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ABSTRACT

INTERNATIONAL MANAGERIAL SKILL AND BIG COLOMBIAN EXPORTING FIRMS' PERFORMANCE, 2006-2014*

Federico Alberto Merchan Alvarez

This paper presents a novel methodology to measure international managerial skill, which has not been directly measured in the specialized management quality surveys. The international managerial quality variable captures the manager's organizational capital contribution to improve production efficiency of exported products that compete in the international market by price, and to upgrade quality capacity of the exported products that compete by quality. Using a sample of the biggest private Colombian exporting firms, the short-term econometric analysis indicates that: i) international managerial quality has a positive and robust effect on total exported value via intensive margin, ii) the exported value elasticity relative to international managerial quality is higher but not statistically different than exported value elasticity relative to exogenous international demand shocks, and iii) better managers in the international market learn by exporting.

Keywords: management practices, quality vs price competition, firm's performance, intensive margin, exporting, learning by exporting

JEL classification: F16, F10, M11, M12, L25

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1 Introduction

It has been found in different countries that firms with similar input consumption produce significative different output magnitude. The Total Factor Productivity (TFP) 90-10 percentile ratio – output difference between a 90th percentile productivity plant relative to 10th percentile productivity plant with equal input consumption – rounds 5 for Colombia (Camacho and Canover, 2010), 2 for US and 5 for India and China (Syverson, 2004). Given the high TFP contribution to aggregate economic growth, the economic literature has described TFP determinants from different perspectives: research and development expenditure, demand and market structure, worker's human capital, incentive-pay, human resources practices, social connections among co-workers, technology spillovers, organizational form and managerial talent and practices, among others (Syverson, 2011).

Regarding the last literature group, one of the biggest methodological challenges that managerial economics literature faced for many years was to measure accurately the managerial talent due to absence of high-quality data across industries and countries. This problem has been gradually solved in the last decades due to surveys like World Management Survey (WMS), which is the biggest survey around the globe that measure managerial practices in a consistent way for 20,000 manufacturing firms in 34 countries (Bloom and Van Reenen, 2007), the Management and Organizational Practices Survey (MOPC) by the US Census Bureau (Buffington et al., 2016), the German Management and Organizational Practices Survey (GMOP) (Broszeit et al., 2019), or the National Survey on Productivity and Competitiveness of Micro, Small, and Medium-size Enterprises in Mexico (Bloom et al., 2022), among others.

Although numerous investigations have been carried out using data from these management surveys, there are only two papers relating international firm trade outcomes with management quality. On one hand, Bloom et al. (2021) prove that better managed firms have higher probability to export, they export higher value, export higher number of products and import higher inputs quality, using a merged sample of the WMS, customs and financial level information for a set of American and Chinese firms. Also, they calculate that management has large explanatory power on different trade outcomes than other TFP components. On the other hand, Görg and Hanley (2017) explore firm trade outcomes and management relationship from the opposite causality direction, finding that switching into exporting between 2008 and 2013 impacts positively the German management performance using the GMOP.

Nevertheless, none of these papers or management surveys inquire into specific management practices involved in the exported products production. Although the WMS[1] and GMOP[2] asks about export share relative to total sales and basic information about firm activity abroad, those surveys do not differentiate management firm's practices involved in the goods sold in the local and international market. This is one of the reasons why most of the export management empirical research has been led by case studies with small sample sizes; the median sample of the 16 most influential empirical articles about this subject is 202 firms, based on Leonidou et al. (2010) classification (see appendix table 1). The only exception is Sala and Yalcin (2014), who constructed a "*managerial inputs*" proxy variable based on the manager's international experience calculated from rich panel Denmark payroll database, finding that managerial input is a determinant as important as productivity and fixed costs of firm's selection into international market.

Nonetheless, export management is a research topic that should be analyzed in more depth, as some economic hypothesis point that firms could implement different managerial practices for exported

[1] *Microsoft Word - Manufacturing Survey Instrument.doc (worldmanagementsurvey.org)*

[2] *infas_Fragebogen_MOrg_5078_20141020_.indd (iab.de)*

goods relative to goods sold in the local market. For example, *learning by exporting* (LBE) indicates that when firms start exporting, their productivity could increase due to different mechanisms: learning process from foreign customers and rivals, improving product quality, shipment size adjustment (De Loecker, 2013), adopting new technologies, acquiring important information about foreign markets, and upgrading product designs (Tse et al., 2017). Although literature has shown mixed results about LBE existence[3], the positive evidence is not conclusive about two aspects: i) which mechanism is driven LBE[4], and ii) if productivity gains and knowledge acquired in the international market by LBE can be implemented in the overall production process, or, if there is an upgrade in managerial practices just for the firms' international market segment.

Also, Alchian – Allen theorem states that per unit taxes increase the demand for high-quality goods relative to low-quality substitute goods, because high quality goods become relatively cheaper. Miljkovic and Gomez (2019) found validity for this theorem for the Brazilian coffee exports, and there is also supporting data evidence for Colombian coffee exports[5]. On a larger scale, Hummels and Skiba (2004) proof the Alchian – Allen theorem validity for a bilateral trade data from six thousand country-pairs in each of more than 5,000 goods. Therefore, the managers would have incentives to adjust firm's managerial practices to promote high quality good exports, as they become relative cheaper and its international demand will increase due to per unit taxes, assuming that Alchian – Allen theorem is always valid[6].

In this sense, managerial practices involved in the production of the exported goods could be different than managerial practices involved in the production of the goods sold in the local market, but specialized management surveys are not measuring that difference and the academic evidence about this aspect is scarce. The intention of this paper is not to fill this literature gap completely, but it is a first methodological approach to estimate managerial quality in the international market. This variable also allows to compare the importance of international managerial quality on firm's performance relative to other internal and external firm level explanatory variables, following the literature recommendation: "*export performance should be assessed at two broad levels – the external environment level and the internal level. However, there is a lack of agreement on the domains and measurement of the determinants of export performance*" (Coelho et al., 2008, p.363).

Specifically, the international managerial quality variable quantifies the degree to which the organizational capital invested by the manager allows to improve firms' production efficiency and quality capacity mechanisms described by Bloom et al. (2021) for each firm in each year. It is calculated thorough the median of export unit value regression residuals with the opposite sign for price competition products. The advantage of this empirical approach is that it allows to identify the contribution for each exported product – destination country combination to the aggregate international managerial quality variable, and to test the LBE existence. Nevertheless, it is not possible to calculate the international managerial quality variable for non-exporting firms, hence this paper does not contribute to self-selecting into exporting literature.

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[3] Wagner (2007) indicates that empirical evidence underlines self-selection into exporting market mechanisms (just the more productive firms are able to export), but there is no conclusive proof that exports enhance productivity. Nevertheless, later studies like De Loecker (2013) for Slovenia, Tse et al. (2017) for China, and Fernandez and Isgut (2015) for Colombia report positive evidence for LBE.

[4] De Loecker (2013) points out strategic decisions pertinent to innovativeness, production capability, and human capital, while Hovhannisyan and Mendez and Nune (2019) focuses on workers training.

[5] Colombia is the third exporting coffee country in the world, however, most of the high-quality Colombian coffee is exported and Colombian people drink low quality imported coffee: https://www.bbc.com/mundo/noticias-america-latina-51622198.

[6] Theoretically, Borcherding and Silberberg (1978) show that introduction of a third good could vitiate the Alchian – Allen theorem validity. Empirically, Lawson et al. (2006) do not find evidence of this theorem based on daily sales information at a single gasoline station which sold three gasoline types.

This paper proceeds as follows. The next section includes the theoretical framework, section III shows the data, section IV describes the steps to calculate the international managerial quality and the firms' performance regression, section V present the results and section VI concludes.

2 Theoretical framework

Bloom et al. (2021) is the most recent theoretical approach to describe trade and management dynamics. Their baseline model makes some standard assumptions about variety's demand for representative consumer, and foreign countries expenditure for each good. Also, the model assume that each firm receive an exogenous managerial ability $\varphi \epsilon (0, \infty)$ from distribution $g(\varphi)$ at the firm level, and an i.i.d vector firm-product specific expertise levels $\lambda_i \epsilon (0, \infty)$ from distribution $z(\lambda)$. It is supposed that managerial ability is equal to TFP. Finally, φ level determines the *production efficiency* (ability to assemble inputs into final goods) and *quality capacity* (capacity to make high-quality goods).

Then, it is assumed that producing one unit of physical output requires $(\varphi\lambda_i)^{-\delta}$ units of labor with wage normalized to 1. Also, firms can produce one quality unit $q_i(\varphi, \lambda_i) = (\varphi\lambda_i)^{\theta}$ at a marginal cost of $(\varphi\lambda_i)^{\theta-\delta}$ workers. δ measures the degree to which good management lowers input requirements, and θ reflects the management magnitude skill to enhance firms' capacity to produce higher quality goods. The firms profit maximization leads to the next optimal export price of good *i* to destination country *j:*

$$p_{ji}(\varphi, \lambda_i)^* = \frac{\tau_j(\varphi\lambda_i)^{\theta-\delta}}{\alpha} \qquad (1)$$

where τ_j are *j*'s country iceberg trade cost, and α is the CES exponent of the consumer utility function. The difference between θ and δ will determine the optimal export price charged by the firm. If $\theta = 0$ and $\delta > 0$, effective management improve firm's efficiency but not quality and the optimal price will decrease. If $\theta > 0$ and $\delta = 0$, management improves product quality and the optimal price will increase. Finally, when $\theta > 0$ and $\delta > 0$, both management mechanisms are active, and the export price will vary based on which parameter is larger.

