1.71*	1.33	−0.06	−0.55	−1.25	−1.38*	−0.90
	(0.51)	(0.68)	(0.72)	(0.83)	(0.45)	(0.79)	(0.56)	(0.76)
Ln(Wage/Emp)	0.64***		0.85***	1.68***	1.04***	1.17***	0.82***	1.41***
	(0.11)		(0.14)	(0.16)	(0.09)	(0.14)	(0.11)	(0.13)
R^2	0.38	0.31	0.35	0.45	0.43	0.46	0.45	0.45
Adj. R^2	0.31	0.24	0.27	0.39	0.36	0.40	0.39	0.38
Num. obs.	582	582	582	582	582	582	582	582

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports, filtering data for homogeneous products according to classification by Rauch (1999) LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions include dummies employment as a control, where 50<medium<250 workers,big>250 and small<50 is excluded by collinearity. It also has standard errors clustered by CIIU4.

Table 22: Extensive and Intensive Margins for DIFFERENTIATED PRODUCTS - With Employment Dummies and Fixed Effects

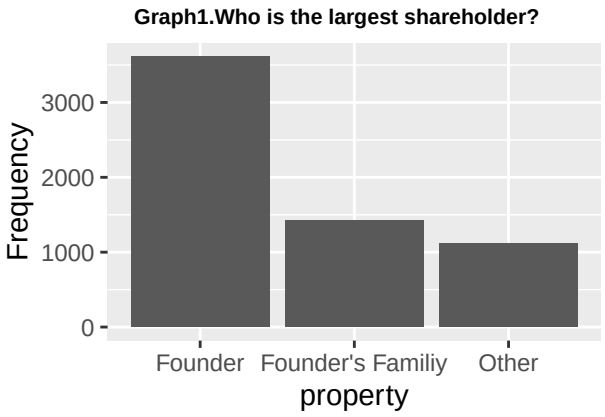
	LnD	LnP	LnD-P	LnExp	LnExp/D	Ln Exp/P	Ln Exp/D-P	Ln TopD-P
Management	0.89***	1.01***	1.33***	1.90***	1.01**	0.97*	0.58	1.50***
	(0.20)	(0.19)	(0.23)	(0.44)	(0.31)	(0.40)	(0.33)	(0.44)
Ln(Cap/Emp)	0.00	−0.00	−0.03	0.15*	0.15***	0.18***	0.18***	0.17**
	(0.04)	(0.03)	(0.05)	(0.06)	(0.04)	(0.05)	(0.04)	(0.06)
Big=1	1.31***	1.25***	1.82***	3.12***	1.82***	1.92***	1.31***	2.54***
	(0.10)	(0.11)	(0.15)	(0.25)	(0.19)	(0.18)	(0.15)	(0.22)
Medium=1	0.46***	0.50***	0.66***	1.16***	0.70***	0.68***	0.50***	0.94***
	(0.06)	(0.07)	(0.09)	(0.14)	(0.11)	(0.11)	(0.09)	(0.13)
Degree	1.70***	1.67***	2.04***	1.95*	0.25	0.64	−0.09	1.11
	(0.32)	(0.30)	(0.38)	(0.76)	(0.59)	(0.57)	(0.51)	(0.68)
Ln(Wage/Emp)	0.22**		0.38***	0.57**	0.34*	0.27	0.18	0.43*
	(0.08)		(0.09)	(0.21)	(0.15)	(0.21)	(0.18)	(0.20)
R^2	0.37	0.39	0.41	0.44	0.36	0.35	0.31	0.40
Adj. R^2	0.32	0.35	0.37	0.40	0.31	0.30	0.26	0.36
Num. obs.	1247	1247	1247	1247	1247	1247	1247	1247

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between firms' management practices and the extensive and intensive margins of their exports, filtering data for differentiated products according to classification by Rauch (1999). LnD:Log of destinations,LnP:Log of products by HS 6 digits,LnD-P: Log of pairs destination-products,LnExp: Log of Exports, LnExp/D: Log(Exports/Destinations,Ln Exp/P:Log(Exports/Products),Ln Exp/D-P:Log(Exports/pairs destination-products),Ln TopD-P:Log(exports in a firm's highest-revenue destination-product).The regressions include dummies employment as a control, where 50<medium<250 workers,big>250 and small<50 is excluded by collinearity. It also has standard errors clustered by CIIU4.

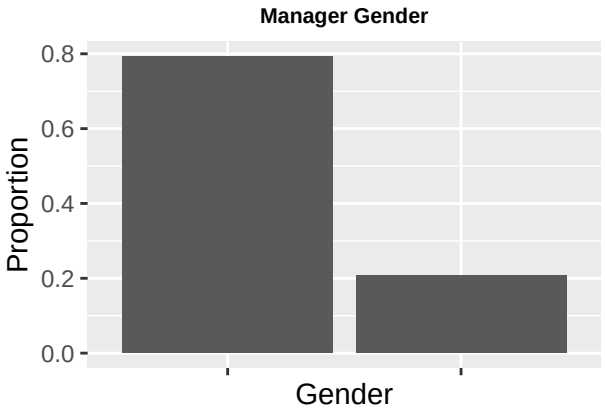
Table 23: Exports Revenues with country controls

	Ln Exports	
	1	2
Management	0.65*	0.82**
	(0.29)	(0.31)
Ln(Cap/Emp)	0.18***	0.17***
	(0.04)	(0.04)
Big=1	0.90***	1.13***
	(0.13)	(0.13)
Medium=1	0.31**	0.39***
	(0.10)	(0.10)
Degree	0.11	0.66
	(0.53)	(0.51)
Ln(Wage/Emp)	0.09	0.14
	(0.14)	(0.14)
Ln (GDP of destination)		0.28***
		(0.03)
Ln Distance		−0.54***
		(0.08)
Common Language=1		0.64***
		(0.11)
Contiguous=1		0.26**
		(0.09)
R^2	0.14	0.20
Adj. R^2	0.13	0.19
Num. obs.	14502	14502

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
This table examines the relationship between exports revenues of each country and firm's management practices. The column 1 has controls at firm level: capital per employees, dummies of size measured by employment(Big=1,Medium=1), the share of staff with college degree and the average wage.This table uses dummies of size (50<medium<250 workers,big>250; small<50 is excluded by collinearity).The column 2 adds controls at country level: log of GDP of destination country, log of distance between the destination country and Colombia and dummies of common language and geographic contiguity.The regressions include fixed effects for CIIU4 and location and standard errors clustered by CIIU4


Graph1.Who is the largest shareholder?
Frequency
3000
2000
1000
0
Founder
Founder's Familiy
Other
property


Is the manager the same founder or founder's family member?
Proportion
0.6
0.4
0.2
0.0
No
Yes
Manager


Manager Gender
Proportion
0.8
0.6
0.4
0.2
0.0
Gender