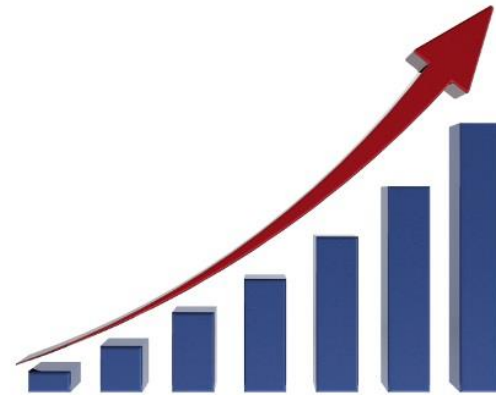# *Influence of e-commerce on sales in the manufacturing industry*

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E-commerce has grown explosively in recent years

Information and Communication Technologies

↑ Internet connection

Nevertheless, many firms do not engage transactions via e-commerce

DO MANUFACTURING COMPANIES THAT SELL THROUGH THE INTERNET INCREASE THEIR SALES?

DO MANUFACTURING COMPANIES THAT SELL THROUGH THE INTERNET IMPROVE THEIR PROFITABILITY?

E-commerce

There are many kinds of e-commerce

The most common classification is the one that differentiates e-commerce according to the different subjects that participate in the relationship (companies, consumers and public bodies)

In the present paper we focus on the B2C and B2B by the manufacturing companies

CONSUMERS

More options to choose

Greater comfort

E-commerce

What can induce companies to adopt e-commerce?

Literature review.

Size

Age of the company

Internationalization

Number of clients

Industry

E-commerce and sales

E-commerce is a chance to attract potential customers

The online channel allows firms to reach more potential customers and facilitates the buying process

Consumers consider the online channel to be more convenient

The online distribution channel activates consumers who find the online channel more appealing

Substitution between the online and traditional channels

H1: The adoption of e-commerce by manufacturing companies does not have an effect on sales

E-commerce and profitability

Cost savings:

Firms can locate in areas with low real estate costs and a low-cost workforce

Can centralize operations into a few warehouses

Do not need a network of stores

The lack of face-to-face interaction with customers reduces the need for a large workforce of salespeople

Advertising costs may be lower for e-firms

H2: The adoption of e-commerce by manufacturing companies improves their profitability

Sample

Survey on Business Strategies (Encuesta sobre Estrategias Empresariales):

Spanish manufacturing companies with 10 or more employees

Temporal scope: 2008-2015

2,544 firms

13,418 firm-year observations

Year	N. of observations	Percentage
2008	1,832	13.65
2009	1,783	13.29
2010	1,803	13.44
2011	1,807	13.47
2012	1,603	11.95
2013	1,671	12.45
2014	1,517	11.31
2015	1,402	10.45
Total	13,418	100.00

Sector breakdown

Code	Sector	N. Obs.	Percent.
sec1	Meat	513	3.82
sec2	Food and Tobacco	1,477	11.01
sec3	Beverages	302	2.25
sec4	Textiles and Clothing	846	6.30
sec5	Leather and Footwear	376	2.80
sec6	Timber	475	3.54
sec7	Paper	559	4.17
sec8	Graphic Arts	526	3.92
sec9	Chemical and Pharmaceutical Products	944	7.04
sec10	Rubber and Plastic	729	5.43
sec11	Non-Metallic Mineral Products	962	7.17
sec12	Ferrous and Non-Ferrous Metals	447	3.33
sec13	Metal Products	1,730	12.89
sec14	Agricultural and Industrial Machinery	799	5.95
sec15	Computer, Electronic and Optical Products	232	1.73
sec16	Electrical Machinery and Equipment	549	4.09
sec17	Motor vehicles	683	5.09
sec18	Other Transport Equipment	283	2.11
sec19	Furniture	639	4.76
sec20	Other Manufacturing	347	2.59
	TOTAL	13,418	100.00

Variables

Dependent:

VarSales	Percentual variation of sales w/ respect to previous year
Profitability	Commercial margin over sales

Independent:

E-commerce indicators:

B2B	1 if the firm has B2B e-commerce, 0 otherwise
B2C	1 if the firm has B2C e-commerce, 0 otherwise
B2B&B2C	1 if the firm has B2B and B2C e-commerce, 0 otherwise

Control variables: age (years), size (log sales), client concentration (sales % to 3 biggest clients), use of production capacity (%), exports (% of sales), industry (sector dummies)

Models

H1:

$$VarSales = c_1 \boldsymbol{Ecom} + c_2 Age + c_3 Sales + c_4 ClConc + c_5 UCapac + c_6 Exports + \sum_j c_j \, sec.\,dummy_j$$

H2:

$$Profitability = c_1 \boldsymbol{Ecom} + c_2 Age + c_3 Sales + c_4 ClConc + c_5 UCapac + c_6 Exports + \sum_j c_j \, sec.\,dummy_j$$