Examples of management policies that increase production efficiency include "optimizing inventory control, synchronizing and monitoring production targets across manufacturing stages, reducing wastage, incentivizing workers, etc" (Bloom et al. 2021, p.7), and strategies that upgrade quality capacity measured in the parameter θ cover "tightening quality control, facilitating specialized assembly, minimizing costly mistakes, etc" (Bloom et al. 2021, p.3). Intuitively, the managerial knowledge stock that allows to implement these tactics in a successful way is what the literature has referred as organizational capital, a non-traditional intangible asset that has been broadly defined[7].

The methodological section of this paper does not estimate directly any Bloom et al. (2021) parameters or test any of their testable predictions, but incorporates the concept that better international managed firms rise their *production efficiency* and *quality capacity* mechanisms. The key assumption is that good managers maximize production efficiency when the exported price for the goods that compete in the international market by price is minimized given the firms capabilities (as the negative relationship between p_{ji} and δ suggest), and the quality capacity is maximized when the exported price for the goods that compete in the international market by quality is maximized (as the

[7] *On one hand, Dessein and Prat (2019) define organizational capital as an intangible productive asset that can be produced only with the firm's top management leadership input, including: i) relational contracts, ii) corporate culture, iii) firm-specific human capital, or iv) firm capabilities. On the other hand, Black and Lynch (2005) define the organizational capital as firm's organizational structure that contributes to the productive capacity, including: work force training, employee voice, and work design (including the use of cross-functional processes).*

positive relationship between p_{ji} and θ suggest). This assumption follows the direction of the correlation between the three parameters (p_{ji}, δ, θ) described in the optimal price equation 1, but it is different from original Bloom et al. (2021) approach who consider and estimated δ and θ as firm-invariant structural parameters.

3 Data

The sample used in this paper is a merge of the next two Colombian datasets:

- Customs data: Exports (imports) disaggregated at HS 10-digit product - country destination (origin)- firm id level. It includes traded value and exported/imported quantity. The information was provided by the Colombian National Administrative Statistics Department (DANE by the acronym in Spanish). The imported and exported value were deflated based on the US GDP deflator (2014 is the base year). Nominal trade values match with the values reported by UN Comtrade.
- *Big private firms' financial statements*: The Business Information and Reporting System (SIREM by the Spanish acronym) reports the financial statements (balance sheet, income statement, and cash flow) for the supervised firms by the Colombian Companies Superintendence. The principal criteria to supervise a firm is that its total assets or operating income is larger than 30,000 current legal Colombian minimum wages. The published information passed internal validation process defined by the entity. One limitation of this dataset is that it does not include total number of employees, so, operating expenses is used as proxy variable[8]. The variables used in this dataset were deflated using an industrial-specific annual Producer Price Index (PPI) reported by the Colombian Central Bank (2014 is the base year).

Figure 1 and 2 show the historical participation of big private Colombian exporting firms relative to total exporting firms and total exported value. On annual average, big exporting firms represent 34% of total exporting firms (around 3,825 of 11,250 firms per year) and 59% of total exported value. Also, big private Colombian exporting firms export higher value, export more products, export more products to more country destinations, and report lower export concentration than other exporting firms (see appendix table 2). Additionally, big private exporting firms have larger fixed assets, larger operating income, and larger non-tangible assets than big private firms that do not export (see appendix table 3). In conclusion, the sample used in this paper cover the biggest private Colombian firms in terms of size (assets, operating income), export value and extensive margin measures.

[8] *The Colombian Ministry of Health shared the Colombian payroll data (PILA, by the acronym in Spanish) for the big private Colombian exporting firms included in this paper with a fake firm-id. Therefore, it was not possible to merge it with the databases described above.*

Figure 1: **Total Colombian exports disaggregated by firm classification**

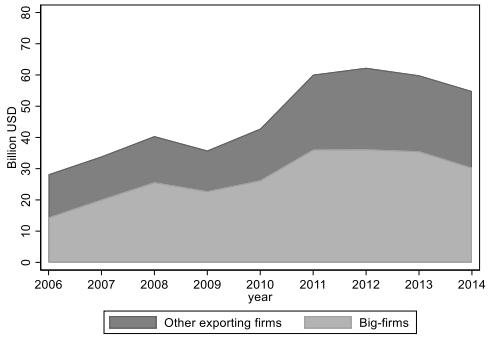
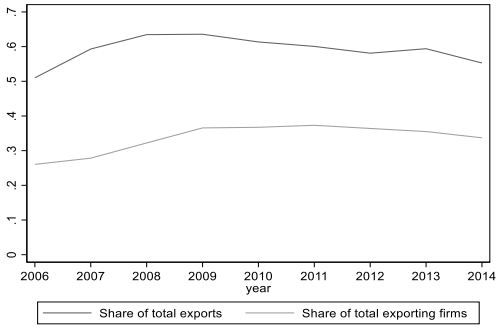


Figure 2: **Big exporting Colombian firms relative to total exporting firms**



Source: Colombian National Administrative Statistics Department (DANE by the acronym in Spanish), Colombian Companies Superintendence and own calculations.

4 Methodology

The international managerial quality is computed as the median of the export unit value regression residuals for each firm in each year, with the opposite residual sign for those markets that compete in the international market by price. Basically, the fraction of the export unit value not attributable to a set of firm characteristics, destination country's characteristics, and a group of fixed effects is used as proxy variable of quality manager's strategies and manager's organizational capital contribution to maximize: i) *quality capacity*: the higher residual, the better management for the quality competition products, and ii) *production efficiency*: the lower residual, the better management for the price competition products. Then, this international managerial quality variable is included as explanatory variable in international firms' performance and LBE regressions. The steps of the methodology are described below.

4.1 Classifying markets as price or quality competition

Baldwin and Ito (2011) classify markets based on an export unit value regression for each HS 6 digit, in which destination country's GDP, destination country's GDP per capita, distance between exporter and importer and year fixed effects are included as explanatory variables, using customs data for each of the world's top 8 exporters plus Australia. The distance coefficient will indicate if the market competes internationally by price or quality. The theoretical foundation to use distance as the key determinant variable is that traditional heterogeneous firm trade models, like Melitz (2003), state that higher productivity firms produce cheaper goods, while the qualitative heterogeneous firm trade model predicts that more productive firms sell more expensive goods. As only the more productive firms find profitable to serve more remote destinations, the distance will indicate if the good is competing internationally by price (negative distance coefficient) or by quality (positive distance coefficient). Finally, Baldwin and Ito (2011) clarify that detailed export price information at firm level is not used because "*the distance-price-gradient prediction stems from product/firm selection, not from firms' pricing behavior*." (Baldwin and Ito, 2011, p.114), so the unit of observation for each regression is HS 6 digit - destination country.

This paper adds three novelties to Baldwin and Ito (2011) market classification methodology. First, it was included a dummy variable indicating if the destination country is contiguous to Colombia due to strong Colombia's political tensions with neighbor countries for those years, which had important economic consequences. Then, the next regression was estimated for each market HS 6-digit:

$$ln\ Unit\ value\ (UV)_{pkt} = \beta_o + \beta_1 ln\ distance_{kt} + \beta_2 GDP_{kt} + \beta_3 GDPpc_{kt} + \beta_4 Contiguity_{kt} + \partial_y + \epsilon_{pkt} \quad (2)$$

where p is HS 10 dig product, k is destination country, and ∂_y are year fixed effects. Secondly, the HS disaggregation of the unit of observation for each regression (HS 10 dig product – destination country) is higher than original Baldwin and Ito (2011) HS disaggregation (HS 6 dig product – destination country), in order to increase the probability to get a significant distance coefficient as each regression is estimated with a larger sample size (since Colombia exports each good to fewer countries than world's top exporters). Additionally, the same export unit value regression was estimated for broader market aggrupation (HS 5-digit, HS 4-digit, HS 3-digit, and HS 2-digit), and then, markets (HS 6 digit) were classified according to the most disaggregated regression in terms of the HS aggrupation level, in which the distance coefficient was significative. The market classification is more precise as the regression aggrupation level is more disaggregated (HS - 6 dig is preferable than HS - 5 digit), but it is less likely to get a significative distance coefficient because the sample for each regression is smaller. This modified methodology allows to classify all markets -compared to Baldwin and Ito (2011)- and still takes advantage of the highly disaggregation Colombian customs data characteristics, as the unit of observation for all regressions is HS 10 dig product – destination country.

In total, it was estimated 9,812 regressions where 20% of the markets were classified at the initial HS 6-digit aggrupation level, 10% with HS 5-digit, 23% at the HS 4-digit, 29% at the HS 3-digit, 9.2% at the HS 2 digit and the remaining 9.5% using the whole sample regression (see table 1). The final results indicate that 53% of the markets were classified as quality competition and 47% as price competition. Under this classification, the share of the quality competition products' export value relative to total exported value for the big private Colombian firms oscillated around 18%, and the trend decreased during the analyzed sample (Figure 3).

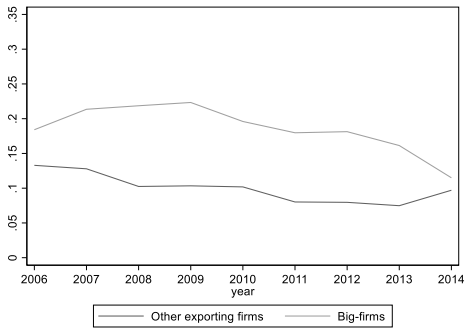
Table 1: **Markets classification (price or quality competition)**

Group HS level per regression	Number of markets classified*	Percentage of markets classified	Number of regressions	Median observations per regression	Average observations per regression
HS6-dig	962	19.62	4,904	25	63
HS5-dig	468	9.54	3,418	50	128
HS4-dig	1,135	23.14	1,218	216	456
HS3-dig	1,421	28.98	174	1,731	2,535
HS2-dig	454	9.26	97	4,126	8,346
Whole sample	464	9.46	1	297,724	297,724

Classification	Number of markets	Percentage of markets
Price competition	2,310	47.1
Quality competition	2,594	52.9
Total	4,904	100

*The markets classified as price (quality) competition are those whose distance coefficient is significant negative (positive) in equation 2.