Ecom = B2B, B2C, B2B&B2C → 3 models for each hypothesis

Descriptive statistics

Continuous variables:

Variable	Mean	Std. Dev.	Q1	Median	Q3
VarSales	-0.192	84.665	-14.721	-1.832525	9.071
Profitability	5.132	65.362	1.2	6.2	12.4
Age	31.466	31.198	18	26	39
Sales	6.96e+07	3.27e+08	1,666,957	7,134,250	3.49e+07
ClConc	46.221	28.763	22	40	70
UCapac	73.636	18.784	60	75	89
Exports	23.580	29.505	0	8.165	42.582

E-commerce indicators:

E-commerce	Yes	No
B2B	1,289 (9.61%)	12,129 (90.39%)
B2C	1,076 (8.02%)	12,342 (91.98%)
B2B & B2C	621 (4.63%)	12,797 (95.37%)

Regression results (dep. var.=VarSales)

	Ecom=b2b		Ecom=b2c		Ecom=b2b&b2c	
	Coef. (std. err.)	t (p. val.)	Coef. (std. err.)	t (p. val.)	Coef. (std. err.)	t (p. val.)
Ecom	*-1.589* *(0.992)*	*-1.60* *(0.109)*	*-0.856* *(0.898)*	*-0.95* *(0.341)*	*-1.263* *(1.063)*	*-1.19* *(0.235)*
Age	-0.021 (0.009)	-2.36 (0.018)	-0.021 (0.009)	-2.38 (0.017)	-0.021 (0.009)	-2.40 (0.017)
Lsales	1.881 (0.217)	8.66 (0.000)	1.846 (0.213)	8.64 (0.000)	1.848 (0.213)	8.66 (0.000)
ClConc	0.042 (0.010)	4.14 (0.000)	0.043 (0.010)	4.21 (0.000)	0.043 (0.010)	4.24 (0.000)
Capac	0.291 (0.018)	15.80 (0.000)	0.292 (0.018)	15.85 (0.000)	0.292 (0.018)	15.85 (0.000)
Exports	0.038 (0.017)	2.17 (0.030)	0.038 (0.017)	2.18 (0.029)	0.038 (0.017)	2.18 (0.030)
S dum.	…	…	…	…	…	…
Inter-cept	-56.200 (3.267)	-17.20 (0.000)	-55.875 (3.234)	-17.28 (0.000)	-55.900 (3.236)	-17.27 (0.000)
F	28.53 ($p<0.001$)		28.82 ($p<0.001$)		28.61 ($p<0.001$)	
R-sq.	0.0551		0.0550		0.0550	
Clust.	2544		2544		2544	
N	13417		13417		13417	

Regression results (dep. var.=Profitability)

	Ecom=b2b		Ecom=b2c		Ecom=b2b&b2c	
	Coef. (std. err.)	t (p. val.)	Coef. (std. err.)	t (p. val.)	Coef. (std. err.)	t (p. val.)
Ecom	*1.306 (0.894)*	*1.46 (0.144)*	*1.224 (0.687)*	*1.78 (0.075)*	*2.012 (0.831)*	*2.42 (0.016)*
Age	-0.016 (0.012)	-1.29 (0.198)	-0.016 (0.012)	-1.29 (0.199)	-0.016 (0.012)	-1.28 (0.201)
Lsales	0.641 (0.993)	0.65 (0.519)	0.666 (0.980)	0.68 (0.497)	0.662 (0.980)	0.68 (0.500)
Clconc	0.025 (0.031)	0.82 (0.411)	0.025 (0.031)	0.82 (0.413)	0.025 (0.031)	0.82 (0.413)
Capac	0.086 (0.094)	0.92 (0.359)	0.085 (0.095)	0.90 (0.366)	0.086 (0.095)	0.91 (0.365)
Exports	0.010 (0.024)	0.45 (0.651)	0.010 (0.024)	0.44 (0.659)	0.010 (0.024)	0.44 (0.658)
S dum.	…	…	…	…	…	…
Inter-cept	-11.048 (22.869)	-0.48 (0.629)	-11.300 (22.748)	-0.50 (0.619)	-11.256 (22.752)	-0.49 (0.621)
F	7.31 ($p<0.001$)		7.10 ($p<0.001$)		7.17 ($p<0.001$)	
R-sq.	0.004		0.004		0.004	
Clust.	2544		2544		2544	
N	13418		13418		13418	

Conclusions

H1 fully supported:

Adoption of e-commerce by manufacturing companies does not have an effect on sales growth

H2 partially supported:

Only the companies which simultaneously engage in both B2B and B2C increase their profitability

Future research lines

Study of the effect on Sales & Profitability of:
- N. of Years of experience with E-commerce
- Quality of web application and security issues

Study of the effect of E-commerce on the n. of phys. units sold