Figure 3: **Quality competition products exports relative to total exports**



Source: Colombian National Administrative Statistics Department (DANE by the acronym in Spanish), Colombian Companies Superintendence and own calculations. The product classification follows the methodology explained in section IV.1.

4.2 International managerial quality estimation

Once the markets are classified as price or quality competition, it is estimated the export unit value (EUV) regression described in equation 3. The main objective of this regression is to calculate the residuals as accurately as possible, not to analyze the impact of a particular variable on export unit value, whereby gravity variables were replaced by destination country fixed effects. The baseline regression is:

$$ln\,EUV_{pfkt} = \beta_o + \beta_1 ln\,GDP_{kt} + \beta_2 ln\,GDPpc_{kt} + \beta_3 tf_{p*kt} + \Gamma X_{ft} + \theta New_{ftkp} + \varphi Number\_p\_k_{ftkp} + \partial_k + \partial_p + \partial_y + \partial_f + \epsilon_{pfkt} \quad (3)$$

where p: HS 10-digit product, p*: HS 6-digit product, f: firm, k: destination country, t: year. $ln\,GDP_{kt}$ and $ln\,GDPpc_{kt}$ are destination country variables that vary over time (GDP and GDP per capita). $Tariff_{p*kt}$[9] is the ad-valorem import tariff imposed by destination country *k* to product p* (6-digit level). The firm level variables include log fixed assets, log operating expenses, log non-tangible assets, mark-up and TFP[10]. New_{ftkp} includes three independent and mutually exclusive dummies which identify new export decisions made by firm f in year *t* to control for the adjustment cost of innovating: i) if it is a new product *p* exported to an "old" country destination *k*, ii) if it is an "old" product *p* exported to a new country destination *k,* or if iii) it is a new product *p* exported to a new country destination *k*. $Number\_p\_k_{ftkp}$ include the number of products that firm f export in year *t*, the number of destination countries where the firm f export in year *t*, and the number of product-destination countries that firm *f* export in year *t.* Finally, ∂_k are destination country fixed effects, ∂_p are HS 10-digit product fixed effects, ∂_f are firm fixed effects, and ∂_y are year fixed effects. Robust standard errors are clustered at country destination – year level.

The baseline export unit value regression is shown in column 1 of table 2. Columns 2, 3 and 4 of table 2 add larger number of fixed effects to the baseline model, including double and triple interactions between destination country, product, year and firm variables. Each column will generate four different international managerial quality variables abbreviated as IMQ1, IMQ2, IMQ3, and IMQ4. As the international managerial quality variable is intended to calculate firm-level variation in manager's organizational capital contribution to increase production efficiency and quality capacity of the exported products by the firm across years, the additional fixed effects do not absorb this variation because none

[9] *Tariff data provided by Felbermayr et al. (2019). Product level aggregation is HS 6-digit.*

[10] *TFP estimation follows Mollisi and Rovigatti (2017) methodology, who use a dynamic panel instruments a la Blundell-Bond based on Wooldridge (appendix table 4A shows the estimation).*

of them is defined as the combination of firm id with a time changing variable. These additional fixed effects control for unobserved characteristics of particular combinations between product, year, destination country and firm, which are exogenous from manager's control but could impact the export unit value. This helps to reduce the potential omitted variable bias.

Later, vector $\hat{v}_{pkft}$ is defined as described in equation 4 based on equation 3 residuals ($\hat{\epsilon}_{pkft}$). Once the vectors $\hat{v}_{pkft}$ are ascending ordered for each firm-year, the international managerial quality is calculated as the median of $\hat{v}_{pkft}$ for each firm f in year t (equation 5A and 5B):

$$\hat{v}_{pkft} = \begin{cases} \hat{\epsilon}_{p1kft}, & p1 \text{ is the set of quality competition products exported by firm } f \text{ in year } t \\ (\hat{\epsilon}_{p2kft} * -1), & p2 \text{ is the set of price competition products exported by firm } f \text{ in year } t \end{cases} \quad (4)$$

$$International\ managerial\ quality\ (IMQ)_{ft} = \frac{n+1^{th}}{2}\ obs\ (\hat{v}_{pkft})\ \ for\ odd\ data \quad (5A)$$

$$International\ managerial\ quality\ (IMQ)_{ft} = \frac{\frac{n^{th}}{2}+(\frac{n}{2}+1)^{th}}{2}\ obs\ (\hat{v}_{pkft})\ \ for\ even\ data \quad (5B)$$

The residuals $\hat{v}_{pkft}$ are aggregated by the median to not bias the calculation with outliers, evading to define a good manager as the one who is able to guide the firm to export some products high above its capabilities but others far below. Nevertheless, firms' performance regressions results are calculated when the residuals $\hat{v}_{pkft}$ are aggregated by the simple average as robustness check.

Figure 4 shows the binned scatter plots between international managerial quality (IMQ4) in the x-axis, and six different firm's trade outcomes in the y-axis. The binned scatter plots are graphed with the IMQ4 in the x-axis, which is the international managerial quality obtained from the fourth export unit value regression residuals (table 2), because it is the one with the lowest potential omitted variable bias. Most of the flat fit lines indicate that simple correlation between IMQ4 and exported value, number of exported products, number of destination countries' exports, number of export products - destination countries, and input prices is null. Profit rate is the only dependent variable that has a positive simple correlation with IMQ4, suggesting that better international managed firms are more profitable. Additionally, figure 5 shows that IMQ4 is not related with firm level independent variables that were used to construct it (operating expenses, fixed assets, non-tangible assets and TFP), which provides evidence of the IMQ4 exogeneity and that there is no multicollinearity in the export performance regressions explained in the next section.

Table 2: **Export unit value regression**

VARIABLES	(1) Log Export Unit Value	(2) Log Export Unit Value	(3) Log Export Unit Value	(4) Log Export Unit Value
Log GDP	-0.0507	-0.00927		
	(0.104)	(0.103)		
Log GDPpc	0.0523	0.0627		
	(0.129)	(0.123)		
Applied tariff (ad valorem component)	-0.00144	0.000382	0.000522	
	(0.000883)	(0.000942)	(0.00121)	
Log real stock non-tangible assets (USD)	0.00106***	0.000614*	0.000403	0.000179
	(0.000392)	(0.000355)	(0.000317)	(0.000385)
Log real stock property, plant and equipment (USD)	0.00275	0.00178	0.000163	-0.000440
	(0.00264)	(0.00237)	(0.00217)	(0.00252)
Log real operating expenses (USD)	-0.00624	-0.0102*	-0.0128**	-0.0149**
	(0.00649)	(0.00600)	(0.00531)	(0.00582)
TFP	-0.00272	-0.00980	-0.0151	-0.0173
	(0.0156)	(0.0142)	(0.0130)	(0.0143)
Mark-up (operating income / sales cost)	0.00149**	0.00408	0.00256	0.00375
	(0.000602)	(0.00317)	(0.00299)	(0.00309)
Dummy new product	-0.0143**	0.0262*	0.0474***	
	(0.00713)	(0.0137)	(0.0157)	
Dummy new destination	0.0609***	0.0306***		
	(0.0100)	(0.00937)		
Dummy new product-destination	0.00835			
	(0.0133)			
Number of exported country destinations	0.000451	0.000525	0.000159	-0.000450
	(0.00142)	(0.00118)	(0.00107)	(0.00124)
Number of exported products	-0.000612	0.000511	0.000665*	0.000471
	(0.000461)	(0.000351)	(0.000374)	(0.000464)
Number of exported product-destinations	-0.000192	-0.000416***	-0.000415***	-0.000319***
	(0.000118)	(9.50e-05)	(9.78e-05)	(0.000108)
Observations	445,447	375,852	368,622	230,214
R-squared	0.749	0.896	0.910	0.931
Country destination fixed effects	Yes	Yes	Yes	Yes
Product fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Product- firm fixed effects	No	Yes	Yes	Yes
Product- country destination fixed effects	No	Yes	Yes	Yes
Product- year fixed effects	No	Yes	Yes	Yes
Firm- country destination fixed effects	No	No	Yes	Yes
Product- firm- country destination fixed effects	No	No	No	Yes

Robust standard errors clustered at country destination - year in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Figure 4: **Binned scatter plots international managerial quality 4 and firm performance measures**

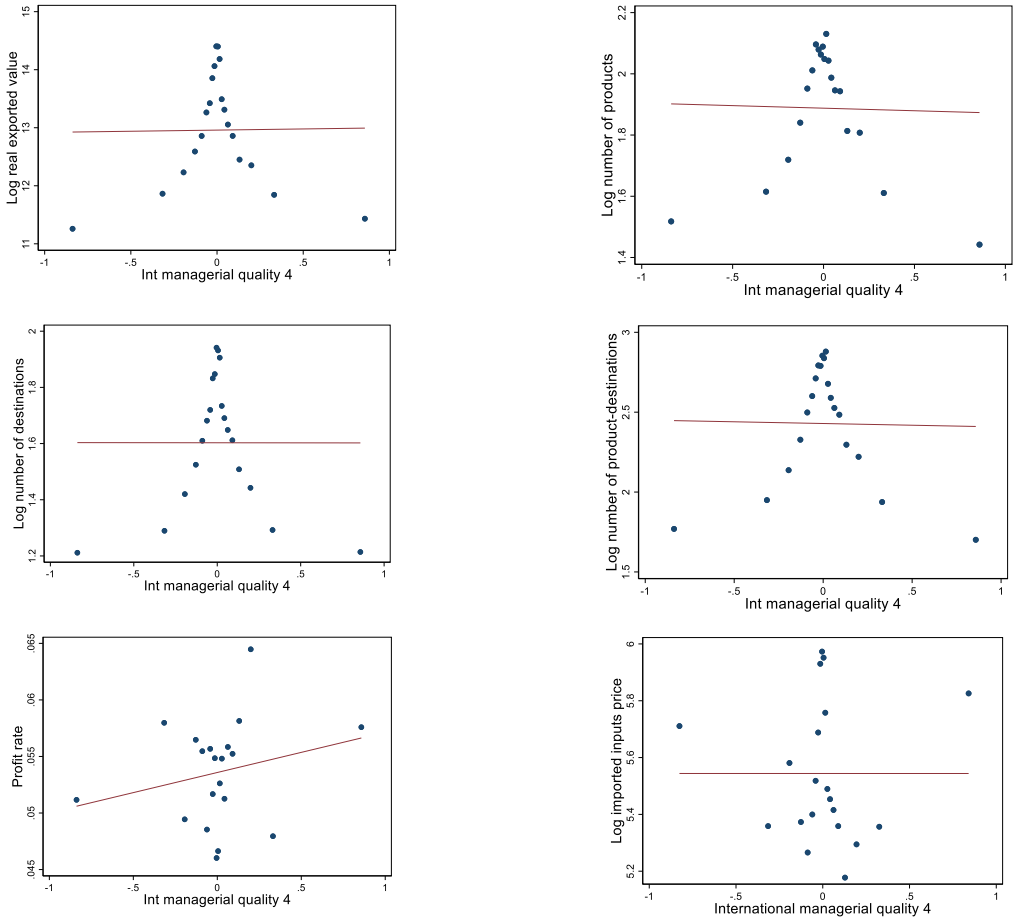
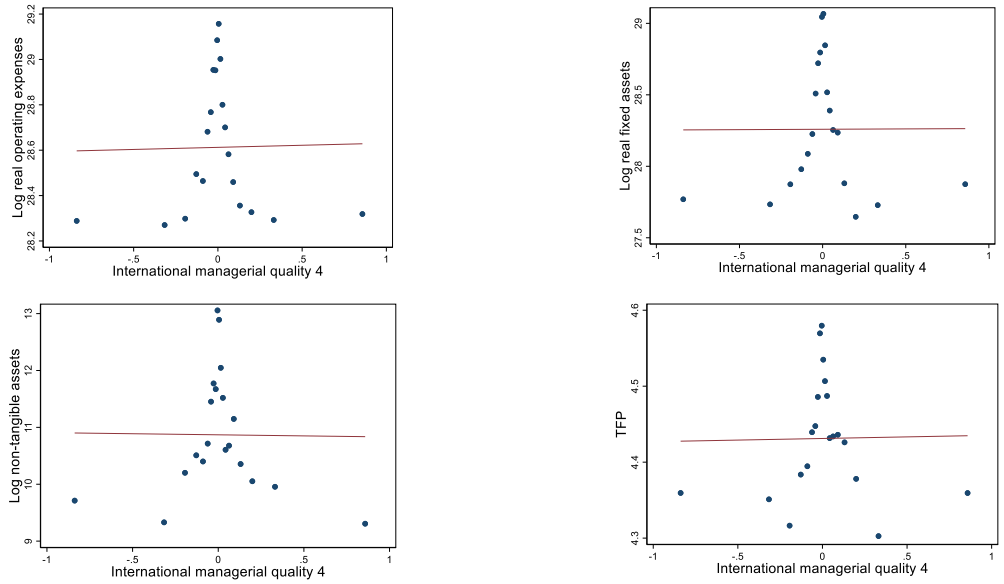


Figure 5: **Binned scatter plots international managerial quality 4 and explanatory variables**



4.3 International firm performance regression

The firms' performance baseline regression is:

$$log\, Y_{ft} = \beta_o + \beta_1 Int\_management\ IMQ4_{ft} + \beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy} \qquad (6)$$

where firm outcome (Y) include: i) log exported value, ii) number of exported products, iii) number of export country destination, iv) number of exported products-country destinations, v) HHI exports, vi) profit rate, and vii) simple average of imported inputs unit value. $Int\_management\ IMQ4_{ft}$ is the international managerial quality described in equation 5 estimated with the residuals obtained from the fourth export unit value regression. X_{ft} is a vector of firm-level characteristics including log fixed assets, log non-tangible assets, log operating expenses, and TFP clean of international management component[11]. ∂_f are firm fixed effects, ∂_s are sectoral fixed effects (CIIU 3 digit), ∂_y are year fixed effects, and ∂_{ys} are sectoral-year fixed effects to control for sectoral cycles in the local economy.

One interesting analysis that academic papers relating management quality and trade outcomes have not included is to compare how firm's international performance react to endogenous changes in the firm internal conditions relative to exogeneous changes in the international market. For this purpose, $ln\ Ext\ Demand\ exp_{ft}$ is included in the equation 6 as explanatory variable, which capture the degree to which the international market is demanding the products exported by the firm (exogenous from firm manager decisions). It is defined as $ln\ Ext\ Demand \exp products_{ft} = \sum_{kp} \ln(ID_{kpt}) share\_exp_{p,t=0}$, where $share\_exp_{p,t=0}$ is the share of product *p* exported to country *k* in total exports of firm *f* in the first firm year sample, and ID_{kpt} is the import demand of country *k* of product *p* in year *t* excluding Colombian exports. The graph 1A (appendix) shows that exogenous external shocks are not correlated with endogenous international managerial quality, and Table 5A (appendix) present descriptive statistics for all variables included in the regressions.

Two issues emerge from this econometric specification. First, IMQ *could* be measured with error because it is calculated based on export unit value regression residuals, which *could* be capturing international managerial quality plus other omitted variable(s). As far as I know, there is no computational way to estimate econometric models correcting the measurement error of one independent variable including four fixed effects[12]. For this reason, the baseline results of the export performance regressions were calculated with IMQ4, which is the international managerial quality variable with higher probability to minimize this *potential* measurement error problem, however, several robustness checks were calculated replacing IMQ1, IMQ2, and IMQ3 by IMQ4 in equation 6.

Also, standard errors should be corrected because IMQ was obtained from one regression (export unit value, table 2) estimated separately from the export performance regression (equation 6). As far as I know, there is no computational way to estimate bootstrap standard errors for equation 6, since it includes four fixed effects. However, there is an alternative way to estimate bootstrap standard errors just for coefficient β_1 in equation 6. It is estimated a regression where the dependent variable is the residual of a regression of Y on the other equation 6 explanatory variables ($\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$), and the independent variable is the residual of a regression of IMQ4 on the other equation 6 explanatory variables ($\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$), which will estimate the same β_1 coefficient of equation 6 and on which is possible to bootstrap standard errors. These bootstrap errors are compared with the robust standard errors clustered at firm level of the baseline model.

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[11] It is calculated as the residual of a regression of TFP on international managerial quality (no controls, no fixed effects), following Bloom et al. (2021).

[12] The command eivreg and xtewreg corrects the econometric models when there is one or more independent variables measured with error under different reliability percentages assumptions. However, these commands do not allow to include four fixed effects.

Additionally, it was included two placebo tests as robustness check of the IMQ impact on firms' international performance: firms' equity was included as dependent variable in equation 6 and the IMQ was calculated with the residuals of the log imported unit value (see table 6A), instead of log exported unit value (without changing the sign for price competition products). In both cases, the IMQ should not have any explanatory power on firm's performance measures, whereby those β_1 coefficients should be non-significant.

4.4 Learning by exporting (LBE)

LBE is one potential transmission channel by which firms could improve managerial practices due to its international market exposure. The next regression would indicate if better international managed firms in *t-1* learn by exporting and improve the production process for each exported good in *t*:

$$\hat{v}_{pkft} = \beta_o + \beta_1 International\ Managerial\ Quality_{ft-1} + \Gamma X_{ft} + \partial_f + \partial_p + \partial_k + \partial_y + e_{pfkt} \qquad (7)$$

where $\hat{v}_{pkft}$ is the residuals vector defined in equation 4. Also, additional set of firm controls (X_{ft}) and fixed effects ($\partial_f, \partial_p, \partial_k, \partial_y$) were included using the same definition of previous sections.

5 Results

Table 3 shows international firm's performance regression estimation (equation 6). In first place, the results indicate that 1% increase in the international managerial quality variable rises 0.0614% the firm exported value and decreases 0.0208% the number of exported products. That is, better international managed firms in the short run led to an organizational capital investment focused in the goods that the firm already exported, raising its exported value. This result should not be understood as a support of the anti-variety effect found by Baldwin and Forslid (2010) for small countries, but as a successful prioritization manager's strategy to insert firm's products in the international market; it is more profitable (as the positive and significant IMQ4 coefficient on profit rate illustrates) to export fewer products with a higher manager organizational capital investment, than exporting a higher number of products without having maximized the production efficiency and quality capacity involved in their production process.

The positive IMQ4 impact on exported value and negative IMQ4 impact on number of exported products hold up to several robustness tests in equation 6: replacing IMQ1 by IMQ4 (table 7A), replacing IMQ2 by IMQ4 (table 8A), replacing IMQ3 by IMQ4 (table 9A), IMQ4 calculated when the export unit value residuals are aggregated by the simple average (table 10A), IMQ4 calculated when the export unit value residuals are aggregated by the simple average and multiplied by the export share relative to operating income (table 11A), and IMQ4 calculated with the median of the residuals when TFP is excluded from the export unit value regression (table 12A). Nevertheless, the positive impact of IMQ on profit rate is not significant in all these robustness results.

Also, the placebo tests performed well because IMQ4, IMQ1, IMQ2 and IMQ3 do not report any significant effect on firms' equity in any of the calculations (column 8 of tables 3, 7A, 8A, 9A, 10A, 11A and 12A), and IMQ4 does not report any significant effect on any export firm's performance dependent variable when it is calculated with the imported unit value regression residuals (see table 4 for results, and table 6A for imported unit value regression). Likewise, the principal results are significative when the robust standard errors are bootstrapped with 1000 replications (table 5) and 5000 replications (table 6).

In comparative terms, figure 6 shows that IMQ coefficients are larger but statistically equal to the coefficient that measure the magnitude to which the international market is demanding the products

exported by the firm on total exported value. This indicates that endogenous improvements in the international managerial quality are as important as exogeneous positive international market conditions to boost firm exports.

On another note, IMQ coefficients are lower in absolute value than fixed assets, operating expenses and TFP (clean of international management component) coefficients for most of the dependent variables in most of the econometric specifications. This indicates that variables which explain self-selecting into exporting are more relevant international firms' performance determinants than international managerial quality. Also, TFP (clean of international management component) and fixed assets investment are more important profit rate determinants than international managerial quality, which is expected since international managerial quality only impact firm's international income and the average share of exported value relative to operating income is just 0.36. Besides, non-tangible asset is the less relevant international firms' performance determinant, which indicates that non-traditional intangible assets, as the organizational capital measured in the IMQ variable, is a more important variable to explain international firm's performance than traditional non-tangible assets measured in the accounting system (trademarks, patents, concessions and franchises, rights, know-how).

Finally, table 7 shows the LBE regression estimation (equation 7). The results indicate that IMQ1 has a positive effect in the future export unit value regression residuals, which proofs LBE existence: better international managed firms learn how to export and they do it better the next year. Nevertheless, the results are not robust to different IMQ variables (LBE results for IMQ2 can be found in table 13A, IMQ2 in table 14A, and IMQ4 in table 15A). These findings point that fixed effects included in the IMQ2, IMQ3 and IMQ4 calculation are absorbing the LBE effect. That is, product-firm fixed effect could absorb if firms are more likely to learn by exporting just particular products, and destination country-firm fixed effect could absorb if the firms are more likely to learn by exporting to specific countries.

Table 3: **International managerial quality 4 impact on firm's performance**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 4	0.0614**	-0.0208**	0.00428	-0.0206**	0.00379	0.00372*	-0.00505	-0.00758
	(0.0261)	(0.00914)	(0.00630)	(0.0103)	(0.00444)	(0.00199)	(0.0423)	(0.00833)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0380***	0.0278***	0.0194***	0.0369***	-0.00961***	-0.000179	0.0122**	0.00168
	(0.00523)	(0.00182)	(0.00142)	(0.00228)	(0.000780)	(0.000273)	(0.00519)	(0.00145)
Log real stock property, plant and equipment (USD)	0.118***	0.0229***	0.0215***	0.0369***	-0.00467***	0.00837***	0.131***	0.0680***
	(0.0316)	(0.00750)	(0.00556)	(0.0102)	(0.00136)	(0.00307)	(0.0155)	(0.0163)
Log real stock non-tangible assets (USD)	0.00292**	0.00147***	0.000876**	0.00152**	-0.000285	8.58e-06	0.00147	0.00251***
	(0.00115)	(0.000531)	(0.000353)	(0.000601)	(0.000185)	(7.88e-05)	(0.00193)	(0.000533)
Log real operating expenses (USD)	0.282***	0.0535**	0.0507***	0.0879***	-0.0128***	0.0155	0.285***	0.127**
	(0.101)	(0.0235)	(0.0172)	(0.0324)	(0.00313)	(0.00968)	(0.0366)	(0.0508)
TFP (excluding int managerial quality component)	0.708***	0.124**	0.112***	0.203***	-0.0312***	0.0515**	0.703***	0.296**
	(0.246)	(0.0567)	(0.0418)	(0.0783)	(0.00755)	(0.0235)	(0.0897)	(0.123)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.901	0.870	0.895	0.898	0.762	0.592	0.698	0.968
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial quality component) is the residual of a regression of TFP on international managerial quality 4 (no controls, no fixed effects). *** p<0.01, ** p<0.05, * p<0.1

Table 4: **International managerial quality 4 impact on firm's performance lacebo test: international managerial quality constructed with the residuals of the imported unit value regression (see table 6A)**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 4 (constructed with the residuals of the imported unit value regression, see table 6A)	-0.0487	-0.0176	-0.0165	-0.0264	0.00623	0.00235	0.504***	0.00334
	(0.0372)	(0.0164)	(0.0145)	(0.0201)	(0.00846)	(0.00289)	(0.0825)	(0.0154)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0408***	0.0300***	0.0198***	0.0381***	-0.00913***	-0.000381	0.0118**	6.79e-05
	(0.00581)	(0.00209)	(0.00162)	(0.00260)	(0.000908)	(0.000240)	(0.00484)	(0.00137)
Log real stock property, plant and equipment (USD)	0.168***	0.0386***	0.0324***	0.0551***	-0.00495***	0.0163***	0.147***	0.113***
	(0.0146)	(0.00510)	(0.00395)	(0.00599)	(0.00179)	(0.00171)	(0.0154)	(0.00851)
Log real stock non-tangible assets (USD)	0.00188	0.00168***	0.000841**	0.00163**	-0.000342*	3.03e-05	0.00173	0.00204***
	(0.00125)	(0.000599)	(0.000383)	(0.000667)	(0.000205)	(7.76e-05)	(0.00188)	(0.000509)
Log real operating expenses (USD)	0.447***	0.111***	0.0832***	0.152***	-0.0126***	0.0373***	0.333***	0.254***
	(0.0375)	(0.0131)	(0.0102)	(0.0154)	(0.00456)	(0.00400)	(0.0366)	(0.0197)
TFP (excluding int managerial quality component)	1.094***	0.259***	0.182***	0.349***	-0.0313***	0.106***	0.827***	0.619***
	(0.0951)	(0.0314)	(0.0258)	(0.0380)	(0.0110)	(0.00998)	(0.0870)	(0.0500)
Observations	14,542	14,542	14,542	14,542	14,542	14,542	14,542	14,316
R-squared	0.908	0.869	0.904	0.903	0.759	0.663	0.725	0.971
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial quality component) is the residual of a regression of TFP on international managerial quality 4 (no controls, no fixed effects).

*** p<0.01, ** p<0.05, * p<0.1

Table 5: **International managerial quality 4 residual impact on firm's performance residual, bootstrap standard errors (number of replications = 1000)**

VARIABLES	(1) Log exported value (residual)	(2) Log No. exported products (residual)	(3) Log No. destination countries (residual)	(4) Log No. products-destination countries (residuals)	(5) HHI exports residuals	(6) Profit rate (residuals)	(7) Log average unit value imported products (residuals)	(8) Total equity (P*) (residuals)
International managerial quality 4 (residuals)	0.0614**	-0.0208**	0.00428	-0.0206**	0.00379	0.00372**	-0.00505	-0.00756
	(0.0240)	(0.00866)	(0.00573)	(0.00983)	(0.00396)	(0.00154)	(0.0344)	(0.00773)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of replications	1000	1000	1000	1000	1000	1000	1000	1000

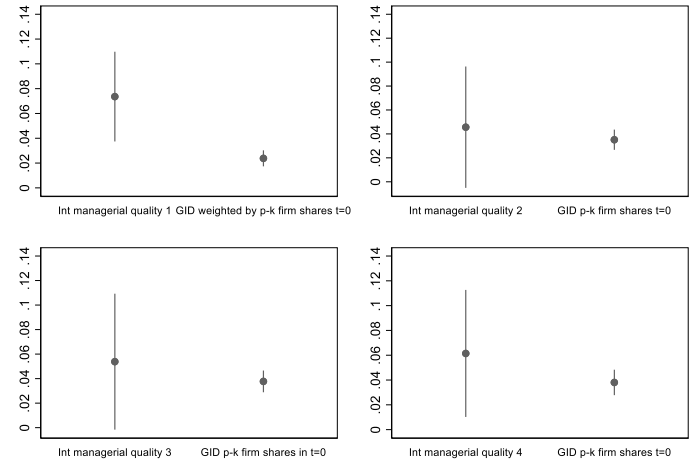
Note: Bootstrap errors in parentheses. Constant no reported. Dependent variables are the residual of a regression of each Y on $\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$, and the independent variable is the residual of a regression of International Managerial Quality 4 on $\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$ (see equation 6). *** p<0.01, ** p<0.05, * p<0.1

Table 6: **International managerial quality 4 residual impact on firm's performance residual, bootstrap standard errors (number of replications = 5000)**

VARIABLES	(1) Log exported value (residual)	(2) Log No. exported products (residual)	(3) Log No. destination countries (residual)	(4) Log No. products-destination countries (residuals)	(5) HHI exports, residuals	(6) Profit rate (residuals)	(7) Log average unit value imported products (residuals)	(8) Total equity (P*) (residuals)
International managerial quality 4 (residuals)	0.0614**	-0.0208**	0.00428	-0.0206**	0.00379	0.00372**	-0.00505	-0.00756
	(0.0245)	(0.00881)	(0.00585)	(0.00975)	(0.00398)	(0.00157)	(0.0345)	(0.00769)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of replications	5000	5000	5000	5000	5000	5000	5000	5000

Note: Bootstrap errors in parentheses. Constant no reported. Dependent variables are the residual of a regression of each Y on $\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$, and the independent variable is the residual of a regression of International Managerial Quality 4 on $\beta_2 ln\ Ext\ Demand\ exp_{ft} + \Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy} + v_{fy}$ (see equation 6). *** p<0.01, ** p<0.05, * p<0.1

Figure 6: **Relative importance of international managerial quality and exogenous international demand shocks on export performance**



GID: Global Import Demand (excluding Colombian exports), p: HS-10 digit product, k: destination country

Note: this graph shows the 95% confidence interval of the international managerial quality and global import demand weighted by p-k at t=0 (at the firm level) coefficients on log exported value regression for the four managerial quality variables. $\Gamma X_{ft} + \partial_f + \partial_s + \partial_y + \partial_{sy}$ are included as other explanatory variables in the regression (see equation 6).

Table 7: **Learning by exporting regression (IMQ1)**

	(1)	(2)
VARIABLES	EUV residuals	EUV residuals
International managerial quality 1, t-1	0.0391***	0.0387***
	(0.0137)	(0.0137)
Log Real Stock Non-tangible assets (USD)		0.000390
		(0.000439)
Log Real Stock Property, plant and equipment (USD)		-0.00650*
		(0.00345)
Log Real Operational expenses (USD)		-0.0155
		(0.00974)
TFP (excluding int management quality component)		-0.0487**
		(0.0222)
Observations	376,724	376,724
R-squared	0.042	0.042
Firm fixed effects	Yes	Yes
Country destination fixed effects	Yes	Yes
Product fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Robust standard errors clustered at firm-level in parentheses. The dependent variable of the regressions are the residuals calculated in the export unit value regression (see table 2) with the opposite sign for the price competition products (equation 4).

*** p<0.01, ** p<0.05, * p<0.1

6 Conclusion

Firms could implement different managerial practices for goods sold in the international market and sold locally, but specialized management quality surveys are not inquiring that difference. In this sense, this paper proposes a new methodology to measure managerial practices quality just for the international market, using a sample of the biggest private Colombian exporting firms between 2006 and 2014. The production efficiency and quality capacity mechanisms described by Bloom et al. (2021) are approximated with the residuals of export unit value regressions, changing the sign for price competition products.

Three interesting results emerge from the econometric analysis. First, higher international managerial quality impacts positively the exported value and profit rate, but negatively extensive margin measures, indicating that better managed firms in the international market make more efficient the production and export process of the goods already exported by the firm. In other words, good managers do not export more, they export better. Secondly, export value elasticity relative to endogenous improvements in the international managerial quality (0.06) is higher but statistically equal to the export value elasticity relative to exogenous changes in the magnitude to which the international market is demanding the products exported by the firm (0.04), indicating that a good manager is as important as favorable external conditions to boost exports. In general, these results are robust to several robustness and placebo tests. Third, there is evidence that better managers learn by exporting. The big caveat of this methodology is that international managerial quality cannot be calculated for non-exporting firms, consequently, it does not contribute to self-selecting into exporting discussion.

These findings highlight important future research topics. First, learning by exporting analysis could be improved if it is analyzed in a theoretical and empirical dynamic framework, that allows to integrate into the international managerial quality calculation the time it takes to fully learn the export process. Secondly, evidence point that non-traditional non-tangible assets (like the organizational capital measured in the international managerial quality) could be more relevant international firms' performance determinant than traditional non-tangible asset measured in the accounting system, consequently, it is suggested further research about non-traditional non-tangible assets role (like firm's culture and structure) on economic growth. Third, it is recommended that specialized management quality survey include questions about international managerial practices and if they learn by exporting (and how). Fourth, it would be enriching merging the sample of this paper with payroll data, because it would allow to estimate international manager quality impact on wage dynamics, manager remuneration and CEO wage gap for a developing country (see Keller and Olney, 2021).

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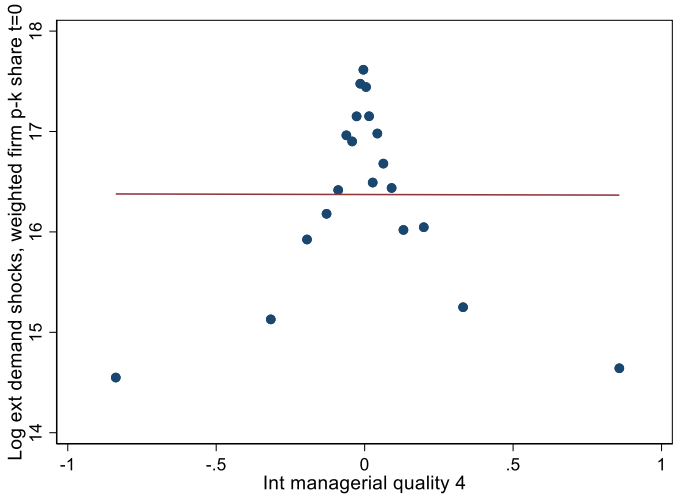
APPENDIX

Graph 1A: **Binned scatter plot between international managerial quality 4 and exogenous international demand shocks**



Note: The y-axis variable is defined as $ln\ Ext\ Demand\exp products_{ft} = \sum_{kp} \ln(ID_{kpt}) share\_exp_{p,t=0}$, where $share\_exp_{p,t=0}$ is the share of product p exported to country k in total exports of firm f in the first firm year sample, and ID_{kpt} is the import demand of country k of product p in year t excluding Colombian exports. International managerial quality 4 is defined as in equation 5.

***Table 1A:* Literature review – 16 most influential business export empirical research**

Num	Paper	Title	Country	Sample
1	Bilkey and Tesar (1977)	The export behavior of smaller-sized Wisconsin manufacturing firms	US	423 small and medium sized Wisconsin manufacturing firms
2	Bonaccorsi (1992)	On the relationship between firm size and export intensity	Italy	Nationwide sample of manufacturing firms
3	Cavusgil (1984a)	Differences among exporting firms based on their degree of internationalization	US	70 midwestern manufacturers (personal interviews with the executives)
4	Cavusgil and Nevin (1981)	Internal determinants of export marketing behavior — An empirical investigation	US	A sample of 816 firms was systematically selected from the 4701 manufacturing firms listed in the classified directory of Wisconsin Manufacture
5	Bello and Gilliland (1997)	The effect of output controls, process controls, and flexibility on export channel performance	US	A series of 20 in-depth field interviews was conducted with export executives (n=375)
6	Reuber and Fischer (1997)	The influence of management team's international experience on internationalization behaviors of SMEs	Canada	Firms to be contacted were identified from a directory of Canada's premier software product firms. The directory listed 164 firms.
7	Cooper and Kleinschmidt (1985)	The impact of export strategy on export sales performance	Canada	Managers of 142 firms in the Canadian electronics industry were personally interviewed to obtain data on export strategies and performance
8	Wiedersheim-Paul, Olson, and Welch (1978)	Pre-export activity — The first step in internationalization	Australia	The investigation involved a survey of 75 Australian manufacturing firms in five different city locations.
9	Cavusgil (1984b)	Organizational characteristics associated with export activity	US	A total of 816 companies had been systematically selected from the 4,701 companies listed in the classified directory of manufacturers in Wisconsin, U.S.A.
10	Cavusgil, Zou, and Naidu (1993)	Product and promotion adaptation in export ventures — An empirical investigation	US	In-depth personal interviews were conducted in the midwestern United States (Illinois, Indiana, Michigan, Ohio, and Wisconsin) (n=202)
11	Dichtl, Koglmayr, and Muller (1990)	International orientation as a precondition for export success	Germany	104 firms (interviews to managers)
12	Cavusgil and Naor (1987)	Firm and management characteristics as discriminators of export marketing activity	US	The sampling frame consisted of 795 firms listed in the 1978 Maine Marketing Directory
13	Simpson and Kujawa (1974)	The export decision process: An empirical inquiry	UK	The sample was drawn from the 2047 units selected from a random stratified procedure from the UK manufacturing firms
14	Denis and Depelteau (1985)	Market knowledge diversification and export expansion	Canada	The researchers had access to a data bank of 331 small and middle-sized manufacturing firms located in the province of Quebec
15	Madsen (1989)	Successful export marketing management: Some empirical evidence	Denmark	A total of 82 manufacturing firms have participated in the survey
16	Reid (1984)	Information acquisition and export entry decision in small firms	Canada	89 small indigenous enterprises in Ontario

Source: Leonidou et al. (2010). The "sample" column was added by this paper.

Table 2A: **Annual average descriptive statistics – big exporting firms and other exporting firms (2006 -2014)**

Variable	Big exporting firms	Other exporting firms
Simple average exported value per firm (real USD Dollars)	7,824,707	2,722,473
Median exported value per firm (real USD Dollars)	185,726	16,971
Avg exports HHI per firm	0.538	0.754
Median exports HHI per firm	0.483	0.988
Average number of exported products per firm	7.66	3.46
Median number of exported products per firm	3.00	1.00
Average number of country destinations per firm	4.55	1.86
Median number of country destinations per firm	2.00	1.00
Average number of product - country destinations per firm	17.73	5.34
Median number of product - country destinations per firm	4.89	1.33
Average number of firms	3489	7302

Source: Colombian National Administrative Statistics Department (DANE by the acronym in Spanish), Colombian Companies Superintendence and own calculations. The exported value variable was deflated based on the US GDP deflator.

Table 3A: **Annual average descriptive statistics – big exporting firms and big not exporting firms (2006 -2014)**

Variable	Big exporting firms	Big no exporting firms
Simple average Property Plant Equipment (real USD dollars) per firm	27,630,545,928,192	5,114,459,848,704
Median Property Plant Equipment (real USD dollars) per firm	1,930,389,487,616	590,403,928,064
Simple average Non-tangible assets (real USD dollars) per firm	3,689,790,308,352	1,193,829,728,256
Median Non-tangible assets (real USD dollars) per firm	0	0
Simple average operating expenses (real USD dollars) per firm	10,695,115,538,432	2,719,801,147,392
Median operating expenses (real USD dollars) per firm	2,333,625,548,800	733,620,600,832
Average number of firms	3,489	20,751

Source: Colombian Companies Superintendence and own calculations. The variables used in this dataset were deflated using an industrial-specific annual Producer Price Index (PPI) reported by the Colombian Central Bank.

***Table 4A:* TFP estimation**

	Prodest (*Mollisi and Rovigatti, 2017)*	***Fixed effects***
	(1)	(2)
VARIABLES	Log real operating income (USD)	Log real operating income (USD)
Log real stock property, plant and equipment (real USD)	0.154***	0.106***
	(0.00459)	(0.00522)
Log real sales cost (real USD)	0.350***	0.371***
	(0.00635)	(0.00630)
Log real operating expenses (real USD)	0.402***	0.247***
	(0.00884)	(0.00702)
Observations	238,905	233,025

*** p<0.01, ** p<0.05, * p<0.1

Source: Column (1) calculates TFP based on the algorithm and the Stata command (prodest) proposed by Mollisi and Rovigatti (2017). Their methodology implements dynamic panel data instruments a la Wooldridge, which strengthens the robustness and efficiency of estimates. Column (2) calculates the TFP as the residual of the production function regression including firm and time fixed effects.

***Table 5A:* Descriptive statistics firm-level variables included in the regression**

Variable	Mean	Median	Standard Deviation	Min	Max	N
International managerial quality, 1	0.018	-0.005	0.745	-7.093	7.488	26,323
International managerial quality, 2	0.005	0.000	0.411	-5.088	4.844	22,769
International managerial quality, 3	0.004	0.000	0.363	-4.349	4.349	21,797
International managerial quality, 4	0.002	0.000	0.337	-3.807	3.532	19,671
Log real exported value (real USD)	12.12	12.10	2.83	0.10	21.93	31,089
Log number exported products	1.602	1.386	0.907	0.693	5.889	31,089
Log no. country destination exports	1.385	1.099	0.737	0.693	4.043	31,089
Log no. products-destinations exports	2.020	1.792	1.183	0.693	7.031	31,089
HHI exports by firm	0.536	0.479	0.328	0.015	1	31,089
Profit rate (operating profit / operating income)	0.047	0.051	0.116	-0.998	1	31,089
Log unit value imports	5.540	5.939	2.726	0.000	14	24,767
Exported value / operating income	0.360	0.200	0.364	0.001	1	31,089
Log GDI products exported by firm (weighted avg, p-k share t=0)	13.322	16.347	7.955	0.000	27	31,089
Log Real Stock Property Plant, Equipment (real USD)	27.969	28.288	3.889	0	38.101	31,089
Log Real stock non-tangible assets (real USD)	10.080	0.000	12.951	0	36.072	31,089
Log Real operating expenses (real USD)	28.412	28.447	2.574	0	35.964	31,089
TFP (excluding international managerial quality 1 component)	3.97E-12	-0.0907006	1.120618	-29.36651	15.40203	26323
TFP (excluding international managerial quality 2 component)	9.74E-11	-0.094051	1.026065	-24.08617	15.36446	22769
TFP (excluding international managerial quality 3 component)	2.07E-10	-0.0916318	1.015837	-24.09687	15.36632	21797
TFP (excluding international managerial quality 4 component)	-4.37E-11	-0.0925437	0.9672185	-20.82387	15.38439	19671

***Table 6A*: Import unit value regression**

VARIABLES	(1) Log Import Unit Value
Log real stock Non-tangible assets (USD)	-8.75e-05
	(0.000130)
Log real stock Property, plant and equipment (USD)	0.00313***
	(0.000981)
Log real operating expenses (USD)	0.00848***
	(0.00205)
TFP	0.0227***
	(0.00529)
Mark up (operating income / sales cost)	-8.14e-10
	(1.69e-09)
Number of products – origin countries	2.03e-06
	(1.65e-05)
Number of origin countries	0.000450
	(0.000388)
Number of imported products	-0.000308***
	(4.74e-05)
Observations	1,707,320
R-squared	0.928
Country origin fixed effects	Yes
Product fixed effects	Yes
Year fixed effects	Yes
Firm fixed effects	Yes
Product-firm fixed effects	Yes
Product-origin fixed effects	Yes
Product-year fixed effects	Yes
Origin-year fixed effects	Yes
Firm-origin fixed effects	Yes
Product-firm-origin fixed effects	Yes
Product-year-origin fixed effects	Yes

Robust standard errors in parentheses clustered at origin country – year level in parenthesis.

*** p<0.01, ** p<0.05, * p<0.1

Table 7A: **International managerial quality 1 impact on firm's performance**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Log exported value	Log No. exported products	Log No. destination countries	Log No. products-destination countries	HHI exports (product - destination level)	Profit rate	Log average unit value imported products	Total equity (P*)
International managerial quality 1	0.0738***	-0.0358***	-0.00514	-0.0389***	0.00660***	0.00123	0.0277*	-0.00192
	(0.0184)	(0.00571)	(0.00318)	(0.00628)	(0.00243)	(0.000968)	(0.0156)	(0.00466)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0238***	0.0145***	0.00810***	0.0177***	-0.00530***	1.62e-06	0.00557*	0.000319
	(0.00329)	(0.00103)	(0.000653)	(0.00118)	(0.000452)	(0.000149)	(0.00299)	(0.000808)
Log real stock property, plant and equipment (USD)	0.0809***	0.0136***	0.0160***	0.0238***	-0.00415***	0.00616***	0.0842***	0.0520***
	(0.0195)	(0.00416)	(0.00323)	(0.00576)	(0.00123)	(0.00153)	(0.0227)	(0.00919)
Log real stock non-tangible assets (USD)	0.00367***	0.00134***	0.00101***	0.00166***	-0.000255	-2.30e-05	0.00272	0.00317***
	(0.00127)	(0.000487)	(0.000317)	(0.000556)	(0.000186)	(7.69e-05)	(0.00171)	(0.000496)
Log real operating expenses (USD)	0.211***	0.0380***	0.0352***	0.0606***	-0.0105***	0.0103**	0.132**	0.0866***
	(0.0537)	(0.0116)	(0.00851)	(0.0157)	(0.00273)	(0.00446)	(0.0623)	(0.0242)
TFP (excluding int managerial quality component)	0.475***	0.0787***	0.0705***	0.125***	-0.0249***	0.0339***	0.309*	0.163**
	(0.140)	(0.0284)	(0.0220)	(0.0402)	(0.00695)	(0.0107)	(0.167)	(0.0635)
Observations	25,382	25,382	25,382	25,382	25,382	25,382	20,420	24,806
R-squared	0.857	0.837	0.882	0.877	0.730	0.594	0.702	0.964
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial quality component) is the residual of a regression of TFP on international managerial quality 1 (no controls, no fixed effects).

*** p<0.01, ** p<0.05, * p<0.1

Table 8A: **International managerial quality 2 impact on firm's performance**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 2	0.0459*	-0.0405***	-0.00488	-0.0434***	0.00286	0.00190	-0.00470	-0.00764
	(0.0259)	(0.00880)	(0.00522)	(0.00993)	(0.00378)	(0.00174)	(0.0304)	(0.0108)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0351***	0.0235***	0.0147***	0.0299***	-0.00864***	-3.76e-05	0.00783*	0.00131
	(0.00431)	(0.00141)	(0.00106)	(0.00171)	(0.000611)	(0.000209)	(0.00421)	(0.00122)
Log real stock property, plant and equipment (USD)	0.113***	0.0189***	0.0200***	0.0318***	-0.00520***	0.00732***	0.116***	0.0586***
	(0.0237)	(0.00586)	(0.00440)	(0.00801)	(0.00134)	(0.00229)	(0.0148)	(0.0135)
Log real stock non-tangible assets (USD)	0.00394***	0.00141***	0.000983***	0.00163***	-0.000225	-3.32e-05	0.00231	0.00304***
	(0.00116)	(0.000510)	(0.000333)	(0.000578)	(0.000182)	(7.96e-05)	(0.00183)	(0.000522)
Log real operating expenses (USD)	0.281***	0.0476***	0.0452***	0.0776***	-0.0120***	0.0135*	0.243***	0.103***
	(0.0774)	(0.0176)	(0.0131)	(0.0241)	(0.00304)	(0.00713)	(0.0365)	(0.0388)
TFP (excluding int managerial component)	0.682***	0.108**	0.0990***	0.175***	-0.0298***	0.0446***	0.611***	0.217**
	(0.182)	(0.0426)	(0.0324)	(0.0594)	(0.00774)	(0.0172)	(0.0880)	(0.101)
Observations	22,373	22,373	22,373	22,373	22,373	22,373	17,936	21,878
R-squared	0.883	0.854	0.886	0.887	0.743	0.591	0.697	0.965
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial component) is the residual of a regression of TFP on international managerial quality 2 (no controls, no fixed effects).

*** p<0.01, ** p<0.05, * p<0.1

Table 9A: **International managerial quality 3 impact on firm's performance**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 3	0.0538*	-0.0311***	-0.00185	-0.0330***	0.00447	0.00167	-0.0223	-0.00416
	(0.0283)	(0.00920)	(0.00570)	(0.0104)	(0.00422)	(0.00202)	(0.0355)	(0.0109)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0377***	0.0251***	0.0160***	0.0322***	-0.00886***	1.86e-05	0.0121***	0.00127
	(0.00452)	(0.00153)	(0.00119)	(0.00189)	(0.000657)	(0.000221)	(0.00445)	(0.00126)
Log real stock property, plant and equipment (USD)	0.114***	0.0193***	0.0204***	0.0326***	-0.00515***	0.00702***	0.117***	0.0587***
	(0.0245)	(0.00594)	(0.00449)	(0.00814)	(0.00134)	(0.00236)	(0.0155)	(0.0133)
Log real stock non-tangible assets (USD)	0.00318***	0.00127**	0.000844**	0.00144**	-0.000175	-9.33e-06	0.00244	0.00282***
	(0.00113)	(0.000514)	(0.000340)	(0.000583)	(0.000182)	(7.89e-05)	(0.00185)	(0.000522)
Log real operating expenses (USD)	0.280***	0.0478***	0.0452***	0.0782***	-0.0120***	0.0130*	0.240***	0.103***
	(0.0807)	(0.0182)	(0.0135)	(0.0250)	(0.00310)	(0.00735)	(0.0384)	(0.0388)
TFP (excluding int managerial component)	0.685***	0.109**	0.101***	0.178***	-0.0308***	0.0437**	0.610***	0.216**
	(0.191)	(0.0439)	(0.0333)	(0.0613)	(0.00783)	(0.0179)	(0.0929)	(0.100)
Observations	21,558	21,558	21,558	21,558	21,558	21,558	17,295	21,100
R-squared	0.889	0.858	0.887	0.889	0.746	0.590	0.698	0.965
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial component) is the residual of a regression of TFP on international managerial quality 3 (no controls, no fixed effects).

*** p<0.01, ** p<0.05, * p<0.1

Table 10A: **International managerial quality 4 impact on firm's performance (EUV residuals aggregated by the simple average)**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 4	0.0474*	-0.0212**	0.00288	-0.0245**	0.00447	0.00360*	-0.0195	-0.0116
	(0.0255)	(0.00903)	(0.00616)	(0.0101)	(0.00426)	(0.00199)	(0.0417)	(0.00824)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0380***	0.0278***	0.0194***	0.0369***	-0.00961***	-0.000178	0.0122**	0.00167
	(0.00523)	(0.00182)	(0.00142)	(0.00228)	(0.000780)	(0.000273)	(0.00519)	(0.00145)
Log real stock property, plant and equipment (USD)	0.118***	0.0229***	0.0215***	0.0369***	-0.00467***	0.00837***	0.131***	0.0680***
	(0.0316)	(0.00750)	(0.00556)	(0.0103)	(0.00136)	(0.00307)	(0.0155)	(0.0163)
Log real stock non-tangible assets (USD)	0.00292**	0.00147***	0.000876**	0.00153**	-0.000286	8.36e-06	0.00147	0.00251***
	(0.00115)	(0.000531)	(0.000353)	(0.000601)	(0.000186)	(7.88e-05)	(0.00193)	(0.000533)
Log real operating expenses (USD)	0.282***	0.0536**	0.0507***	0.0879***	-0.0128***	0.0155	0.285***	0.127**
	(0.101)	(0.0235)	(0.0172)	(0.0324)	(0.00313)	(0.00968)	(0.0366)	(0.0508)
TFP (excluding int managerial component)	0.708***	0.124**	0.112***	0.203***	-0.0312***	0.0515**	0.703***	0.296**
	(0.246)	(0.0567)	(0.0418)	(0.0783)	(0.00755)	(0.0235)	(0.0897)	(0.123)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.901	0.870	0.895	0.898	0.762	0.592	0.698	0.968
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial component) is the residual of a regression of TFP on international managerial quality 4 (no controls, no fixed effects). EUV: Export Unit Value

*** p<0.01, ** p<0.05, * p<0.1

Table 11A: **International managerial quality 4 impact on firm's performance (EUV residuals aggregated by the simple average and multiplied by the export value share relative to operating income)**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 4	0.187***	-0.0292*	0.0209*	-0.0169	-0.00193	0.00163	-0.0325	-0.00572
	(0.0657)	(0.0171)	(0.0118)	(0.0203)	(0.00941)	(0.00430)	(0.105)	(0.0168)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0382***	0.0278***	0.0194***	0.0369***	-0.00962***	-0.000181	0.0122**	0.00169
	(0.00523)	(0.00182)	(0.00142)	(0.00228)	(0.000780)	(0.000274)	(0.00519)	(0.00145)
Log real stock property, plant and equipment (USD)	0.118***	0.0229***	0.0214***	0.0369***	-0.00466***	0.00837***	0.131***	0.0680***
	(0.0316)	(0.00749)	(0.00556)	(0.0102)	(0.00136)	(0.00307)	(0.0155)	(0.0163)
Log real stock non-tangible assets (USD)	0.00288**	0.00147***	0.000871**	0.00152**	-0.000284	8.72e-06	0.00147	0.00250***
	(0.00115)	(0.000531)	(0.000353)	(0.000602)	(0.000186)	(7.88e-05)	(0.00193)	(0.000533)
Log real operating expenses (USD)	0.282***	0.0536**	0.0506***	0.0879***	-0.0128***	0.0155	0.285***	0.127**
	(0.101)	(0.0235)	(0.0172)	(0.0323)	(0.00312)	(0.00969)	(0.0366)	(0.0508)
TFP (excluding int managerial component)	0.708***	0.124**	0.112***	0.203***	-0.0312***	0.0515**	0.703***	0.296**
	(0.245)	(0.0566)	(0.0418)	(0.0782)	(0.00752)	(0.0235)	(0.0897)	(0.123)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.901	0.870	0.895	0.898	0.762	0.592	0.698	0.968
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial component) is the residual of a regression of TFP on international managerial quality 4 (no controls, no fixed effects). EUV: Export Unit Value.

*** p<0.01, ** p<0.05, * p<0.1

Table 12A: **International managerial quality 4 impact on firm's performance (excluding TFP from the export unit value regression)**

VARIABLES	(1) Log exported value	(2) Log No. exported products	(3) Log No. destination countries	(4) Log No. products-destination countries	(5) HHI exports (product - destination level)	(6) Profit rate	(7) Log average unit value imported products	(8) Total equity (P*)
International managerial quality 4	0.0604**	-0.0211**	0.00427	-0.0207**	0.00370	0.00349*	-0.00316	-0.00849
	(0.0260)	(0.00913)	(0.00629)	(0.0103)	(0.00444)	(0.00197)	(0.0423)	(0.00824)
Log global import demand of products exported by firm (weighted avg p-k shares in t=0)	0.0380***	0.0278***	0.0194***	0.0369***	-0.00961***	-0.000180	0.0122**	0.00168
	(0.00523)	(0.00182)	(0.00142)	(0.00228)	(0.000780)	(0.000273)	(0.00519)	(0.00145)
Log real stock property, plant and equipment (USD)	0.118***	0.0229***	0.0215***	0.0369***	-0.00467***	0.00837***	0.131***	0.0680***
	(0.0316)	(0.00749)	(0.00556)	(0.0102)	(0.00136)	(0.00307)	(0.0155)	(0.0163)
Log real stock non-tangible assets (USD)	0.00292**	0.00147***	0.000876**	0.00153**	-0.000285	8.66e-06	0.00147	0.00251***
	(0.00115)	(0.000531)	(0.000353)	(0.000601)	(0.000185)	(7.88e-05)	(0.00193)	(0.000533)
Log real operating expenses (USD)	0.282***	0.0536**	0.0507***	0.0880***	-0.0128***	0.0155	0.285***	0.127**
	(0.101)	(0.0235)	(0.0173)	(0.0323)	(0.00313)	(0.00969)	(0.0366)	(0.0508)
TFP (excluding int management component)	0.708***	0.125**	0.112***	0.203***	-0.0313***	0.0515**	0.703***	0.296**
	(0.246)	(0.0566)	(0.0419)	(0.0782)	(0.00754)	(0.0235)	(0.0897)	(0.123)
Observations	19,532	19,532	19,532	19,532	19,532	19,532	15,628	19,116
R-squared	0.901	0.870	0.895	0.898	0.762	0.592	0.698	0.968
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects (CIIU 3 digit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses clustered at firm-level. P*: placebo test. TFP (excluding int managerial component) is the residual of a regression of TFP on international managerial quality 4 (no controls, no fixed effects).

*** p<0.01, ** p<0.05, * p<0.1

***Table 13A:* Learning by exporting regression (IMQ2)**

VARIABLES	(1) EUV Residuals	(2) EUV Residuals
International managerial quality 2, t-1	-0.0128	-0.0129
	(0.0185)	(0.0186)
Log Real Stock Non-tangible assets (USD)		-3.27e-05
		(0.000216)
Log Real Stock Property, plant and equipment (USD)		0.00184
		(0.00236)
Log Real Operational expenses (USD)		0.00413
		(0.00749)
TFP (excluding int management component)		0.0142
		(0.0172)
Observations	324,358	324,358
R-squared	0.004	0.004
Firm fixed effects	Yes	Yes
Country destination fixed effects	Yes	Yes
Product fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Robust standard errors clustered at firm-level in parentheses. The dependent variable of the regressions are the residuals calculated in the export unit value regression (see table 2) with the opposite sign for the price competition products.

*** p<0.01, ** p<0.05, * p<0.1

***Table 14A:* Learning by exporting regression (IMQ 3)**

VARIABLES	(1) EUV residuals	(2) EUV residuals
International managerial quality 3, t-1	-0.00733	-0.00739
	(0.0200)	(0.0200)
Log Real Stock Non-tangible assets (USD)		-0.000166
		(0.000210)
Log Real Stock Property, plant and equipment (USD)		0.00114
		(0.00206)
Log Real Operational expenses (USD)		0.00278
		(0.00670)
TFP (excluding int management component)		0.0103
		(0.0150)
Observations	319,344	319,344
R-squared	0.003	0.003
Firm fixed effects	Yes	Yes
Country destination fixed effects	Yes	Yes
Product fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Robust standard errors clustered at firm-level in parentheses. The dependent variable of the regressions are the residuals calculated in the export unit value regression (see table 2) with the opposite sign for the price competition products.

*** p<0.01, ** p<0.05, * p<0.1

Table 15A: **Learning by exporting regression (IMQ 4)**

VARIABLES	(1) EUV residuals	(2) EUV residuals
International managerial quality 4, t-1	-0.0324	-0.0322
	(0.0248)	(0.0248)
Log Real Stock Non-tangible assets (USD)		-0.000117
		(0.000231)
Log Real Stock Property, plant and equipment (USD)		-0.000841
		(0.00182)
Log Real Operational expenses (USD)		-0.00296
		(0.00568)
TFP (excluding int management component)		-0.00770
		(0.0127)
Observations	202,217	202,217
R-squared	0.006	0.006
Firm fixed effects	Yes	Yes
Country destination fixed effects	Yes	Yes
Product fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

Robust standard errors clustered at firm-level in parentheses. The dependent variable of the regressions are the residuals calculated in the export unit value regression (see table 2) with the opposite sign for the price competition products.

*** p<0.01, ** p<0.05, * p<0.1